June 1992
Revision 1.0

RCRA Part B Permit Application

Surface Impoundments
Technical Area 53

Los Alamos National Laboratory
Environmental Protection Group EM-8
Los Alamos, New Mexico, 87545

4276

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1.0 INTRODUCTION

This application is submitted to the New Mexico Environment Department (NMED) and the Environmental Protection Agency (EPA) to meet the requirements of the Resource Conservation and Recovery Act (RCRA) for a Part B Permit Application. This permit application addresses only storage of possible mixed waste in the surface impoundments located at Technical Area (TA) 53. These impoundments were identified as mixed waste storage units in the RCRA Part A Permit Application for mixed waste submitted to the NMED on January 25, 1991. Mixed waste contains both a hazardous waste, as defined by and regulated under RCRA, and radioactive waste. The mixed waste in the sludge deposited at the bottoms of the impoundments may include metals, organic compounds, and low-level radionuclides.

~~The format of the Part B application generally follows an outline provided in "A Guide for Preparing RCRA Permit Applications for Existing Storage Facilities", U.S. EPA, 1982.~~ An outline of the permit application with citations of the regulations covered by each section is given ~~shown~~ in Table 1-1. The New Mexico Hazardous Waste Management Regulations-6 (HWMR-6) has incorporated the 1990 Code of Federal Regulations (CFR), Title 40, Parts 260-270; thus, all regulatory citations in this application will be referenced to the 1990 40 CFR.

Los Alamos National Laboratory (LANL) was issued a Hazardous Waste Facility (HWF) Permit (Permit Number NM 0890010515-1) by the NMED on November 8, 1989, for hazardous waste management. ~~The general permitting requirements applicable to hazardous waste management units are identical to those for mixed waste units; thus, this permit application references those sections of the operating permit in lieu of resubmitting the information.~~ Portions of the general facility information contained in Section 2.0 of this application were ~~was~~ extracted from Volume

1, Revision 4.1, RCRA Part B Permit Application, November 1988, for Los Alamos National Laboratory.

LANL is a multidisciplinary laboratory. The mission of LANL is the application of science and technology to solve national problems including weapons development, energy supply, and conservation programs, while basic scientific research complements and strengthens its fundamental technical capabilities. LANL is owned by the U.S. Department of Energy (DOE), and co-operated by DOE and the University of California.

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SECTION	RCRA REGULATORY REFERENCE[1]
1.0 INTRODUCTION	
2.0 FACILITY DESCRIPTION	
2.1 GENERAL DESCRIPTION	270.14(b)(1), 270.14(b)(19), 270.14(d)(1)
2.2 LOCATION INFORMATION	270.14(b)(11), 270.14(b)(19), 270.14(c)(3), 270.14(d)(1), 264.18(a)(b)
2.3 TRAFFIC PATTERNS	270.14(b)(10)
3.0 WASTE CHARACTERIZATION	270.14(b)(2) & (3), 264.13
3.1 SAMPLING AND ANALYSIS STRATEGY	
3.2 SAMPLING PROCEDURES	
3.3 ANALYTICAL REQUIREMENTS	
3.4 QUALITY ASSURANCE/QUALITY CONTROL	
3.5 VARIANCES, NONCONFORMANCES, AND CORRECTIVE ACTIONS	
4.0 WASTE MANAGEMENT PRACTICES	270.17(b)&(d), 264.221
4.1 SURFACE IMPOUNDMENTS TA-53-166 NORTHWEST AND NORTHEAST	
4.2 SURFACE IMPOUNDMENT TA-53-166 SOUTH	
4.3 SURFACE IMPOUNDMENT OPERATION AND MAINTENANCE	
4.4 EXISTING MONITORING SYSTEMS	
4.5 CERTIFICATION	264.226(c)
5.0 GROUND-WATER MONITORING PROGRAM	270.14(c)(1),(2),(3),(5) & (6), 264.90(b)(4)
6.0 PROCEDURES TO PREVENT HAZARDS	
6.1 SECURITY	264.14(b)(c), 270.14(b)(4)
6.~~1~~ 2 INSPECTION SCHEDULES AND REQUIREMENTS	270.14(b)(4)&(5), 264.14, 264.15, 264.33, 270.17(c), 264.226(b)
6.~~2~~ 3 INSPECTION RECORDS	264.15
6.~~3~~ 4 REMEDIAL ACTIONS	264.15, 264.227
6.~~4~~ 5 PREPAREDNESS AND PREVENTION REQUIREMENTS	270.14(b)(9), 264 Subpart C
6.~~5~~ 6 PREVENTATIVE PROCEDURES AND EQUIPMENT	270.14(b)(8)

[1]From Code of Federal Regulations, Title 40, 1990.

TABLE 1-1

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7.0	~~HAZARDOUS WASTE FACILITY~~ CONTINGENCY PLAN FOR MIXED WASTE UNITS*		270.14 (b)(7), 264 Subpart D
	7.1	INTRODUCTION	
	7.2	~~HAZARDOUS~~ MIXED WASTE EMERGENCY RESPONSE RESOURCES	264.37, 264.52
	7.3	NONSUDDEN RELEASES	264.227
	7.4	SUDDEN RELEASES	264.51, 264.52(a), 264.227
	7.5	SPECIFIC EMERGENCY RESPONSE PROCEDURES FOR MIXED ~~HAZARDOUS~~ WASTE UNITS	264.56
	7.6	EVACUATION	264.52(f)
	7.7	SALVAGE AND CLEANUP	264.56
	7.8	POST-EMERGENCY ASSESSMENT	264.56
	7.9	EMERGENCY RESPONSE RECORDS	264.56
	7.10	EMERGENCY REPORTS	264.56
	7.11	CONTINGENCY PLAN AMENDMENT	264.54

*(The Contingency Plan for Mixed Waste Units is included as Appendix H)

8.0	PERSONNEL TRAINING (Personnel Training Plan is included as Appendix I)		270.14(b)(12), 264.16
9.0	CLOSURE AND POST-CLOSURE PLAN		270.14(b)(13), 264.111, 264.112, 264.228(a)
	9.1	INTRODUCTION	
	9.2	CLOSURE PROCEDURES AND DECONTAMINATION	264.114, 264.228(a)
	9.3	SAMPLING AND ANALYTICAL PROCEDURES	
	9.4	DECONTAMINATION VERIFICATION	264.114
	9.5	CLOSURE SCHEDULE	264.113
	9.6	CLOSURE CERTIFICATION	264.115
	9.7	QUALITY ASSURANCE/ QUALITY CONTROL	
	9.8	FINAL CLOSURE REPORT	264.115
	9.9	POST-CLOSURE PLAN	264.117 through 120 (if applicable)
10.0	CERTIFICATION		270.11

2.0 FACILITY DESCRIPTION

2.1 GENERAL DESCRIPTION

LANL is located in Los Alamos County in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. The regional location of LANL is shown on Figure 2-1. LANL, which occupies an area of 43 square miles, and the associated residential areas of Los Alamos and White Rock are situated on the Pajarito Plateau. The plateau consists of a series of finger-like mesas separated by deep east-west trending canyons; intermittent streams lie at the bottoms of all of the canyons. The mesa tops range in elevation from approximately 7,800 feet at the flank of the Jemez Mountains (located to the west of Los Alamos) to about 6,200 feet at their eastern extent where they terminate above the Rio Grande Valley.

LANL is divided into 51 TAs; 34 of these TAs are developed (Figure 2-2). ~~RCRA regulated waste can be generated in many of these areas; however, the only waste management units addressed in this permit application are the surface impoundments at TA-53.~~ The waste management units addressed in this permit application are in TA-53. Units that are permitted for hazardous waste treatment and storage or have interim status for mixed waste treatment and storage are located in eleven other TAs, as indicated on Figure 2-2. Specifically, hazardous waste treatment and storage units are located at TA-54 Area L, TA-50-1 (batch waste treatment facility), TA-50-37 (controlled air incinerator), and TA-16 (incinerator). There are also high explosive (HE) open burning/open detonation units operating under interim status at TAs-14, -15, -16, -36, and -39. One interim status HE treatment unit, the Scrap Detonation Site (SDS) at TA-40, is scheduled for RCRA closure. Mixed waste storage units are located at TAs-3, -16, -21, -50, -54, and -55. Mixed waste treatment occurs at TA-50-37 (controlled air incinerator), TA-50-1 and TA-55-4

(cementation processes), TA-55-4 (oxygen sparging furnace), and HE mixed waste detonation sites at TA-36 and TA-15. Maps providing specific locations of these units are referenced in Section 2.1.2.

There is a centralized decontamination area at TA-50 which is used for cleanup of equipment associated with hazardous and mixed waste operations. The location of the decontamination area is the south wing of Room 34, Building 1, in TA-50. The area is a high bay which can accommodate equipment of all sizes, including vehicles. TA-50 Building 1 is shown on the maps referenced for TA-50 in Section 2.1.2.

2.1.1 TA-53 Surface Impoundments

The three surface impoundments located in TA-53 are collectively identified with LANL Structure No. TA-53-166; in this document, the three impoundments will be distinguished as TA-53-166 Northeast (NE), TA-53-166 Northwest (NW), and TA-53-166 South (S) (Figure 2-3). The largest impoundment, TA-53-166 S, was constructed in 1985. It is approximately 305 feet in length by 148 feet in width and is 6 feet deep. It is lined with Hypalon (36 mil thick) and has a liquid storage capacity of 2,580,000 gallons. The two north surface impoundments, constructed in 1969, are 210 feet in length by 210 feet in width and are 6 feet deep. Both have Gunite sides and bentonite clay bottoms. The north impoundments have liquid storage capacities of 1,629,144 gallons each. The three surface impoundments, which are all currently in operation, may contain mixed waste in the sludge deposited at the bottoms of the impoundments. The mixed waste may include metals, organic compounds, and low-level radionuclides. Sections 3.0 and 4.0 of this document describe waste characterization and waste management practices, respectively, for the TA-53 surface impoundments.

2.1.2 Topographic Maps

The TA-53 surface impoundments are shown on ~~in~~ Figure 2-3. Contour lines on this figure are in intervals of ten feet, which are sufficient to detail natural drainage in the vicinity of the surface impoundments. The legal boundaries of LANL are presented on ~~in~~ Figure 2-4. Figures 2-3 and 2-4 are topographic maps at scales of 1″ = 400′ and 1″ = 2,500′, respectively. As provided in 40 CFR 270.14(b)(19), LANL requests that the NMED accept the maps at these scales due to the size of the waste management units and the area of LANL.

Topographic maps showing the locations of all hazardous and mixed waste units are provided in the RCRA Part B Permit Application, Revision 4.1, November 1988 (for hazardous waste units), and the RCRA Part A Permit Application submitted in January 1991 (for mixed waste units). Specifically, the following maps in the RCRA Part B provide locations of the hazardous waste units:

• Figure 2, Section 1	Contour Map Showing TA-54 Area L Treatment Tanks and Storage Areas
• Figure 8, Section 1	Contour Map Showing the Locations of the TA-50 Batch Treatment System, Container Storage, and Controlled Air Incinerator
• Figure 15, Section 1	Contour Map Showing Location of TA-16 Open Burning Unit and Incinerator
• Figure 20, Section 1	Contour Map Showing Location of TA-14 Firing Point
• Figure 21, Section 1	Contour Map Showing Location of TA-36 Firing Point
• Figure 22, Section 1	Contour Map Showing Location of TA-39 Firing Points

In the RCRA Part A, all mixed waste units are shown on the series of contour maps designated Maps 1 through 8.

2.1.3 Wells

The municipal and industrial water supply for LANL and the surrounding community is from 15 deep wells in three well fields and one gallery (industrial use). The wells are located on the Pajarito Plateau and in canyons east of LANL. Water is pumped from the main aquifer, the surface of which ranges from approximately 850 to 1,150 feet below the surface of the plateau. The gallery collects spring discharge from a perched water zone in the volcanics on the flanks of the mountains located west of Los Alamos. The locations of supply wells and the gallery, as well as the locations of test wells, springs, observation holes, and surface water sampling stations are shown on Figure 2-5. Surface water on LANL property is limited to intermittent streams in the canyon bottoms. The volume of water flow in these streams is generally dependent upon storm runoff, snow melt, and National Pollutant Discharge Elimination System (NPDES) - permitted effluent. Surface, well, and spring waters are routinely sampled and analyzed for radionuclides as well as heavy metals, fluorides, nitrates, carbonates, bicarbonates, silica, sodium, magnesium, and conductivity. Analytical results are published annually by the Los Alamos Environmental Protection Group, Environmental Management 8 ~~2~~ (EM-8 ~~2~~), formerly Health, Safety, and Environment 8 (HSE-8). Copies of this publication are submitted annually to the NMED and the EPA Regional Administrator.

Los Alamos National Laboratory has one injection well at TA-57, the Fenton Hill Geothermal Site, approximately 20 air miles west of Los Alamos. It is permitted for geothermal discharge through an NPDES outfall, NPDES Serial No. 001 (Figure 2-6).

~~There is one injection well in the vicinity of Los Alamos. This well is located in TA-57 (the Fenton Hill Site) and discharges through a National Pollutant Discharge Elimination System (NPDES) outfall, NPDES Serial No. 001 (Figure 2-6).~~

2.1.4 Wind Rose

Surface winds are light at Los Alamos, averaging 7 miles per hour (mph), or 3 meters per second (m/s). Wind speeds are strongest from March through May and weakest in December and January. The strongest winds are generally southwesterly to northwesterly and occur in the afternoon or evening. Night winds are usually west-northwesterly at the western edge of the Pajarito Plateau because of persistent cold air drainage down the plateau. Daytime winds are generally southeasterly to southwesterly, caused by upslope and up-valley winds, but daytime winds are also frequently westerly during the windy season, March through May.

Mean, annually-averaged wind directions are plotted in wind roses at four sites on Figure 2-7. A wind rose is a circle with bars extending from the center representing the direction from which the wind blows. As indicated on the drawing legend, open bars represent daytime and dark bars represent nighttime. Day and night are defined by the times of sunrise and sunset. The length of each bar is proportional to the wind direction frequency. Each direction is 1 of 16 primary compass points (for example, N, NNE, etc.) and is centered on a 22.5°-wide sector. The wind directions were taken at a height above ground of about 36 feet (11 m) at four sites: TA-50, East Gate, Bandelier, and TA-54. The wind direction at 300 feet (92 m) is also given for TA-50; the wind rose for this height is in the far upper-right of Figure 2-7. The numbers in the center of each wind rose represent the percent frequency of calm winds; i.e., winds less than 1 mph. The wind

rose at the East Gate location most closely represents conditions at TA-53 since East Gate is the closest data collection point to TA-53.

Because of the complex terrain, Los Alamos surface winds often vary dramatically with time of day, location, and height above ground. On sunny days, thermally-driven (convective) upslope winds develop over the Pajarito Plateau. Upslope winds are generally light, less than 6 mph (3 m/s). Winds usually become more south-southwesterly and southerly at locations toward the Rio Grande Valley, where a larger-scale, thermally-driven, up-valley wind predominates.

When sky conditions are clear and large-scale winds are light, locally-produced winds reverse at night. At sunset, shallow drainage winds from the north to the northwest flow down the plateau, especially near the Jemez Mountains and in other areas with a greater slope. These winds can reach speeds of 6-8 mph (3-3.5 m/s).

~~An annual wind rose (1983 data) for TA-59, which is located approximately three miles west of TA-53, is shown in Figure 2-7. The irregular terrain at Los Alamos produces a distinct daily wind pattern. At night, winds tend to flow down the Pajarito Plateau, generally out of the northwest and west northwest in a southwesterly direction. During the day, the pattern reverses and light, up-slope winds flow predominantly from the southeast and south-southeast. Los Alamos is generally a light wind site with an annual average wind speed of 2.8 meters per second. Only 12 percent of wind speeds in 1983 were greater than five meters per second and 38 percent were less than 2.5 meters per second.~~

2.1.5 Land Use

The communities located closest to LANL are Los Alamos, located just north of LANL, and White Rock, located east-southeast of LANL (Figure 2-1). The total population of Los Alamos County is approximately 19,000. Most of Los Alamos County, as well as adjoining portions of neighboring Sandoval, Rio Arriba, and Santa Fe Counties, is undeveloped. The only significant developments in Los Alamos County are the LANL facilities and the associated residential communities. Large tracts of land in the Jemez Mountains, which lie to the north, west, and south of Los Alamos, are held by the U.S. Forest Service and the National Park Service. This land is largely occupied by pine, fir, and aspen forests. Agriculture in the vicinity of LANL is limited to home gardens and some cattle grazing. In the river valleys to the east, agriculture is limited to the cultivation of relatively small, irrigated plots. Primary crops are corn, chili, tree fruits, and alfalfa.

2.2 LOCATION INFORMATION

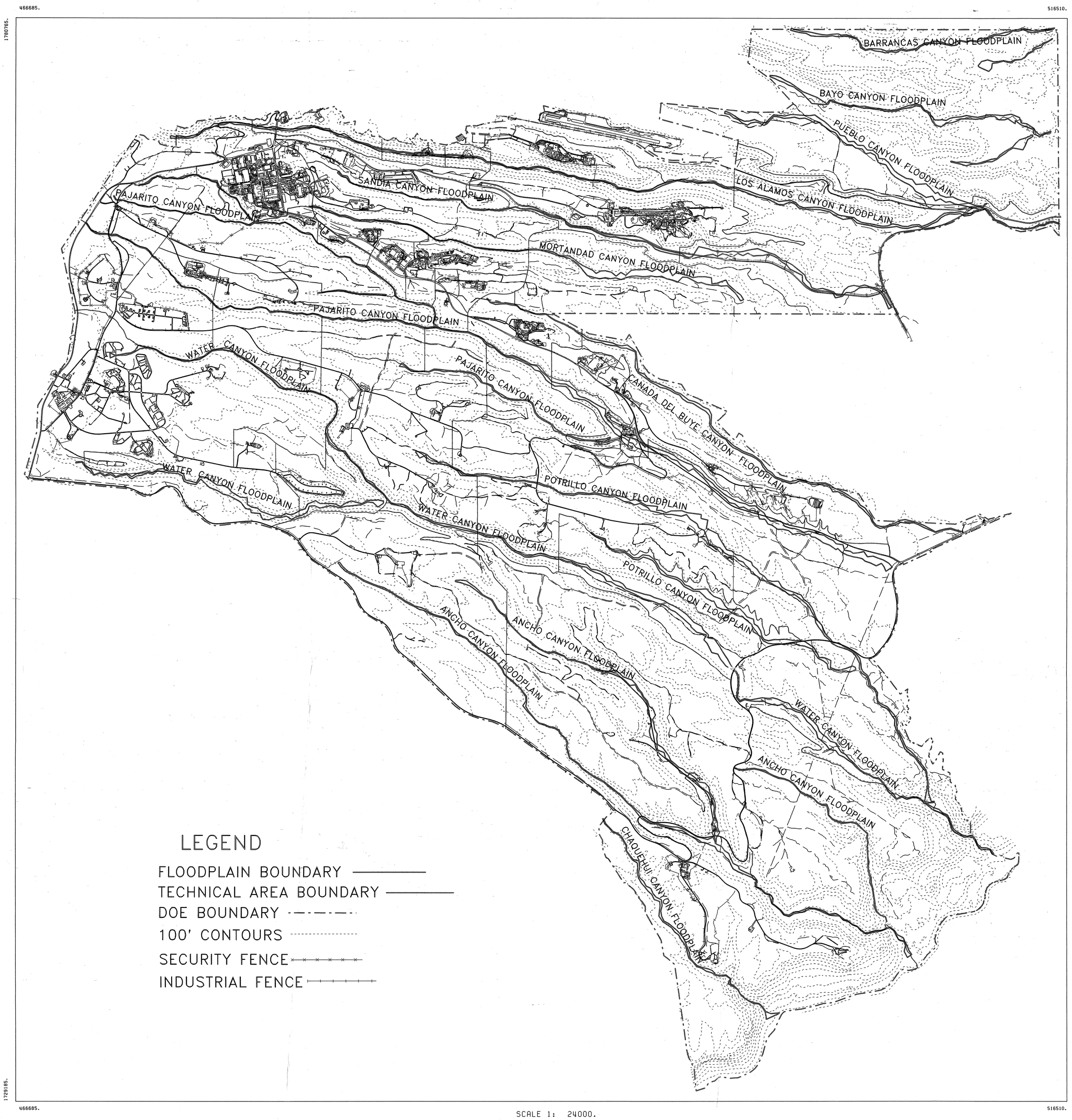
2.2.1 Seismic Standard

Consistent with the definitions presented in 40 CFR Part 270.2 and the criteria provided in Parts 270.14(b)(11)(i) and 264.18, the TA-53 surface impoundments are existing units and, thus, seismic design standards are not applicable.

2.2.2 Floodplain Standard

In accordance with 40 CFR 270.14(b)(11)(iii), it can be stated that the TA-53 surface impoundments are not located within the 100-year floodplain boundary. As required under the Hazardous and Solid Waste Amendments (HSWA) Module VIII of the HWF permit, LANL has mapped all 100-year floodplain boundaries within the LANL complex. The mapping procedure utilized techniques that comply with 40 CFR 270.14(b)(11)(iii).

LANL 100 YEAR FLOODPLAIN DATA



SCALE 1: 24000.

2000 0 2000 4000 FEET

N

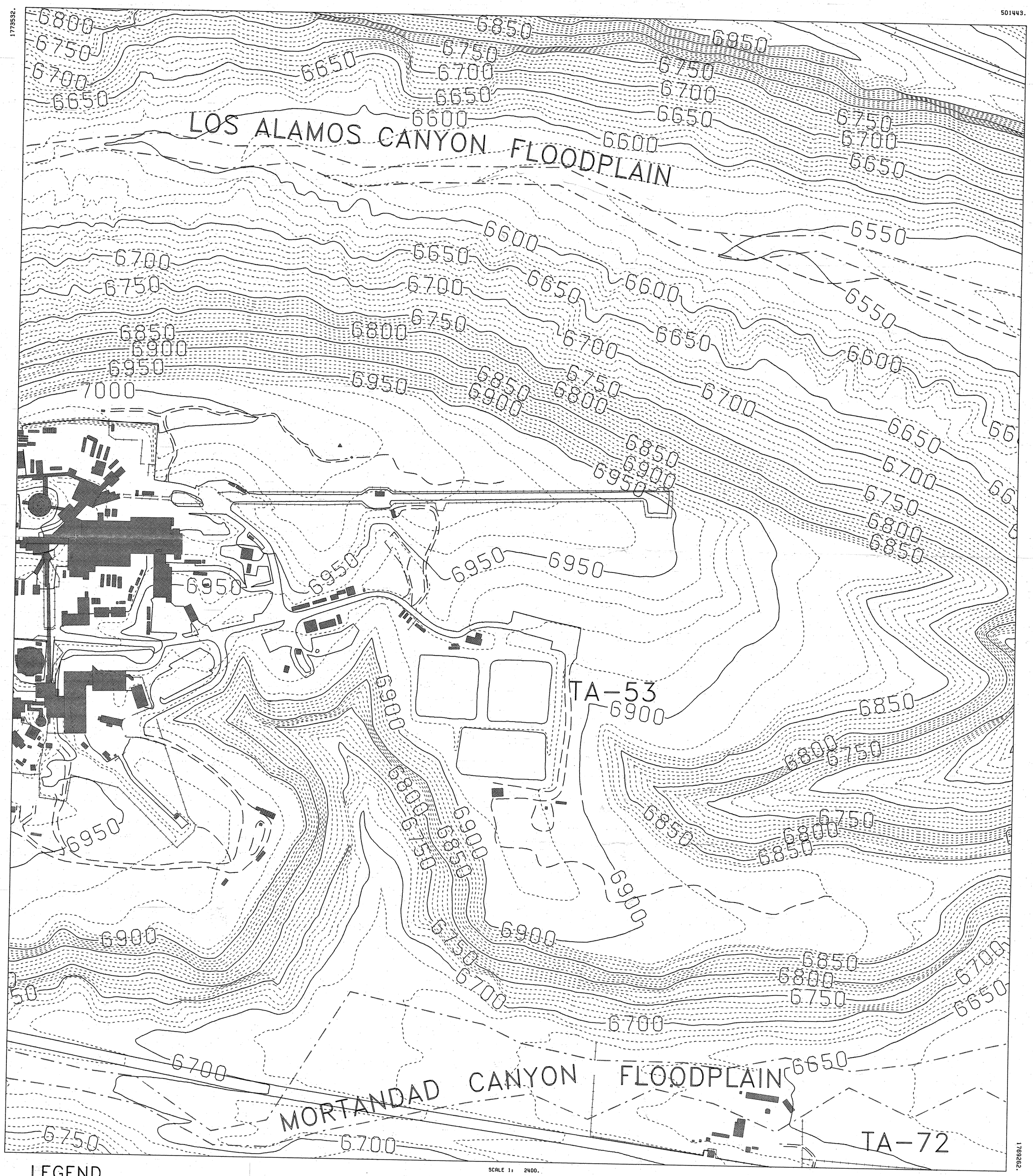
4276-A

AUTOGIS

5/18/92 11:49:20

Plotted on a CALCOMP 3655 Electrostatic Color System. Plot data from Embedded Controller with Mirror Image OFF, Negative Image OFF, Plot Expansion OFF, Conditioning Pass ON, Plot Speed at 100% of max., Condition Pass Speed at 100% of max.

TA-53 SURFACE IMPOUNDMENT AREA FLOODPLAIN MAP



LEGEND

FLOODPLAIN BOUNDARY

10' CONTOURS

INDUSTRIAL FENCE

4276-D

AUTOGIS

4/30/92 12: 1:36

A report documenting these floodplain mapping procedures has been published ~~is currently in press~~ (McLin, 1991). Actual floodplain boundary location maps are being finalized which will supplement the floodplain report. The floodplain boundary maps will reside on LANL's computer-based Autometric™ Geographic Information System — Mapping Overlay Statistical System (AUTOGIS-MOSS), a graphic information system database. Final floodplain maps were submitted to NMED in May 1992. ~~Final floodplain maps will be plotted at a 1:4,800 scale, and should be available and submitted to NMED in October 1991.~~

2.2.3 Soils

A comprehensive soil survey of Los Alamos County was prepared by Nyhan et al., 1978. This soil survey classifies the soils according to the soil series, soil type, and soil phase.

The principal parent materials of about 95 percent of the Los Alamos soils are Bandelier Tuff, volcanic rocks of the Tschicoma Formation, volcaniclastic sedimentary rocks of the Puye Formation, basaltic rocks of Chino Mesa, and remnants of the El Cajete pumice. The remaining five percent of the soils were formed from colluvium, alluvium, andesitic rocks of the Paliza Canyon Formation, Cerro Rubio Quartz Latites, and tuffs associated with sediments of Cerro Toledo Rhyolite. Textures of these soils range from very fine sandy loams and clay loams to gravelly, sandy loams and stony, silty clay loams.

The soils in TA-53 are classified as mesic rock outcrop. This land type is found on moderately sloping to steep mesa tops and edges and consists of about 65% tuff rock outcrop (Figure 2-8). Included in this unit are about five percent very shallow, undeveloped soils on tuff bedrock, five

percent Hackroy soils, and 25% narrow escarpments. Native vegetation is blue grama, piñon pine, and one-seed juniper (Nyhan et al., 1978).

The Bandelier Tuff is formed by a series of ash flows and ash falls which are described as nonwelded, moderately-welded, and welded tuff. The nonwelded, moderately-welded, and welded tuff grade vertically one into the other.

The soils are classified in the Unified Soil Classification System as SM, SM-SC, ML, and CL-ML. The Hackroy soils range from a sandy loam (SM) in the top eight centimeters of depth to a clay loam (CL) in depths of from eight to 30 centimeters. Permeability rates range from five to 15 centimeters per hour in the top layers down to 0.5-0.15 centimeters per hour or less in the lower layers. The shrink-swell potential is low. The available water holding capacity is 0.11 to 0.21 centimeters per centimeter and the soil pH is 6.6 to 7.8.

2.2.4 Geology

2.2.4.1 Regional Geology

LANL is located on the east-central edge of the Jemez Mountains. The Jemez Mountains are formed by a complex pile of volcanic rocks along the northwest margin of the Rio Grande rift in north-central New Mexico (Figure 2-9). The immense volume of Pliocene and Quaternary extrusive rocks that represents the Jemez volcanic field covers an area of over 30 miles east-to-west and 50 miles north-to-south and is over 4,000 feet in thickness near the center.

The Jemez volcanic field unconformably overlies the eastern part of the Nacimiento uplift and the southern Chama Basin. The Chama Basin, the San Juan Basin, and the Gallina-Archuleta arch

are part of the Colorado Plateau, whereas the Brazos and Nacimiento uplifts (Figure 2-9) are generally included with the southern Rocky Mountains (Woodward, 1974). These features attained their present structural outlines during the Laramide orogeny of Late Cretaceous and early Tertiary time. Superimposed on these Laramide structures is the Rio Grande rift that began to form during the Miocene. Volcanism in the Jemez area began in Pliocene time after initial development of the rift with extrusive rocks accumulating along the western margin of the rift contemporaneously with late stages of rifting (Woodward, 1974). Initial eruptions were dominantly mafic to intermediate flows, which probably formed low, coalescing shields. Eruptive activity culminated in the early Pleistocene with explosive, caldera-forming eruptions of ash-flow tuffs, which covered most of the shields and formed two calderas, the largest and youngest of which is the Valles caldera located seven to ten miles west of Los Alamos (Kudo, 1974). Extensive studies of the Jemez volcanism have been performed by Ross et al. (1961), Bailey et al. (1969), Smith and Bailey (1966, 1968), and Smith et al. (1970).

Major tectonic features here are dominated by vertical movements. Minor horizontal shift and compressional features, however, occur in parts of the Colorado Plateau and southern Rocky Mountain structures. The stratigraphy, structure, and tectonics of the Jemez Mountains and surrounding area have been the topics of a large number of reconnaissance and detailed studies (c.f., Dane, 1948; Kelley, 1954, 1955; Griggs, 1964; Woodward et al., 1972, 1973, 1974).

2.2.4.2 Site-Specific Geology

TA-53 is located on the western part of the Pajarito Plateau (Figure 2-10), which forms an apron of volcanic and sedimentary rocks around the eastern flanks of the Jemez Mountains. The plateau is aligned approximately north-south and is about 20 to 25 miles in length and five to ten

miles wide. It is bounded on the east by White Rock Canyon (which contains the Rio Grande), on the north and northeast by the Puye escarpment, and on the west by Sierra de los Valles. The Pajarito Plateau slopes gently eastward from an elevation of about 7,500 feet near the mountains toward the Rio Grande, where it terminates at an elevation of about 5,400 feet in steep slopes and cliffs formed by down-cutting of the river. The plateau has been dissected into a number of narrow mesas by southeastward-trending intermittent streams. The stratigraphy and structural features of the Pajarito Plateau are described in the following sections.

Stratigraphy

The Pajarito Plateau is underlain by a sequence of sedimentary and volcanic rocks and is typical of a terrain produced by concurrent sedimentation and volcanism (Figure 2-11). The oldest unit exposed around the margins of the Pajarito Plateau and penetrated by drill holes on the plateau is the Miocene Santa Fe Group. The Santa Fe in this area consists of friable to moderately-well cemented siltstone and sandstones that contains lenses of conglomerate and clay (Purtymun and Johansen, 1974). Some basalt flows are interbedded with the sediments in the unit. The lower part of the Santa Fe is comprised of fine arkosic sand and the upper part is composed of very coarse arkosic sand, latitic gravels, and volcanic detritus.

Overlying the Santa Fe Group are the volcanic rocks of the Tschicoma Formation, which consist of latite, quartz-latite flows, and pyroclastic rocks. The Tschicoma was extruded through the Santa Fe Group west of Los Alamos, forming the lower part of the Jemez volcanic pile. The thickness of the Tschicoma is unknown since the base of the unit is not exposed in the Pajarito Plateau area.

Interfingering with the Tschicoma and overlying the Santa Fe Group are the conglomerate and fanglomerate ~~fanglomeratic~~ rocks of the Puye Formation. The Puye contains a thin basal conglomerate composed of pebble through small boulder-size clasts of quartzite, quartz, granite, and volcanic debris in a matrix of coarse sand (Griggs, 1964). Overlying the conglomerate is a thicker fanglomerate comprised of debris that was washed eastward from the volcanic rocks of the Tschicoma Formation. The fanglomerate consists of a series of conglomerates and siltstones with up-to-boulder size clasts in a matrix of silt and sand. Beds of volcanic ash that were water-lain or possibly represent air fall materials are also present within the Puye Formation. The overall thickness of the Puye ranges from about 725 feet in the north-central part of the Pajarito Plateau to 220 to 270 feet along the east edge of the Puye escarpment to 60 to 80 feet at the north end of White Rock Canyon (Griggs, 1964).

Overlying and interfingering with the conglomerate of the Puye Formation are the basaltic rocks of Chino Mesa. The basalt, which is over 1,300 feet thick near the volcanic vents near Chino Mesa (Figure 2-11), thickens southward along the river and thins westward (Griggs, 1964).

The Pajarito Plateau is capped for the most part by the Bandelier Tuff, which ranges in thickness from about 1,050 feet along the western edge of the plateau to about 260 feet just west of White Rock. The Bandelier is composed of a basal unit of pebble-size pumice, overlain by a poorly sorted rhyolite tuff breccia and capped by a cliff-forming welded rhyolite tuff.

Structural Geology

The description of the geologic structure presented here was taken primarily from Griggs (1964). The geologic structure of surface rocks in the Los Alamos area is simple, although the structure

of underlying rocks may be complex. The regional dip of surface rocks of the Pajarito Plateau is one to two degrees east. Beds of the Santa Fe Group in the easternmost part of the area dip gently to the west.

The rocks of the Pajarito Plateau are broken by several northward-trending normal faults (Figure 2-12). The Pajarito fault zone lies near the western edge of the plateau in the southern part of the area. The Bandelier Tuff at the southern edge of the area and on the east side of the Pajarito fault is downthrown about 300 feet in relation to the tuff on the west side of the fault. The fault further north splits into two smaller subparallel faults, both downthrown to the east. Displacement decreases northward until both faults die out. The fault planes dip steeply to the east.

Two other normal faults, the Rendija Canyon and Guaje Mountain faults, are en echelon to the Pajarito fault zone and are located to the northeast. These faults are downthrown to the west and the fault planes dip to the west. The northernmost of the faults extends southward for a short distance subparallel to the northern extension of the Pajarito fault zone. The Bandelier Tuff is displaced about 50 feet across the en echelon faults. The older Tschicoma Formation, however, may be displaced as much as 500 feet along the easternmost fault. This difference in displacement tends to indicate recurring movement along a pre-Bandelier fault.

There are no faults or fault traces with Holocene displacements that have been located within 200 feet of the TA-53 surface impoundments. This information is provided to demonstrate compliance with 40 CFR 264.18(a).

2.2.5 Ground Water[1]

The only aquifer of the Pajarito Plateau capable of providing municipal and industrial water supply is in rocks of the Santa Fe Group and Puye Formation. The upper surface of this aquifer rises westward from the Rio Grande through the Santa Fe Group and into the lower part of the Puye Formation beneath the central and western parts of the plateau (Figure 2-11). The water in the aquifer moves from the major recharge area (probably the intermountain basins of the Valles Caldera, the apparent western boundary of the aquifer), eastward toward the Rio Grande where a part is discharged into the river through seeps and springs (Figure 2-13). The ground-water flow rate in the upper part of the aquifer is estimated to be about 100 feet per year. The intermountain basins are filled with deposits of clay, sand, and gravels which are underlain by volcanic debris resulting from the collapse of the caldera. The sediments and volcanics in the basins are highly permeable and saturated and recharge the main aquifer in the Santa Fe Group.

Minor amounts of recharge may occur in the deep canyons containing perennial streams on the flanks of the mountains. The intermittent streams in canyons which are cut into the plateau add little if any recharge to the main aquifer. Water balance calculations for the area of LANL indicate that the annual evapotranspiration rate exceeds the annual precipitation rate. Additionally, field investigations have shown that infiltration of precipitation into the Bandelier Tuff is essentially zero. At depths below ten feet, the volumetric moisture content of the tuff at LANL varies from about 4 to 6% on the mesas and from approximately 6% to saturation in the canyons with perched aquifers. In canyons where no perched aquifers are present, the volumetric moisture content of the tuff at depths below ten feet ranges from about 4 to 10%. If sufficient moisture is

[1]The discussion of ground water conditions in the Los Alamos area was extracted primarily from Purtymun and Johansen (1978) and Griggs (1964).

present to permit migration of moisture, unsaturated flow would be the predominant mechanism of movement in the Bandelier Tuff.

Figure 2-13 shows the locations of a number of wells completed in the Santa Fe Group and Puye Formation. Also shown are the contours drawn to depict the elevation of the top of the main aquifer and the depths at which water was encountered in the main aquifer at each well location. The gradient on the surface of the aquifer averages about 60 feet per mile beneath the plateau in the Puye Formation with the depth to water decreasing along with the gentle slope of the surface of the plateau from about 1,200 feet to the west to about 600 feet to the east. The depth to the water table under LANL ranges from about 900 to 1,200 feet except in the deeper canyons. The gradient of the aquifer steepens to about 100 feet per mile along the eastern edge of the plateau because of the lesser permeability of the Santa Fe Group sediments. The aquifer is under water table conditions in the western margin of the plateau and is artesian along the eastern edge and along the Rio Grande.

As expected, wells completed into the high permeability sediments and volcanics of the Santa Fe Group and Puye Formation are very productive. Wells located in the eastern well field, which penetrate about 1,600 feet of the fine-grained sediments of the Santa Fe Group, yield an average of 500 gallons per minute with a specific capacity of eight gallons per minute per foot of drawdown. Wells in the central part of the plateau, which are completed in the Puye Formation and coarser sediments of the Santa Fe Group, are higher yielding and average 1,000 gallons per minute with a specific capacity of about 35 gallons per minute per foot of drawdown.

The chemical quality of water varies among wells due to local conditions within the aquifer. In general, the quality of water is good; total dissolved solids (TDS) range from about 200 milligrams per liter to almost 500 milligrams per liter.

The Tschicoma Formation and the Bandelier Tuff, west of the Pajarito Plateau on the flank of the mountains, contain small localized bodies of perched water. The Bandelier Tuff contains no perched water beneath the Pajarito Plateau. Additional information on Los Alamos ground water and vadose zone characteristics is presented in Hydrogeologic Assessment of Technical Area 54, Areas G and L, Los Alamos National Laboratory (IT Corporation, 1987).

2.3 TRAFFIC PATTERNS

2.3.1 General

The rugged topography of alternating mesas and canyons present at LANL limits traffic circulation to only a few major arterial roads. The major roads are shown on Figure 2-1. ~~This road system is shown in Figure 2-2.~~ There are 19 miles of main highway, 22 miles of TA access roads, and 44 miles of roads in LANL's technical areas. A total of 85 miles of paved roads are present within LANL (Pan Am World Services Asphalt Road Maintenance Report, 1986).

The main access route to Los Alamos is State Road 502 (formerly State Road 4). The majority of traffic to Los Alamos approaches from the east on State Road 502. Alternate access routes are available on State Roads 4 and 501 from the southeast and southwest, respectively.

The pattern of east-west trending canyons at LANL prohibits north-south automobile travel in nearly all portions of the Laboratory with the exception of Diamond Drive. Los Alamos Canyon

is spanned at Diamond Drive by an 820-foot-long steel arch bridge which was completed in 1951 (Los Alamos National Laboratory, 1984). This bridge provides the main access between LANL facilities located on either side of Los Alamos Canyon.

Currently, over 9,000 people are employed at LANL (including LANL personnel and contractors). Roughly 3,500 people commute to the Laboratory daily from communities other than Los Alamos and White Rock (Los Alamos National Laboratory, 1982).

2.3.2 Waste Collection Areas

Sanitary sewage stored historically in the TA-53 surface impoundments was generated at many of the technical areas throughout LANL. This waste was ~~is~~ transported to TA-53 by truck on an as-needed basis. Transport of sanitary liquid waste occurred ~~occurs~~ on nearly all of the roads located within LANL. Sanitary liquid waste is no longer transported from other technical areas to the TA-53 surface impoundments. This practice was discontinued in early July 1991. Currently, only sanitary wastewater originating in TA-53 is transported via the sanitary sewer line to the TA-53 impoundments. Occasionally, equipment at one of the lift stations in the TA will malfunction, and the wet well must be pumped out by the septic tank pump truck while repairs are being made. Figure 2-14 identifies locations of lift stations and the route taken by the septic tank pump truck transporting sanitary wastewater to the impoundments. ~~Liquid waste generated on-site is transferred to the impoundments via sanitary and radioactive liquid waste sewer lines, shown in Figure 2-14.~~

Radioactive liquid waste is stored in 5 tanks (Tank MPF-1 in Building 1 and Tanks 68, 69, 144, and 145) within TA-53. When Tank MPF-1 nears capacity, its contents are analyzed for

radioactivity level and, if the levels are within acceptable limits, the liquids are pumped into a truck and transported to the south impoundment, where they are discharged. The liquids in the other four below-ground tanks are also analyzed for radioactivity level when each tank nears capacity. If the radioactivity levels are within acceptable limits, the liquids are pumped into the radioactive liquid waste line and transported via this line to the south impoundment.

There are no storm sewers in the vicinity of the impoundments.

2.3.3 Routes of Travel

Prior to July 1991, sanitary liquid waste was ~~will be~~ taken from the point of origin to the TA-53 surface impoundments. Traffic routes which were ~~may be~~ used to transport sanitary sewage include Pajarito Road, East Jemez Road, State Road 4, and West Jemez Road (State Road 501), all of which are shown on Figure 2-1. Transfer of sanitary liquid waste generated within TA-53 is accomplished via sanitary ~~and radioactive liquid waste~~ sewer lines and, therefore, does not require transport over road surfaces. Transfer of radioactive liquid waste generated within TA-53 is accomplished via the radioactive liquid waste line and, for tank MPF-1 in Building 1, by pumper truck. The route of travel for this truck is eastward along La Mesita Road from Building 1 to the south surface impoundment (see Figure 2-14).

2.3.4 Traffic Volumes

According to a report entitled "TA-3 Traffic Study", January 10, 1985, the peak traffic periods are between 7:15 and 8:15 in the morning and 4:15 and 5:30 in the afternoon. Although the report is limited to the TA-3 area, a few intersections outside the TA-3 area were examined. Approximately 5,100 people work in the TA-3 area. Consequently, the data presented in the

study should reflect the existing traffic conditions at LANL. However, the data for TA-3 will have higher vehicular volumes than the rest of LANL. Maps depicting vehicular traffic count movements at various intersections in the vicinity of TA-3 from the cited document are included in Appendix A.

Based on 1984 traffic counts, the Diamond Drive and Jemez Road intersection had a volume of 3,255 cars during the morning and 2,824 in the afternoon. At the intersection of Diamond Drive and Pajarito Road, the 1984 afternoon volume was 1,284 cars.

2.3.5 Traffic Control Signals

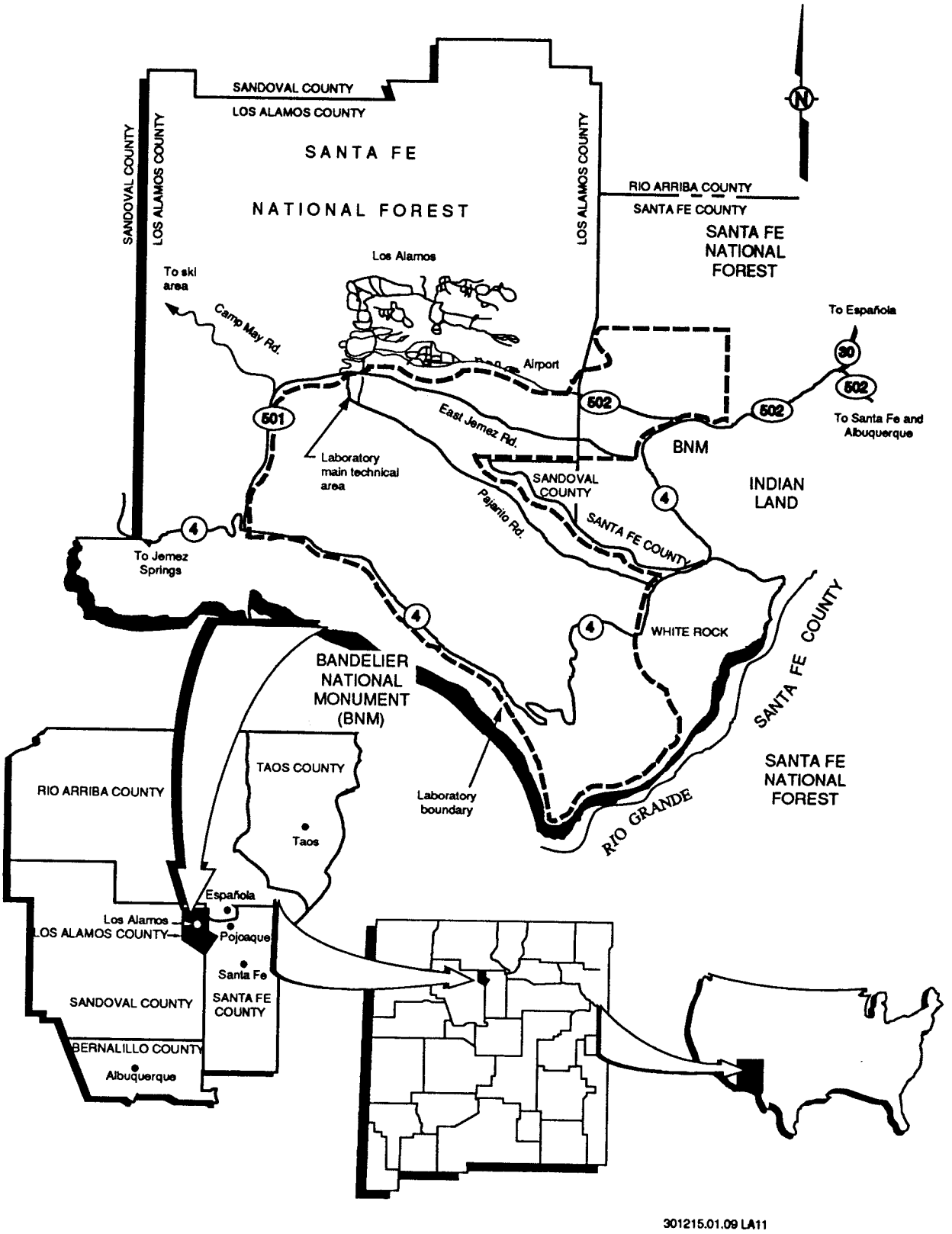
Site-wide traffic flow at LANL is controlled by traffic lights, stop signs, and yield signs. Traffic lights are in place at all major intersections. Traffic signs are used at "T"s throughout Los Alamos. Access to the high-security technical areas is controlled by security guards and is restricted to vehicles having specific identification. Only personnel having appropriate security clearance and identification or escorted visitors are allowed access to the secured technical areas. Vehicles and personnel entering these technical areas are subject to periodic search by security personnel. Traffic signals and signs are located in the vicinity of the hazardous waste management units.

Traffic control signals within TA-53 include stop signs, posted speed limits, and other traffic and pedestrian control signs. The locations of these signs along La Mesita Road, the main access road through TA-53, are shown on Figures 2-15 and 2-16.

~~Traffic lights are in place at all major intersections. Traffic signs are used at "T"s throughout Los Alamos.~~

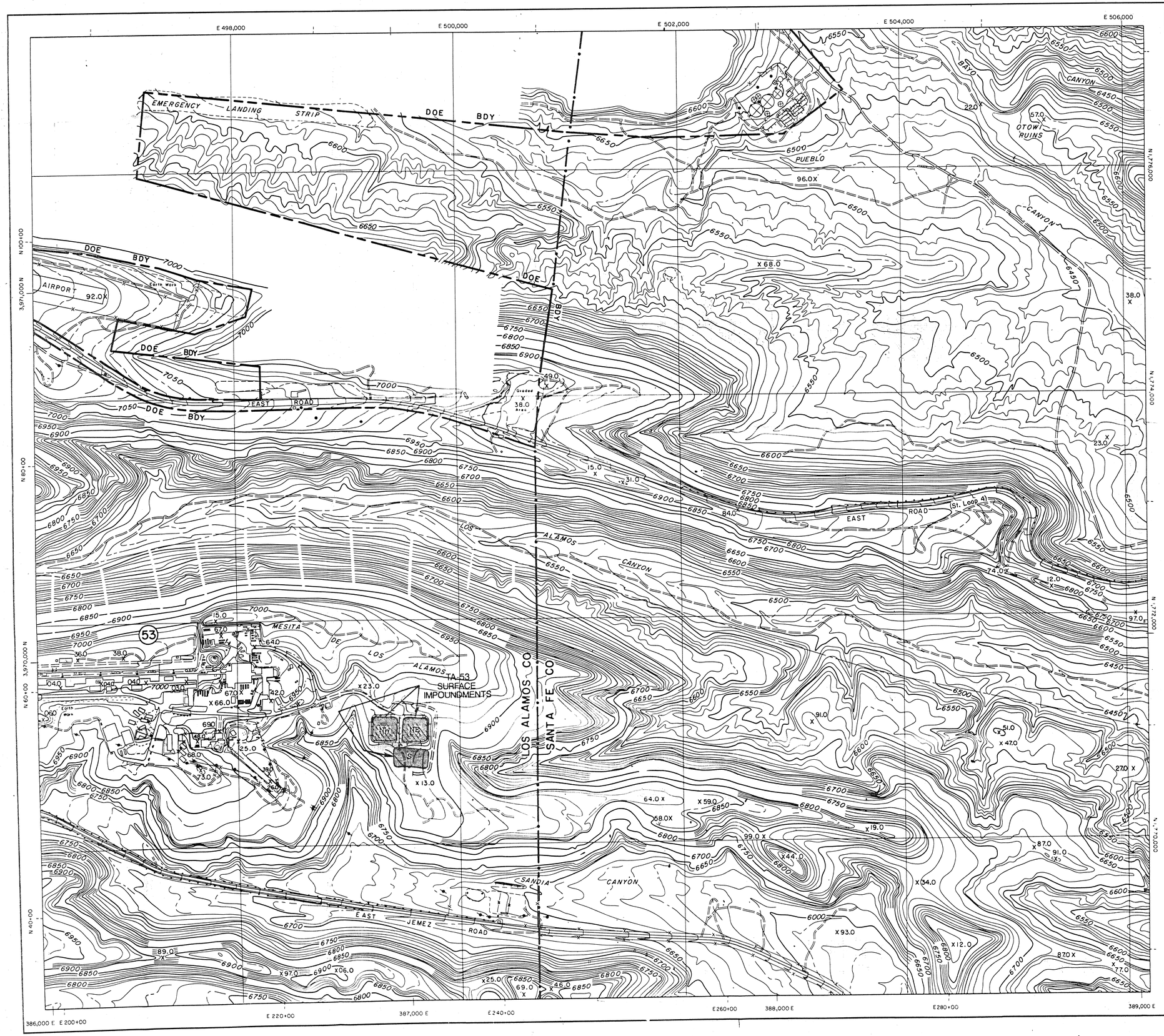
2.3.6 Road Load-Bearing Capacity

Roads at Los Alamos carrying the greatest traffic volumes include Diamond Drive, Pajarito Road, and East and West Jemez Drive. These roads were constructed with a ten-inch-thick base overlain with a five-inch-thick asphaltic concrete surface. These roads were designed and built in conformance with American Association of State Highway Transportation Officials (AASHTO) specification HS-20. This specification is intended to accommodate truck loading capacities of 32,000 pounds per axle. Roads within technical areas are two-lane roads with asphalt surfaces.



Reference: "Environmental Surveillance at Los Alamos During 1989", LANL, 1990.

Figure 2-1. Regional location map of Los Alamos National Laboratory and surrounding land use.

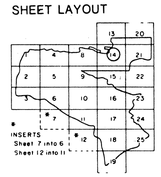


LEGEND

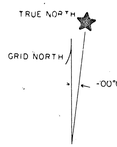
X 93.0	SPOT ELEVATION	N 1,768,000	NMSP GRID
6900	INDEX CONTOUR	3,989,000 N	UTM GRID
	INTERMEDIATE CONTOUR 10ft.	N 240+00	LASL GRID
	SUPPLEMENTARY CONTOUR 5ft.		
	CONTOURS THROUGH HEAVY VEGETATION		
	COUNTY LINES – TRANSFERRED FROM USGS 1:24,000 QUADRANGLES.		
	DOE BOUNDARY – X & Y COORDINATE DATA PROVIDED BY LASL.		
	DOE BOUNDARY – SURVEY DESCRIPTIONS OR RECORD PLATS PROVIDED BY LASL.		
	DOE BOUNDARY – TRANSFERRED FROM USGS 1:24,000 QUADRANGLES BASED ON PROJECTED COUNTY LINES.		

35	TECHNICAL AREA NO.		TOWER
	BUILDING		PIPE LINE
	FENCE		CUT LINE OR POWER LINE CLEARANCE SCAR
	PAVED ROAD		WATER TOWER
	DIRT ROAD	Tank	TANK
	JEEP TRAIL		POND
	CULVERT	RW	RETAINING WALL
	GUARD RAIL		EARTH DIKES OR BLASTING SHIELDS
	TUNNEL	Earth Work	EARTH WORK OR GRADED AREAS
	EARTHEN BUNKERS		GATE
	POWER POLE		

SHEET LAYOUT

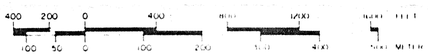


NORTH



GRID NMSP NORTH

MAPPING COMPLETED BY PHOTOGRAMMETRIC METHODS, UTILIZING 1:30,000, 1:12,000 & 1:13,200 PHOTOGRAPHY, OBTAINED IN NOV. 1976 & JUNE 1980 WITH ZEISS RMK A 15/23 CAMERAS OF 153.42 & 152.43mm C.F.L. RESPECTIVELY, MAPPING BASED ON CONTROL SURVEYS TIED TO THE NEW MEXICO STATE PLANE COORDINATE SYSTEM (CENTRAL ZONE). MAPPING COMPLETED IN ACCORDANCE WITH NATIONAL MAP ACCURACY SPECIFICATIONS.



GRAPHIC SCALE: 1 in.=400 ft. CONTOUR INTERVAL 10 ft

TECHNICAL AREAS

(53) MPF–SITE

4276-B

LOS ALAMOS SCIENTIFIC LABORATORY

FIGURE 2-3

CONTOUR MAP SHOWING THE LOCATIONS OF THE SURFACE IMPOUNDMENTS AT TA-53

LAB JOB NO. 5682

1" = 400' SCALE

PLAN / TOPO

SHEET 14 OF 25

LANL

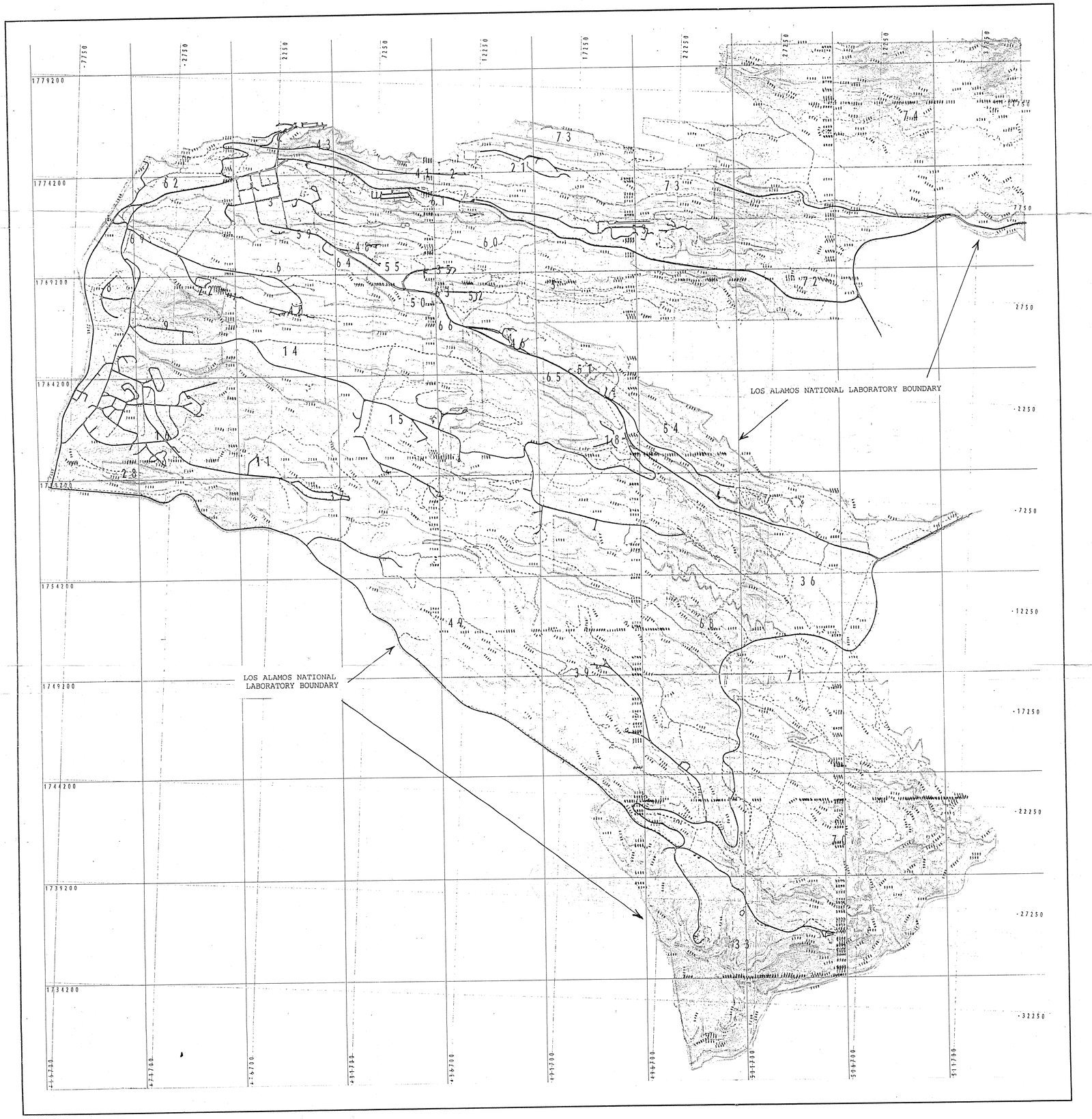


FIGURE 2-4

LOS ALAMOS NATIONAL LABORATORY BOUNDARY

SCALE

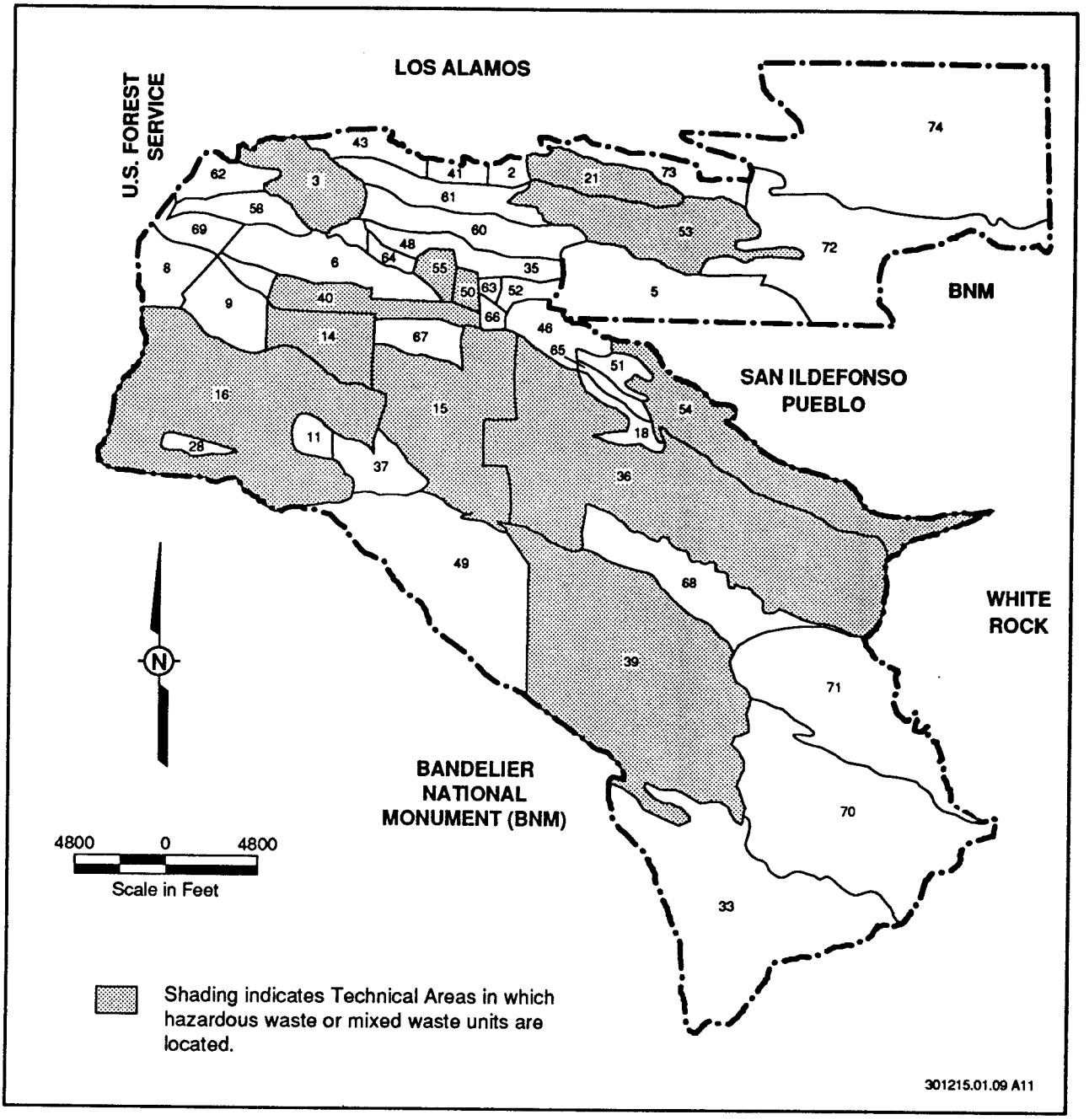
1" = 2500'

10-FOOT CONTOUR INTERVALS

4276-C

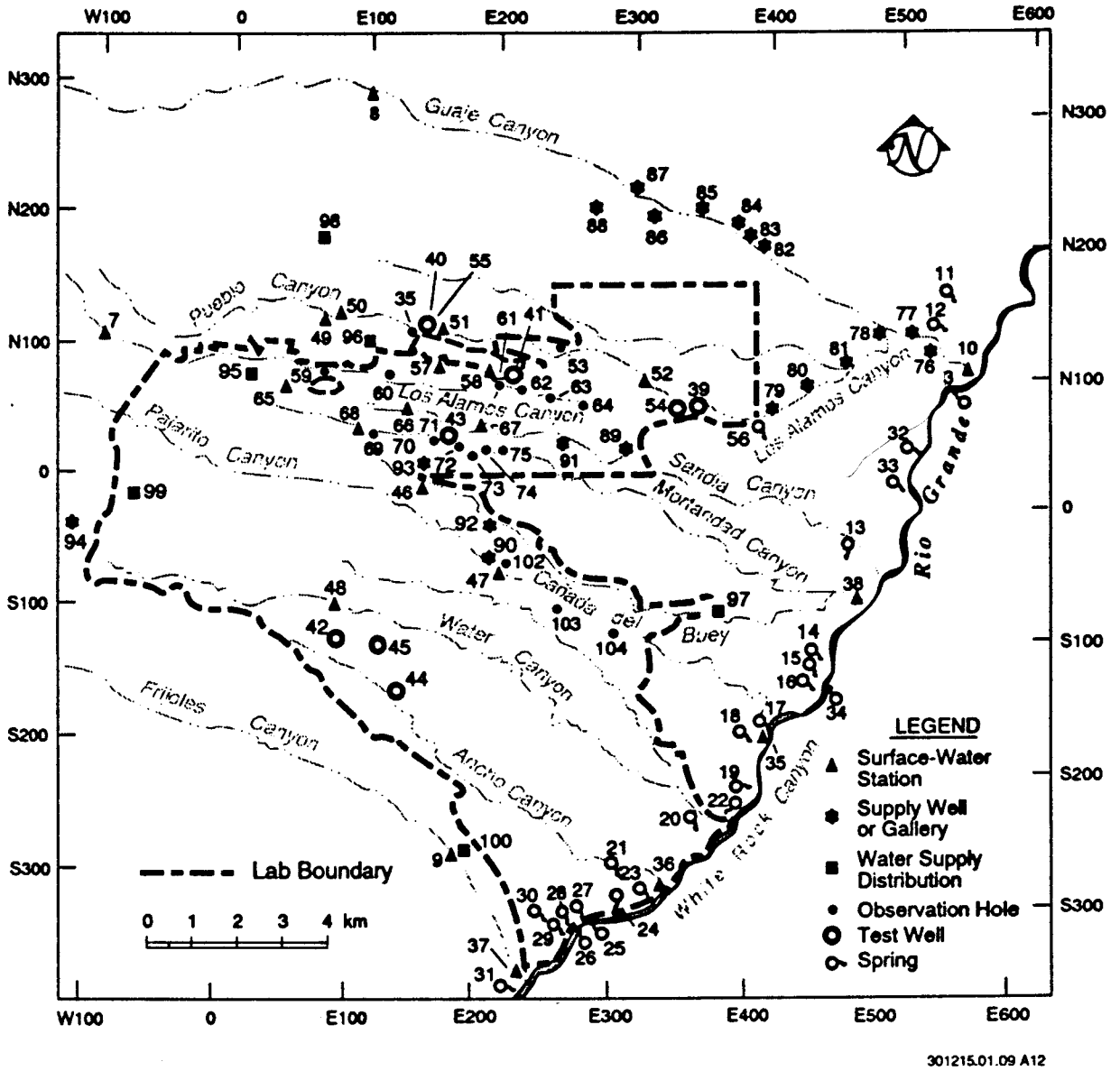
University of California
Los Alamos National Laboratory
Earth & Environmental Sciences Division
FIMAD Facility for Information Management, Analysis and Display
Produced by: Marcia Jones
Date: 91-02-19

Plotted on a CALCOMP 5825 Electrostatic Color System. Plot Data from Imbedded Controller with Mirror Image OFF, Negative Image OFF, Dot Expansion OFF, Conditioning Pass OFF. Plot Speed at 100% of max.



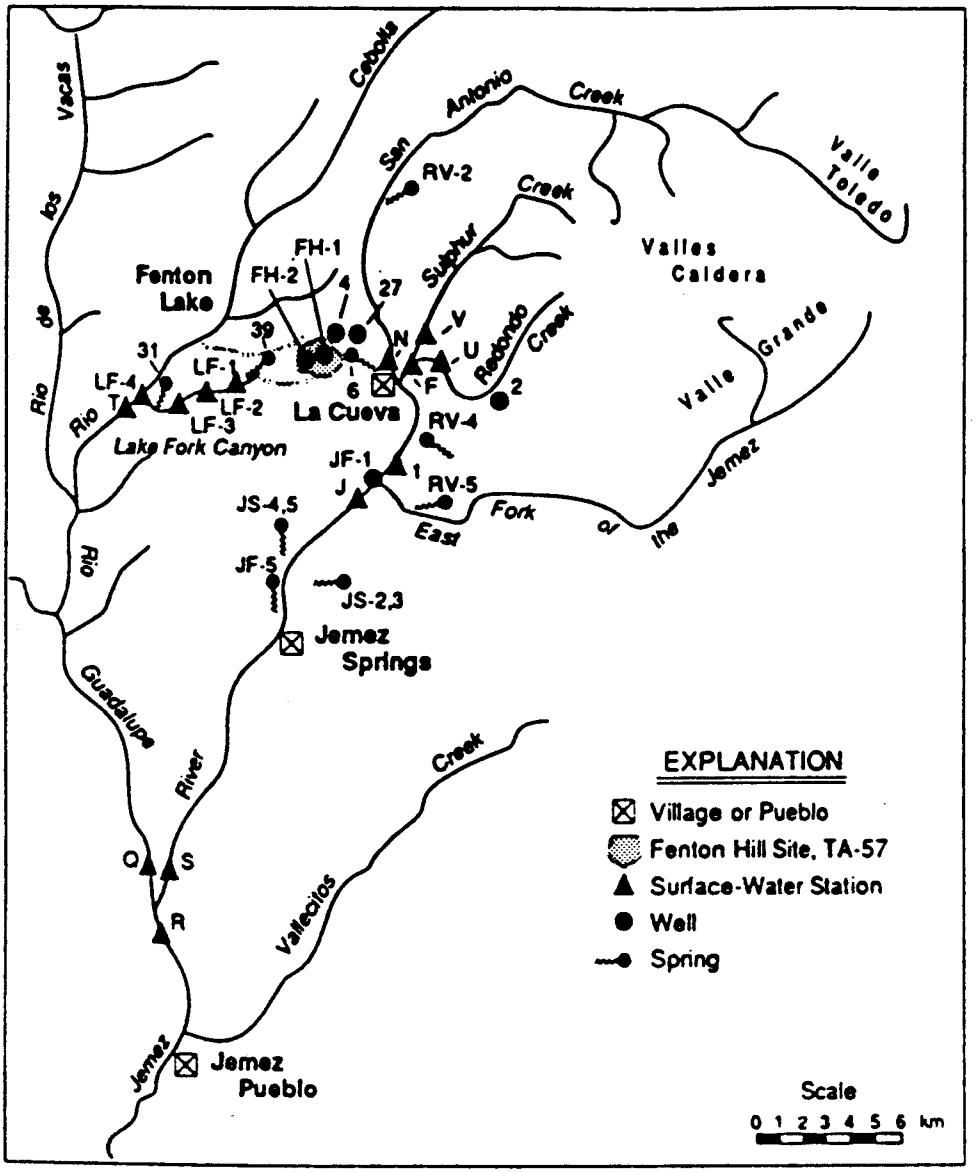
Modified from "Environmental Surveillance at Los Alamos During 1990", LANL, 1992.

Figure 2-2. Location map of Los Alamos National Laboratory Technical Areas.



Reference: "Environmental Surveillance at Los Alamos During 1990", LANL, 1992.

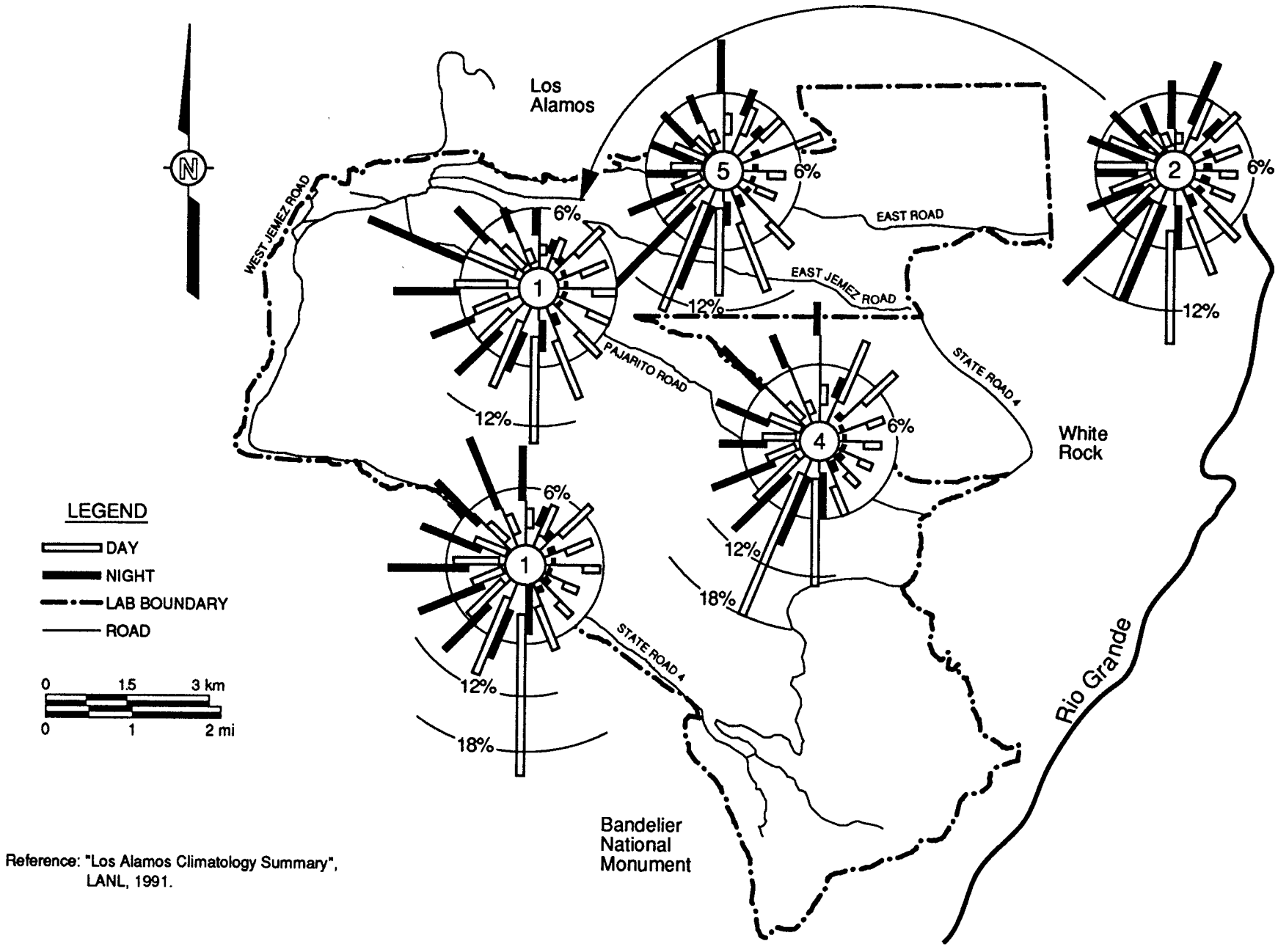
Figure 2-5. Location map of test wells, springs, observation holes, surface water sampling stations, and supply wells.



301215.01.09 A13

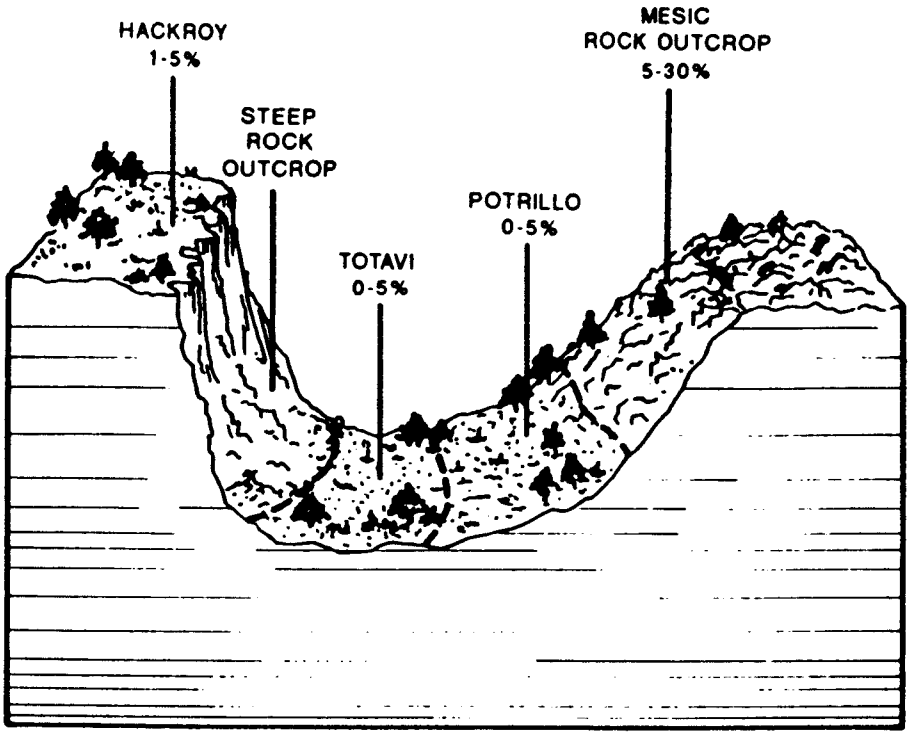
Reference: "Environmental Surveillance at Los Alamos During 1990", LANL, 1992.

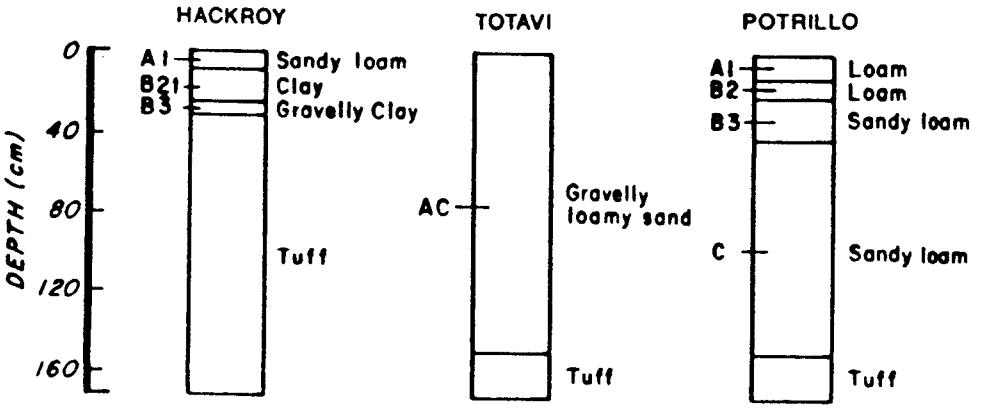
Figure 2-6. Location map of Technical Area 57, Fenton Hill Geothermal Site.



Reference: "Los Alamos Climatology Summary", LANL, 1991.

Figure 2-7. Annual wind roses for Los Alamos National Laboratory.





Reference: US DOE, 1978.

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Figure 2-8. Relationships of slope, vegetation, and parent material to Hackroy, Totavi, and Potrillo soils.

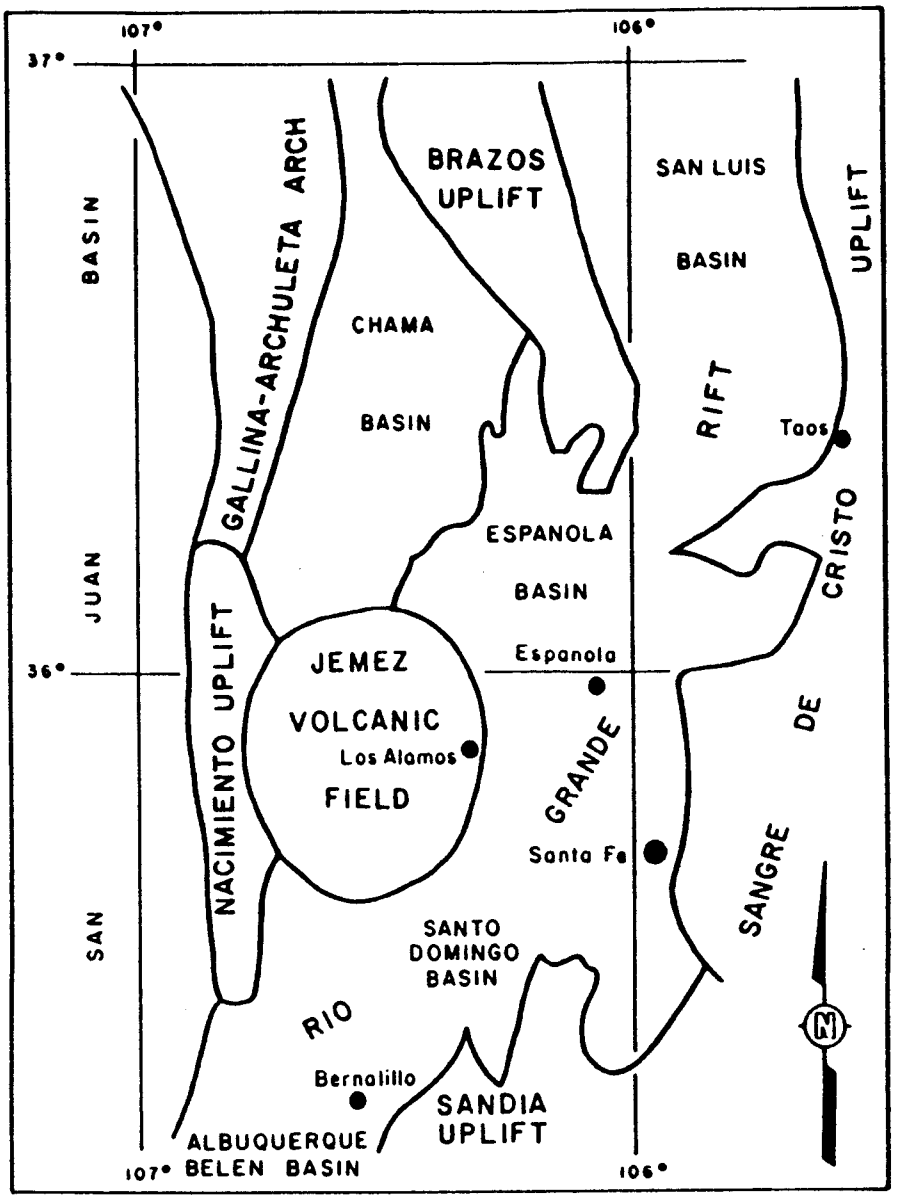
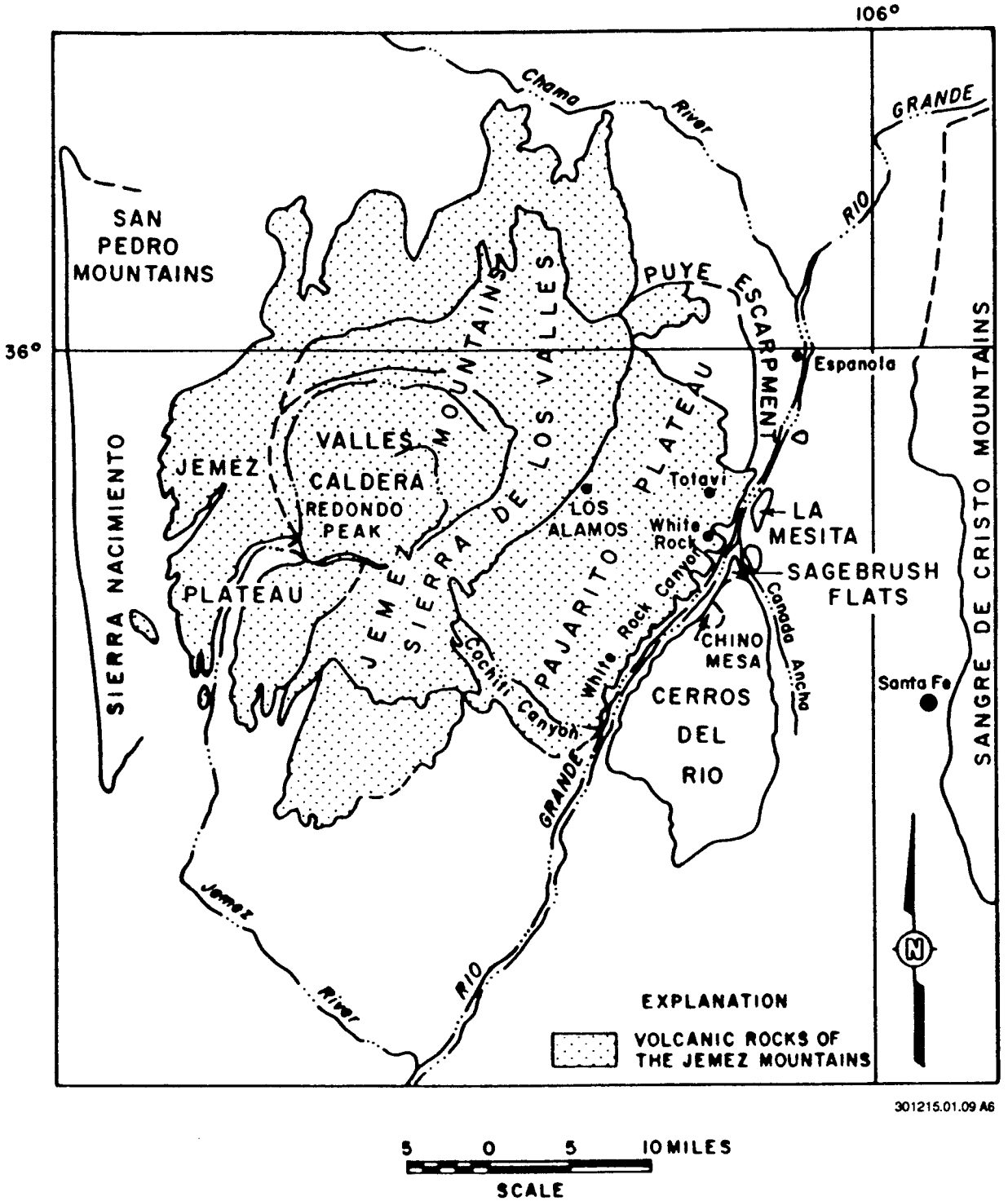
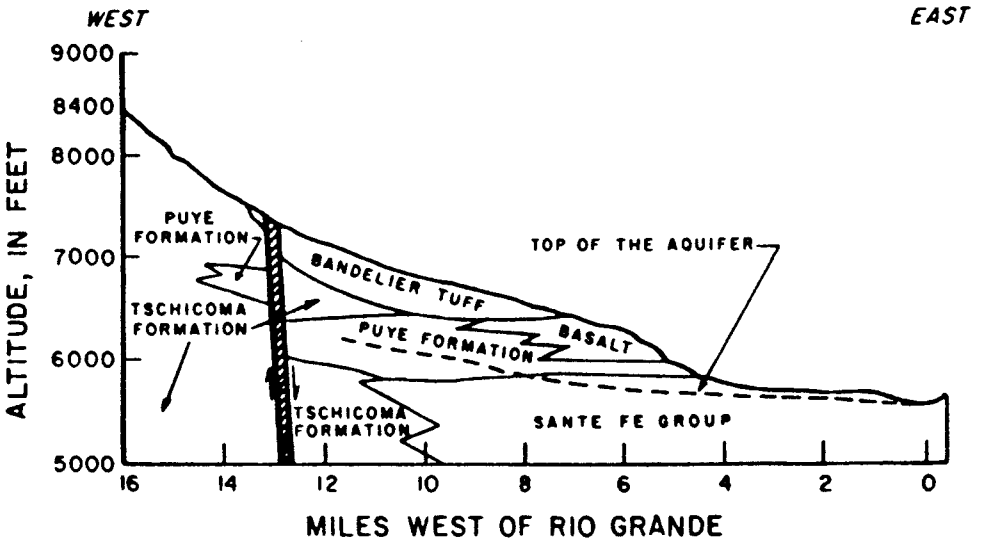


Figure 2-9. Index map showing major tectonic elements of north central New Mexico.



Reference: R.L. Griggs, 1954.

Figure 2-10. Physiographic features of the Jemez Mountains.



301215.01.09 A7

Figure 2-11. East-west geologic section through the Pajarito Plateau.

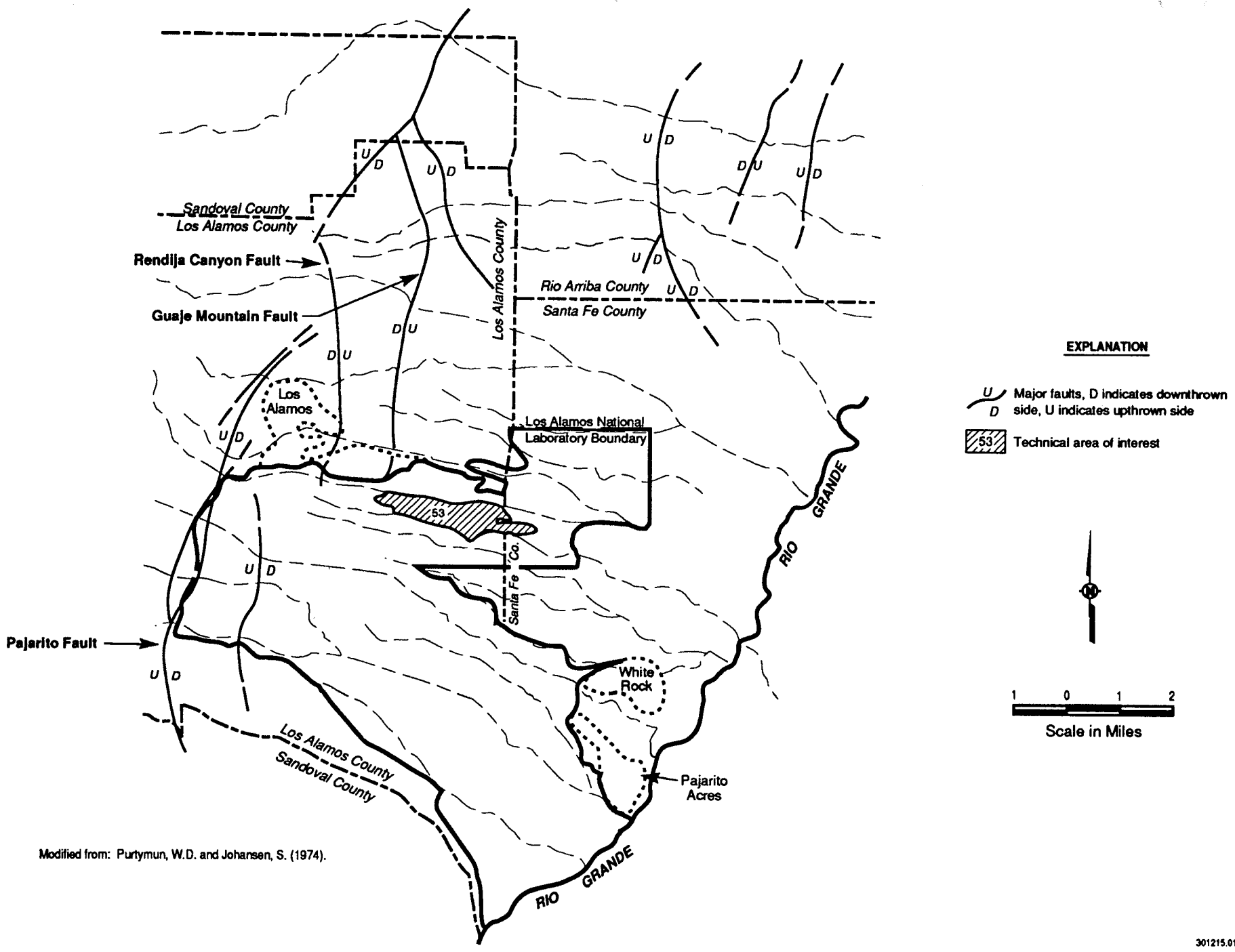
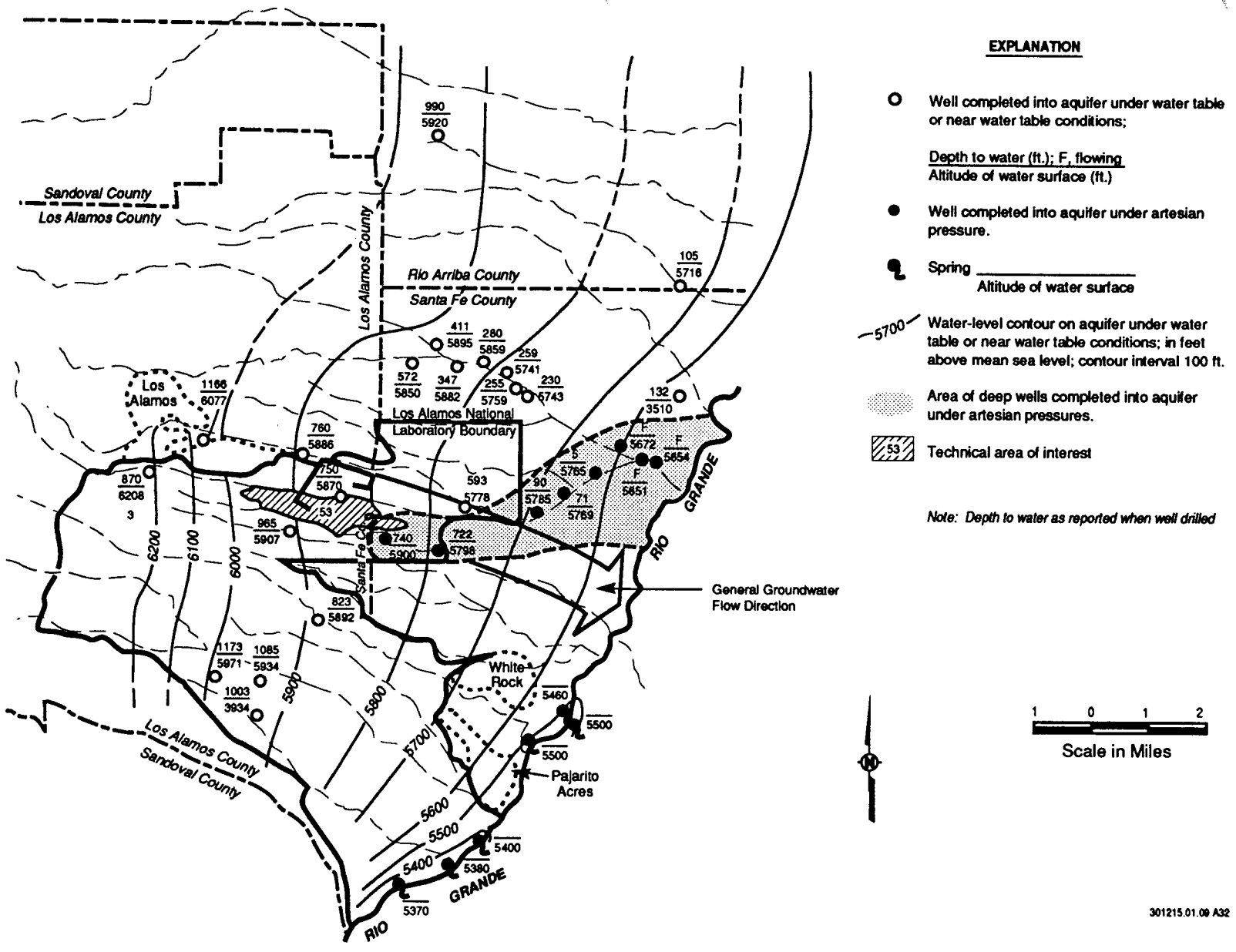


Figure 2-12. Location map of Los Alamos National Laboratory facilities relative to the nearby fault traces.



Modified from: Purtymun, W.D. and Johansen, S. (1974).

Figure 2-13. Generalized contours on top of main aquifer.

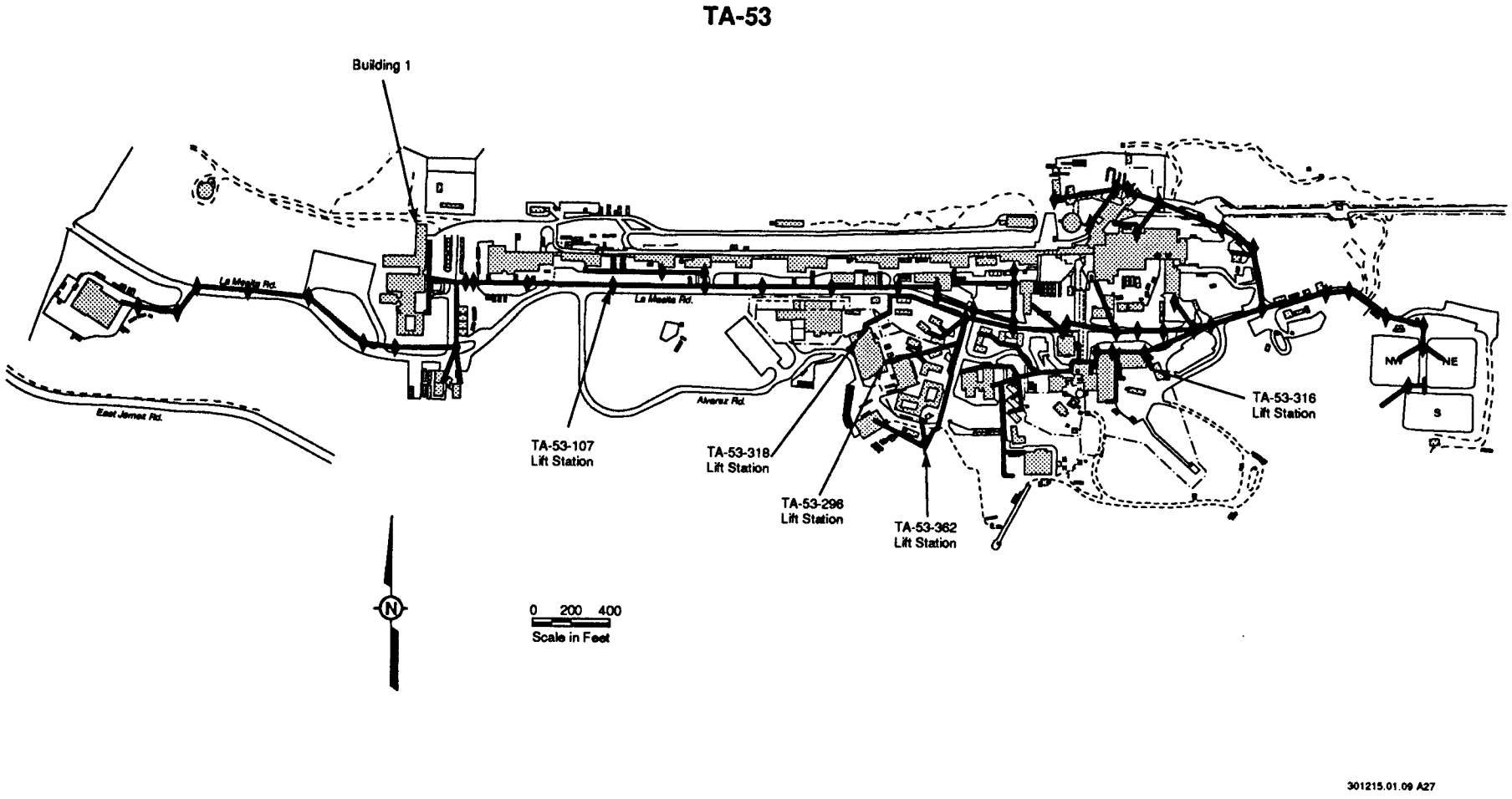


Figure 2-14. TA-53 wastewater collection system.

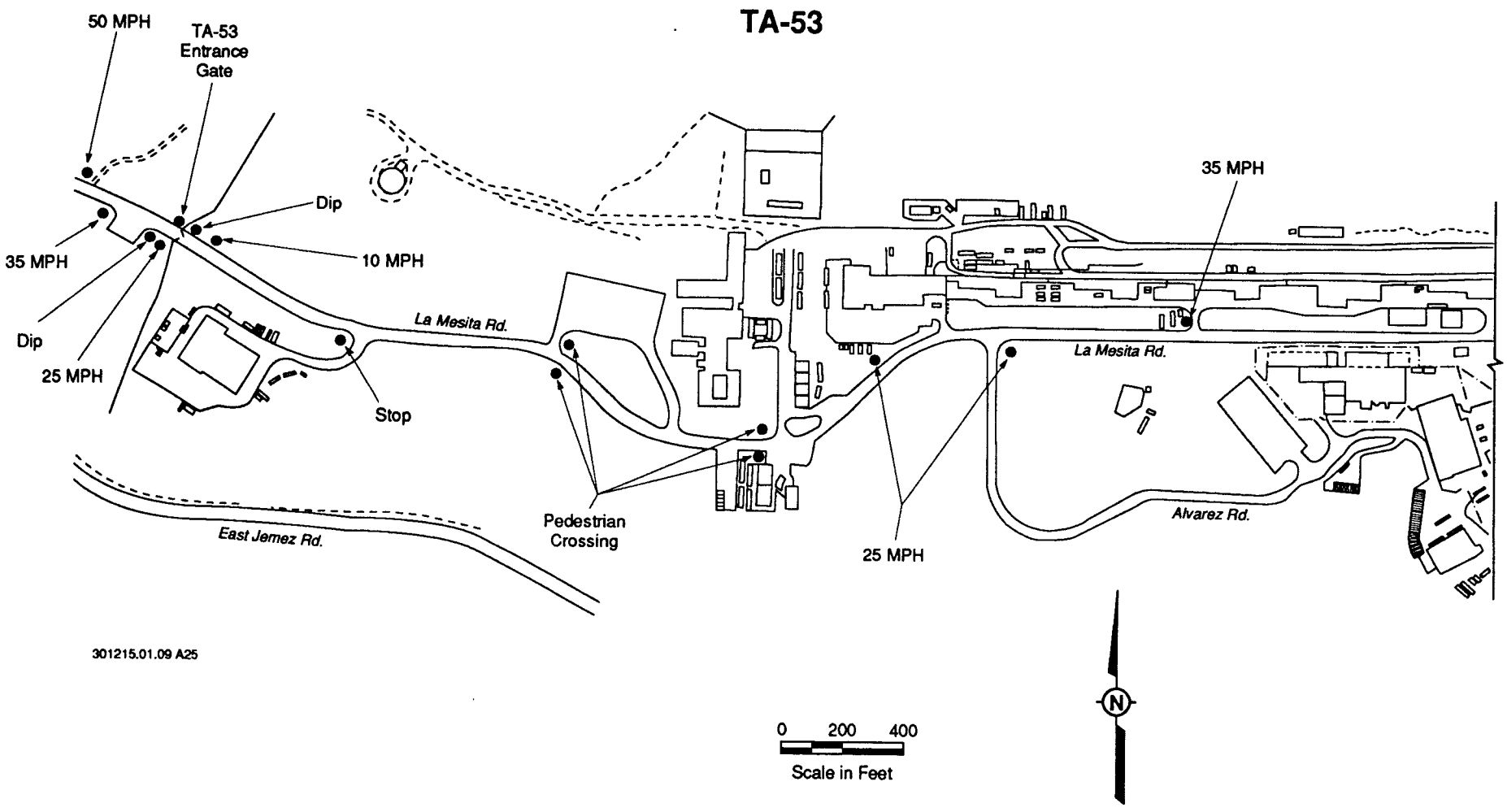


Figure 2-15. Location map of traffic control signs in the western portion of TA-53.

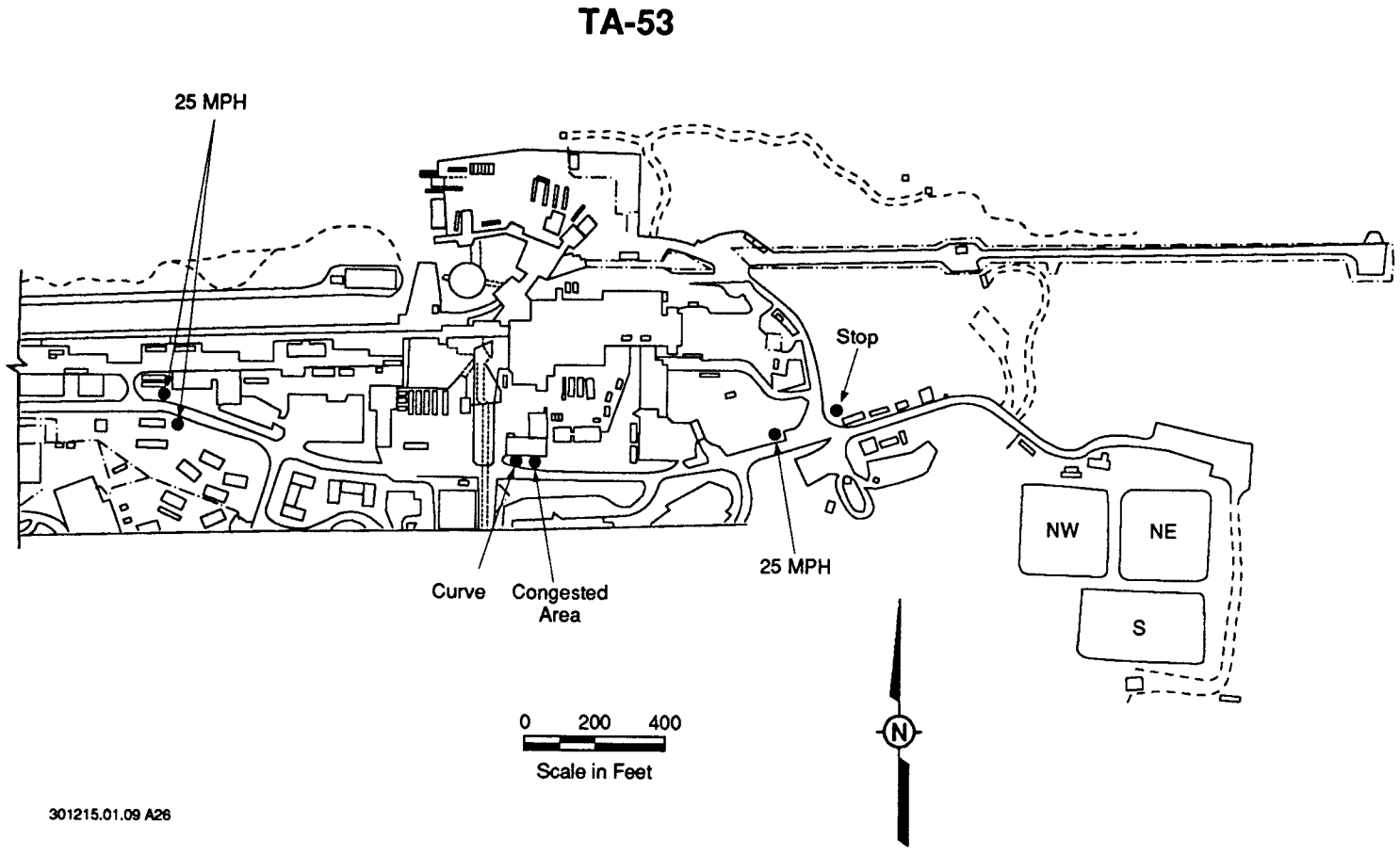


Figure 2-16. Location map of traffic control signs in the eastern portion of TA-53.

3.0 WASTE CHARACTERIZATION

Waste characterization requirements for the Part B permit application, specified in 40 CFR Part 270.14(b)(2) and (3), include chemical and physical analyses of the waste and a waste analysis plan. Waste characterization and waste analysis must fulfill the requirements of 40 CFR Part 264.13, which requires a detailed chemical and physical analyses of a representative sample of the waste.

The waste of concern in the impoundments is the sludge contained in the bottom of the impoundments. The TA-53-166 NE and NW impoundments have been receiving sanitary waste and small amounts of industrial waste since their construction in 1969; they also received radioactive waste until 1989. The TA-53-166 S impoundment received sanitary waste, small amounts of industrial waste, and radioactive waste from the time of its construction in 1985 until 1989, at which time the influent to the impoundment was modified so that it became the only impoundment to receive radioactive waste. It periodically may receive clean water and has previously received sanitary wastewater from the other impoundments to maintain appropriate liquid levels and weigh down the liner. As a result of past disposal practices, mixed waste may have been introduced into the impoundments. Based on results of past sampling activities, mixed waste in the sludge in the impoundments may include metals and organic compounds. Administrative controls have been implemented at TA-53 to prevent mixed waste from entering the influent to the impoundments.

The sampling and analysis plan ~~which will be conducted for the three surface impoundments is~~ included in this section was used, with the indicated modifications, during LANL's sampling effort at the impoundments in April 1992. Analytical results will be provided to NMED as they become

available. This ~~initial~~ sampling and analysis effort was ~~is~~ intended to fulfill the requirements for a detailed chemical and physical analysis of representative samples of the waste, as specified in 40 CFR 264.13(a)(1). The three surface impoundments are not intended to receive mixed waste; to ensure that mixed waste is not being introduced, the initial waste characterization will be verified annually through sampling and analysis of a representative sample of the influent to the NW surface impoundment. Because the influent to the NW surface impoundment is the only possible influent source of mixed waste, this sample will be sufficient to characterize each of the three impoundments. The annual sample will be a grab sample collected and analyzed for the same liquid sample parameters discussed in Section 3.1 to ensure that ~~the initial~~ characterization is accurate and up to date. The sample and sampling equipment will be handled in accordance with the applicable portions of Sections 3.2, 3.3 and 3.4. A grab sample is considered representative because of the administrative controls which have been implemented to prevent mixed waste from entering the influent.

3.1 SAMPLING AND ANALYSIS STRATEGY

Samples were ~~will be~~ collected using a systematic ~~simple random~~ sample strategy. Fifteen sample locations were established in each impoundment, each location equidistant from the impoundment walls and from each other. These blocks were sequentially assigned letter designations A through O. ~~The procedure for using this strategy is outlined in SW-846, Volume II, Part III. In accordance with this strategy, each surface impoundment will be subdivided into a grid of (approximately) 10 foot by 10 foot blocks. TA-53-166 NW and NE will contain 21 rows of 21 blocks, totalling 441 blocks. TA-53-166 S will contain 18 rows of 36 blocks, totalling 648 blocks. The blocks in each surface impoundment will be uniquely numbered and 15 blocks will be randomly selected from each surface impoundment using a random number table or pseudo-~~

~~random number generator. To maintain random ordering, these blocks will be sequentially assigned letter designations A through O as they are randomly selected; i.e., the first block selected is designated Block A, the second Block B, and so forth to Block O. Figures 3-1 and 3-2 are example schematics. These figures may be used to locate randomly selected sampling locations.~~

At the first ~~randomly~~ selected block (Block A) in each surface impoundment, one ~~a~~ liquid sample was ~~will be~~ collected at mid-depth of the water column prior to the collection of any sludge samples. These samples were ~~will be~~ taken in addition to the three liquid samples per impoundment collected and analyzed as part of an initial sampling effort in 1991. Analytical results for all samples will be reported upon completion of this sampling and analysis program. The water samples will be analyzed for target analyte list (TAL) metals, ~~and~~ total volatile organic (VOA) and base/neutral/acid (BNA) extractable compounds, polychlorinated biphenyls (PCBs), pesticides/herbicides, RCRA corrosivity, and tritium. The TAL metals include the RCRA Toxicity Characteristic Leaching Procedure (TCLP) metals, as well as other metals designated for analysis in the EPA's Contract Laboratory Program Statement of Work (TAL metals analysis constitutes total 40 CFR Part 264 Appendix IX metals analysis).

Sludge samples were ~~will be~~ collected within each of the selected blocks, as near to the center of the block as could ~~can~~ be achieved. ~~The depth of the water and approximate depth of the sludge will be recorded at each sampling location. If insufficient sludge is found at a selected block for the collection of an adequate sample volume, the absence of sufficient volume will be recorded in the Field Activity Daily Log (see Figure 3-4), and sampling will proceed to the next~~

~~location.~~ Sample collection procedures are described in Section 3.2. Sludge samples will be analyzed for TAL ~~TCLP~~ metals and total VOA and BNA extractable compounds.

At the NW and S ~~each of the three~~ surface impoundments, an additional confirmatory sludge sample was ~~will be~~ collected in each surface impoundment at field-designated locations nearest the surface impoundment influents or at areas where sludge deposition is thickest. These samples will be analyzed for TAL ~~TCLP~~ metals ~~and organics,~~ total VOA and BNA extractable compounds, ~~and~~ PCBs, pesticides/herbicides, and RCRA characteristics (e.g., ignitability, corrosivity, reactivity).

Field quality assurance samples were ~~will be~~ prepared in accordance with the following schedule: one trip blank accompanied ~~will accompany~~ each shipping cooler of water samples (containing VOA samples) to the analytical laboratory. One field blank sample from each surface impoundment was ~~will be~~ collected for TAL metals and total VOA and BNA extractable compounds analyses. ~~for the water analysis parameters.~~ Equipment rinsate blanks were collected each field day for TAL metals and total VOA and BNA extractable compounds analyses. There were a total of eight trip blanks, eight field blanks, and eight equipment rinsate blanks.

At one of the first five sludge sampling locations in each surface impoundment (Blocks A through E), ~~selected by random process prior to sampling,~~ a pair of field duplicate samples were ~~will be~~ collected in addition to the normal sample. This duplicate pair was ~~will be~~ designated for TAL ~~TCLP~~ and organic matrix spike/matrix spike duplicate analyses. ~~If insufficient volume is found at that location, the duplicate will be collected at the next location where sufficient sample material is found.~~ Field quality control samples are discussed in detail in Section 3.4.

3.2 SAMPLING PROCEDURES

3.2.1 Field Logistics

The sampling site will be examined prior to the start of field sampling to ensure that all required items are available. Coordination with the responsible group personnel at TA-53 for the use of storage and staging areas is required. Access is generally unimpeded to the site; however, access may be restricted to TA-53 at any time during the Meson Physics Facility operations. All personnel entering TA-53 must sign for a radiation monitoring film badge to be worn while within TA-53. Site workers must also have received all required radiation worker protection training as well as appropriate Occupational Safety and Health Administration (OSHA) and RCRA training.

Exact locations for electrical power, "clean zones," and drinking water must be identified prior to sampling. The waters of the surface impoundments are exclusion zones, and protective clothing must be worn if contact with surface impoundment waters or sludges is possible. Protective clothing requirements will be determined by the health and safety officer assigned to the project. Exclusion zones, access, staging, and decontamination areas will be designated adjacent to each surface impoundment. Protective clothing shall be donned by personnel within the exclusion zones. The areas will be selected for ease of ingress and egress to watercraft used for sampling, monitoring, water sample collection, and for initial sample processing.

A decontamination area will be designated for decontamination of tools, equipment, and personnel. (Decontamination procedures are discussed in detail in Section 3.2.8 of this plan.) All decontamination materials must be stored in drums with proper labels and identifying information. Efforts will be made to keep the volume of decontamination materials at a minimum. Persons involved in doing the actual decontamination will generally be dressed in protective

clothing one level below what the exclusion zone workers are required to wear. All personnel and equipment will be monitored for radioactive contamination prior to leaving an exclusion zone, central decontamination area, and the surface impoundment field site.

Field measurements for radioactivity and organic vapors shall be made and documented prior to, during, and after sampling activities at each surface impoundment each day that sampling is in progress. Qualified radiation protection and health and safety personnel (or designees) are responsible for this monitoring. Results of monitoring will be used to evaluate possible hazards existing at the site, evaluate current conditions, and specify personal protective equipment. All personnel will visually monitor for extreme weather conditions, lightning, or other physical or environmental hazards which may develop. Personnel will notify the project manager when unanticipated physical or environmental hazards develop.

3.2.2 Surface Impoundment Ingress/Egress

Ingress and egress to watercraft and the surface impoundments shall occur in exclusion zones established for that and supporting purposes. Ingress/egress via the slope of the surface impoundment dike will be aided by installation of a rope or chain and lumber-rung ladder constructed for that purpose. This ladder will be firmly anchored to the top of the dike surface by driving 18-inch steel stakes into the dike, one per ladder support. An equivalent device may be used for ingress/egress if it provides adequate footing and protection for personnel. Anchors and rigging shall be inspected prior to each descent or ascent of the ladder. Sampling personnel shall load equipment and supplies sufficient to collect samples from one designated location into the watercraft via the ingress/egress ladder within the exclusion zone.

3.2.3 Sampling Point Location

Two persons, in addition to two samplers in the watercraft, are required to assist with sample point location and provide support from the surface impoundment dike. Sample point locations ~~will be randomly~~ were systematically selected ~~on the imaginary grid of the surface impoundment~~ as described in Section 3.1. Personnel, one on each perpendicular leg of the surface impoundment dikes, shall assist the sample crew in maneuvering the boat to specified sample collection locations. Using a tape measure or calibrated pace, these sighting personnel will travel from a common corner of the surface impoundment (a point predetermined to be relative zero feet, northing, and zero feet, easting, for example) to the correct distance corresponding to the sample location in their direction. Using hand-held sighting compasses, the sighting personnel shall take a bearing along the dike-line just walked and then sight a line perpendicular to the dike-line. When the sampling crew is aligned with each sighting from the dike, the sighting personnel shall hand or verbally signal. When the sampling crew is within both sighting lines, they will be at the correct sampling location where they shall anchor and commence sampling. The type of anchoring device used must be such that it will not damage the impoundment liner.

3.2.4 Sludge Sampling Procedures

Surface impoundment sludge samples were ~~will be~~ collected at the ~~randomly~~ selected sampling locations. The samples were collected with a stainless steel beaker attached to a pole. ~~Sludge depth and consistency cannot be known in advance, because the sludge is underwater and not directly visible. Consequently, the exact method of sample collection cannot be specified in advance. Rather, the following alternative sampling methods are proposed which can be evaluated as site conditions allow. The project manager shall specify which sampling method to use.~~

~~At each sampling location, depth of water and approximate depth of sludge will be recorded prior to sludge sample collection. Every attempt shall be made to collect vertical sections of surface impoundment sludges for representative samples. Three methods are proposed for collection of sludge samples: the first is using a core tip sampler, the second is using a peristaltic pump, and the third is a grab sample method.~~

~~By the first method, samples may be collected using a stainless steel sludge sampler with core tip (requires hammer attachment) or auger tip (requires T handle) lowered to depth of threaded extensions. This sampler employs a butterfly valve to prevent sludge escape. The unit can be fitted with a stainless steel liner, to be capped with removable aluminum foil lined plastic caps, for collection of undisturbed core.~~

~~Procedure for sludge sample collection using the sludge sampler with core tip:~~

1. ~~Insert the stainless steel liner into the core barrel and assemble the sludge sampler with coring tip. Add appropriate length of extension handles and the hammer attachment.~~

2. ~~Lower the sludge sampler through the surface impoundment water and sludge to rest on the bentonite clay bottom. Using the hammer attachment, drive the coring approximately 1 inch into the bentonite clay bottom. (Do not drive the coring tip into the Hypalon liner of TA 53-166 S). Activate the butterfly valve to prevent sludge escape.~~

3. ~~Extract the sludge sampler and retrieve to the boat.~~

4. ~~Disassemble the core barrel and cap the stainless steel core liner.~~

5. ~~Extract the stainless steel core liner from the stainless steel core barrel. Measure and record length of the core.~~

6. ~~Remove the bentonite plug (optional) from the bottom of the core and transfer the entire contents, or split of the contents, to a wide mouth, 2 liter volume (minimum) amber glass sample jar. Samples will be split if requested by the NMED.~~

7. ~~Securely cap the container and carefully rinse with deionized water. Label the sample container, then place the container in a ziplock bag and custody tape the bag.~~

~~The second alternative method for collecting representative vertical sections of the surface impoundment sludges involves vacuuming the sludges from the bottom, and separating the liquids from solids at the surface. Materials required include a 4- or 6-inch diameter stainless steel pipe; 12 volt, direct current (DC) peristaltic (or vacuum) pump and tubing; 2 liter vacuum flask or bucket container; and small diameter (less that 3/4 inch, approximate) glass or stainless steel tubing (or flexible plastic tubing internally coated with Teflon™ affixed to a pipe or pole).~~

~~Procedure for sludge sample collection using a peristaltic pump:~~

1. ~~Lower the wide diameter stainless steel pipe through the surface impoundment water and sludge to rest on the bentonite bottom. One member of the sampling team shall hold the pipe in place.~~

2. ~~Assemble the peristaltic pump tubing, flask, and 12 volt power connections.~~

3. ~~Lower the rigid tubing (or flexible tubing attached to a pipe or pole) into the stainless steel pipe until the bottom is encountered.~~

4. ~~Turn on the peristaltic pump and vacuum sludge into a vacuum flask trap or directly into a bucket container. Continue vacuuming until sludge no longer remains in the stainless steel pipe.~~

5. ~~Allow sludge solids to settle and decant supernatant fluid off the sludge. For analysis other than volatile organic analysis, separate the liquid from sludge by gravity filtration through coarse filter paper.~~

6. ~~Transfer sludge to a 2 liter, wide mouth amber glass sample jar.~~

7. ~~Securely cap the container and carefully rinse with deionized water. Label the sample container, and place the container in a ziplock bag and custody tape the bag.~~

~~If sample team members are unable to collect vertical stratum samples of the sludge due to the consistency of the sludge or conditions at the site, a third method of sludge sample collection may be used. This a grab sample method using a Teflon™, glass, or stainless steel beaker attached~~

~~to a pole. This method ignores vertical representation of the sludge stratum and should only be used when the preferred methods fail.~~

~~Sample collection methods will be indicated on the Field Activity Daily Log forms (Figure 3-4) for every sample collected.~~

3.2.5 Water Sampling Procedure

Water samples were ~~will be~~ collected at mid-depth of the ~~randomly~~ selected sampling locations. Water samples were ~~may be~~ collected by using a ~~peristaltic pump and tubing (preferred), a discreet interval (zone) sampler, or~~ double check valve bailer. Samples were ~~should be~~ collected at the midpoint of the fluid column. ~~Samples~~ were ~~should be~~ placed directly in the appropriate containers and handled with procedures previously described for the sludges.

3.2.6 Sample Preservation and Handling

Samples will require cooling with ice or other chemical preservation at the time of collection or during laboratory preparation prior to analysis. All samples require field preservation as soon after collection as is practical. Sample containers which are prepared with appropriate preservative at the analytical laboratory may be used to simplify field preservation. Sample preservation will conform to requirements of SW-846, Volume II, Part III. Sample containers will be precleaned (typically by the original supplier) using EPA quality assurance protocols appropriate for the intended use of the sample container. Sample container requirements, preservation, and holding times are listed in Table 3-1.

Following sample collection, sample container lids shall be fixed tightly to the containers and the outside of the container carefully rinsed with deionized water. The purpose of the rinse is to minimize the spreading of radioactive materials via the sample container surfaces. Sealed and labeled sample containers will be placed in polyethylene Ziploc® ~~Ziplock~~ bags as secondary confinement in the event of leakage or breakage. The secondary sample containers (Ziploc® ~~Ziplock~~ bags) will be sealed with custody tape so that evidence of opening is immediately obvious. Custody tape will be initialed and dated by a member of the field team. The outside surfaces of the secondary sample containers will be monitored for radioactivity prior to packaging for transportation to the analytical laboratory.

Samples will be packaged in shipping coolers, cooled to approximately 4 degrees Celsius (4°C), with adequate cushioning and absorbent materials to reduce the likelihood of breakage and to contain fluids should breakage occur. Sample custody, analytical request documentation, and any additional laboratory-required documentation will be placed in Ziploc® ~~Ziplock~~ bags and taped inside the cooler lid. Any sample with suspect hazardous constituents or with radioactive contamination greater than or equal to 2 nanocuries per gram must be accompanied by a completed Hazardous Materials Transfer Form (Figure 3-1 ~~3-3a~~). If analyzed off site, placards bearing the word "RADIOACTIVE" shall be placed inside the cooler, on top of the packing materials, so as to be obvious when opening the cooler. All coolers not shipped off site will have placards on the outside of the coolers. Sample coolers will be sealed with packing tape and radioactivity measurements will be taken at the cooler. Results of this radiation screening will be clearly indicated on the outside of the cooler. The project manager is responsible for packaging and placarding in accordance with Department of Transportation (DOT) regulations (when samples are transported via ground transportation) or International Air Transport Association

(IATA) regulations (when transported by commercial cargo aircraft). Appropriate waybills will be affixed to the shipping coolers for off-site shipment and the samples will be transported to the analytical laboratory as quickly as is practical.

3.2.7 Field Sample Documentation

Figures 3-2 ~~3-3b~~ through 3-5 ~~3-8~~ are examples of the types of documentation which were used for sample documentation and tracking. ~~appropriate for field sampling activities.~~ Preprinted forms which prompt the user for specific information may be used (forms equivalent to those shown in the figures) and the project manager will keep a field file box for retaining pertinent information. The purpose of each field document is described below.

~~Tailgate Safety Meeting Documentation Form (Figure 3-3b). A Tailgate Safety Meeting will be conducted and documented on the form each morning prior to the start of field activities and any time changes in site conditions, work scope, or site hazards warrant. The form details location of the work site, work site hazards, personal protective clothing to be used, location of emergency medical facilities, and special equipment or procedures to be used. Each member of the field team and all personnel on site must sign the form, as well as the person conducting the meeting. The Tailgate Safety Meeting form is signed by the field supervisor and that supervisor's manager.~~

~~Field Activity Daily Log (Figure 3-4). The Field Activity Daily Log is used to record any pertinent information concerning activities at the site. User of the form is prompted to identify the project and activity, describe the field activities, note visitors on the site, weather conditions, changes to plans or specifications, telephone calls, etc. The Field Activity Daily Log is signed and dated by~~

~~the person making the entries. More than one field team member may keep Field Activity Daily Log records.~~

As an alternative to Tailgate Safety Meeting Documentation Forms, a Site Health and Safety Plan was used for health and safety instruction in the field. Instead of Field Activity Daily Log Sheets, sampling activities were recorded in field notebooks.

Sample Label (Figure 3-2 ~~5~~). Each sample collected shall have a unique sample identification number assigned and recorded on an attached sample label. The sampling number scheme will be determined prior to start of field work. Sample numbers will contain unique identifiers of sample location, date, etc. Sample numbers will be recorded on the sample labels with waterproof, indelible ink (except for VOA samples, which will be labelled using ball point or other nonsolvent-containing ink). Labels will be of a waterproof material, not plain paper. The sample label must be completed to include the project name, sample number, collection date/time, collector's name, sample location, sample media description, preservative, and analysis requested. For samples analyzed on site, preprinted sample labels containing only the sample numbers and initials of sample collector may be used.

Sample Collection Log (Figure 3-3 ~~6~~). The sample collection log documents sample number, type, location, and other general descriptive information about each sample taken.

Chain-of-Custody Record (Figure 3-4 ~~7~~). The Chain-of-Custody Record documents a sample's history from collection through analysis and disposal. Upon collection in the field, every sample shall be recorded on a Chain-of-Custody Record using the unique sample identification number.

The person(s) collecting the sample must be identified on the form. A sample is considered to be in a person's custody when it is in his actual possession, in view after being in his physical possession, locked so that no one can tamper with it after being in his physical possession, or in a secured area restricted to authorized personnel. When custody of the sample(s) is passed from the sample collector to other personnel, the person relinquishing and receiving custody must sign, date and time-stamp the form so that the custody record remains unbroken. When samples are consigned to a commercial shipper, the person having custody at that time signs as relinquisher; the shipper's waybill then becomes part of the custody record, and the receiving laboratory signs for receipt upon opening the sample cooler. Chain-of-Custody Records must remain part of the permanent documentation for field sampling activities.

Request for Analysis Form (Figure 3-5 ~~8~~). The Request for Analysis form corresponds to the Chain-of-Custody Record in that both record information concerning the same group of samples. The Request for Analysis form provides information for the analytical laboratory on sample size, type, volume, and preservative; project identification and contact information; analytical tests to perform; project-specific quality control required; possible sample hazards, if known; and the requested disposition of the sample following analysis. The Request for Analysis form becomes part of the permanent project documentation.

3.2.8 Decontamination

Sampling equipment was ~~will be~~ cleaned with a nonphosphate detergent before use for each sample and at the end of sampling. All decontamination procedures took ~~shall take~~ place within an exclusion zone or centralized decontamination area designated for that purpose. Methanol or acetone rinses were ~~will~~ not ~~be~~ used in order to not compromise samples taken for volatile

organic analyses. Following wash with detergent, sampling equipment was ~~will be~~ rinsed three times with deionized water. The final deionized water rinse was ~~will be~~ collected in a separate container and sampled as a rinsate blank for the surface impoundment water sample parameters. Following decontamination, sampling equipment was ~~will be~~ monitored for radioactivity. ~~Additional decontamination procedures to prevent the spread of radioactive contamination may be mandated by the project manager.~~ Sampling equipment was ~~will be~~ decontaminated prior to collecting every sample.

3.2.9 Waste Disposal

Waste generated during field sampling activities ~~is expected to~~ consisted of used personal protective equipment (gloves, booties, clothing, etc.), paper and packaging type waste, excess sample fluids and materials, and decontamination solutions. Excess sample fluids and materials and decontamination solutions was ~~may be~~ returned to the surface impoundments. Other waste was ~~must be~~ bagged in polyethylene lined drums and contained on site. All waste generated within an exclusion zone or designated decontamination area must remain segregated from other wastes and the contents marked on the outside of the container. All waste will be screened for radioactivity prior to leaving the sampling site for storage or disposal.

3.3 ANALYTICAL REQUIREMENTS

Test methods for chemical analysis will be performed according to procedures documented in SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, U.S. EPA, Office of Solid Waste and Emergency Response, Third Edition, November 1986.

Minimum calibration, operation, and quality control (bias, precision, blank, and matrix effects) requirements for laboratory analyses shall be performed as listed in the individual analytical methods of SW-846.

Mass spectra library searches for Tentatively Identified Compounds (TICs) will be performed. Analytical methods to be used in the analysis of sludge and water samples and target detection limits are listed in Table 3-2 ~~(TCLP and~~ (total metals) and Table 3-3 (organics). Detection limits are laboratory-determined based upon instrumentation and sample matrix. Sample detection limits may be greater than the target values indicated in the tables; however, all detection limits must be below any corresponding regulatory compliance limit.

3.3.1 Analytical Methods

Summary descriptions of the analytical methods required for this sampling and analysis plan are provided below:

~~Toxicity Characteristic Leaching Procedure (TCLP) - Method 1311 (40 CFR Part 261, Appendix II) determines the mobility of organic and inorganic analytes present in liquid, solid, or multiphasic wastes. The procedure is a preparatory to chemical analysis by a variety of conventional techniques, which then determines analyte concentrations in the TCLP leachate. Analyte concentrations in TCLP leachate determine if wastes exhibit the toxicity characteristic. One hundred gram minimum solid samples are recommended for the analysis; if a smaller sample is used, the proper ratio of extraction liquid volume to sample weight must be maintained. Liquid or sludge type samples are collected in a 2 liter (approximate) amber glass, wide mouth jar. Separate leaching procedures are required for volatiles than for extractable organics and metals.~~

Inductively Coupled Plasma Emission Spectroscopy (ICP/ES) - Method 6010 and EPA CLP Inorganic Statement of Work describes the simultaneous or sequential determination of elements in solution using this instrumentation. Most metallic analytes can be determined using this method; however, detection limits vary between elements due to their emission characteristics.

Atomic Absorption Spectroscopy - The 7000 Series Methods and EPA CLP Inorganic Statement of Work describe single element determinations of analytes in solution using these techniques. The elements of arsenic, selenium, lead, thallium, and several others can routinely be determined at much lower levels of detection using graphite furnace atomic absorption (GFAA) than is possible using ICP. Solid samples for metals analysis require preliminary digestions by EPA methods which are referenced and detailed in SW-846.

Gas Chromatography/Mass Spectrometry (GC/MS) - Methods 8240 (or 8260) and 8270 determine volatile and extractable organic compounds, respectively, using chromatographic sample separation and mass spectrometric compound identification. Samples for volatiles may be directly purged onto absorbent materials, then desorbed and introduced into a chromatography column; or first extracted. Extraction methods are referenced and detailed in SW-846.

Gas Chromatography - Method 8080 determines aroclors of PCBs in liquid or solid matrices. Samples are extracted using a referenced SW-846 procedure, chromatographically separated, and the resulting chromatogram compared to known standards for analyte concentration determination.

3.3.2 Laboratory Documentation

Documentation of sample acceptance at the laboratory must be provided to the project manager following sample screening and log-in. This documentation may consist of signed copies of the chain of custody, or a letter detailing the field sample numbers accepted. Corresponding laboratory sample identification numbers should be provided to the project manager. The laboratory is required to have procedures for minimizing cross contamination of samples and securing sample custody within the laboratory.

All laboratory analyst notebooks, log sheets, instrument printouts, charts, calculations, etc., relevant to analyses of these samples shall be identified and remain retrievable. This information may be requested by the project manager or quality assurance officer for independent review and validation.

The analytical laboratory shall be required to submit summary reports of analytical results to the project manager. At a minimum the summary reports shall contain (1) laboratory review/approval date and signature; (2) date sample received; (3) sample preparation date; (4) sample analysis date; (5) preparation and analysis method reference; (6) field sample identification number; (7) laboratory sample identification number; (8) sample reporting or detection limit; (9) laboratory quality control sample results including calculated percent recoveries, relative percent differences, and self-imposed control limits, if applicable; and (10) dilution factors, if required for sample analysis.

3.4 QUALITY ASSURANCE/QUALITY CONTROL

The project manager is responsible for implementation of quality assurance (QA) policies and quality control (QC) procedures. A QA/QC officer, independent of this sampling and analysis task, will assume a quality assurance function and report to the project manager. The independent QA/QC officer is responsible for conducting quality assurance reviews to include second-level approvals of nonconformances and variances, primary approval of corrective actions, and audits of field and laboratory activities and documentation. Reports of all quality assurance review will be reported to the project manager. Quality assurance review may be requested by the project manager, or higher level management, or initiated by the individual responsible for the quality assurance function.

3.4.1 Field Quality Control

Field quality control activities will include collection of quality control samples in addition to the field documentation requirements previously discussed in Section 3.2.7. Quality control samples to be collected include duplicate samples, trip blanks, field blanks, and equipment rinsate blanks. Table 3-4 summarizes field quality control samples discussed in this project plan.

~~One~~ A pair of field duplicate sludge samples were ~~will be~~ collected from one of the ~~a randomly selected~~ locations of the first five samples at each surface impoundment. The field duplicate was ~~will be~~ collected using the same approximate location and designated ~~analyzed~~ for TAL ~~TCLP~~ metals and total volatile and BNA extractable organics (organic matrix spike/matrix spike duplicate) analyses. Frequency of duplicate field samples were ~~will be~~ no more than 1 per 20 samples, or the total number of samples collected per surface impoundment. Acceptance limits for field duplicate analyses are 0 to 20 percent relative difference (RPD) per analyte. Due to the

suspected heterogeneous nature of surface impoundment sludges, corrective action is not required for analyte RPDs exceeding 20 percent. However, poor total precision may indicate poor analytical precision, and reanalysis may be requested.

Representative organic compounds may be used by the laboratory in matrix spikes for total organic analysis. Acceptance criteria are not applied to matrix spike percent recoveries for total organic compounds; however, extreme bias shown by either very high or very low percent recoveries may indicate matrix interferences.

~~Confirmatory TCLP organics samples collected from the designated location in the northwest surface impoundment and nearest the influents of the other surface impoundments will be requested for full compound TCLP matrix spikes. Acceptance criteria are not applied to these matrix spikes, but the percent recoveries can be used to correct the analytical data.~~

Blank samples collected in the field will include trip blanks, field blanks, and ~~field~~ equipment rinsate blanks. Frequency of blank samples shall be no less than 1 in 20 samples, or 1 per surface impoundment.

Trip blanks will be prepared by the analytical laboratory from organic-free, deionized water. Two 40 ml volume VOA vials will be prepared per trip blank sample. Trip blanks will be taken to the sampling site and packed one pair per shipping cooler containing VOA samples. Trip blanks should be assigned a unique sample identification number for tracking purposes, but should not be identified as blanks to the analytical laboratory. Trip blanks are used to assess VOA sample

integrity and contamination which can occur during handling and transportation due to the permeable nature of the septa cap.

Field blanks will be prepared from organic-free, deionized water prepared in bulk from an analytical laboratory. Field blanks are used to assess sample contamination resulting from poor field techniques or poor ambient conditions at the site. One container of field-blank water should be taken to the field each sampling day that water samples are collected. Field-blank water is used to simulate sampling and should be collected and poured directly into sample containers for the water analysis parameters. Equipment rinsate blanks are used to assess sample contamination from improperly cleaned sample equipment.

Instrument calibration and maintenance are field activities subject to quality control procedures. Field equipment requiring calibration will be limited to radioactivity detection devices and organic vapor monitoring. Radiation monitoring equipment is the responsibility of field personnel and will be calibrated and maintained using the manufacturer's instructions and appropriate SOPs.

Field personnel will monitor for organic vapors in the surface impoundment area and may prescribe additional personal protective devices based upon these measurements. Monitoring shall be conducted for nonspecific organic vapors using either an HNU Photoionization Detector, Foxboro Organic Vapor Analyzer, or equivalent instrument. Prior to field activities the organic vapor will be calibrated by a trained technician using a calibration gas to check instrument response and ensure proper operation. Each day prior to monitoring at the site, the organic vapor analyzer shall be zeroed, set in an area free from organic vapors, response-checked using a

commercially available calibration gas, and then taken to the surface impoundment site for monitoring.

Field documentation is an integral part of quality assurance and quality control. Field documentation requirements and procedures are discussed in detail in Section 3.2.7 of this sampling plan.

3.4.2 Laboratory Quality Control

The analytical laboratory shall operate under a quality assurance program plan which meets the requirements of SW-846. Quality control procedures in the analytical laboratory are guided by the laboratory's quality assurance plan. Laboratory quality control issues, which are specific to this sampling and analysis plan and are addressed here, include laboratory quality control samples, documentation, and reporting requirements.

Laboratory quality control samples are required to establish the accuracy and precision of analytical data in order to determine the quality of the data. Laboratory performance indicated by laboratory quality control sample results gives indication of the need for corrective action and allows for evaluation of their effectiveness. Table 3-~~5~~ 4 lists laboratory quality control procedures.

~~For the TCLP parameters, one matrix spike is required per Method 1311 to represent the waste in any single surface impoundment. Results for the matrix spike are used to correct the analytical data for comparison to regulatory limits. Acceptance limits are not applied to TCLP matrix spikes; however, spike percent recoveries which exceed the range 50 to 150 percent recovery may~~

~~indicate matrix interferences. Corrective actions in the form of alternate analytical procedures may be requested.~~

At a minimum, the laboratory shall analyze calibration materials, method blank samples, organic surrogate blanks, and check standards, replicates, and matrix spike samples at the frequency indicated in Chapter 1 of SW-846. Acceptance criteria for organic surrogate spike analyses and organic laboratory performance sample analyses will be as specified in the appropriate analytical methods of SW-846. Additional laboratory quality control samples for determining bias (analytical accuracy) and precision for inorganic analyses conducted under this project plan are discussed below:

Accuracy. Analytical accuracy will be determined by analysis of duplicate laboratory control samples, with each analytical batch containing samples generated under this plan. Laboratory control samples are blank spikes containing the analytes of interest in a deionized-water matrix. Accuracy will be calculated as percent recovery or percent deviation from true value. Acceptance criteria for inorganic control samples are within 75 to 125 percent recovery or historical laboratory limits of plus or minus three standard deviations about the mean, whichever is more stringent.

Precision. Analytical precision will be determined by calculating the relative percent difference for parameters analyzed in the duplicate control samples. Relative percent difference is calculated as the absolute difference between the two results, divided by their mean, times 100. Precision is not mandated by SW-846, but this project will impose advisory precision limits of less than 20 RPD. Precision measurements exceeding that value may indicate corrective action.

The analytical laboratory will be notified of the quality control requirements for this sampling and analysis plan following the decision to proceed with the plan.

3.5 VARIANCES, NONCONFORMANCES, AND CORRECTIVE ACTIONS

Variances are deviations from approved work plans or procedures which are anticipated. Variance requests and approvals will be documented using a Variance Log (Figure 3-6 ~~9~~). All items recorded on the Variance Log require approval of the project manager and the quality assurance coordinator. Telephone or verbal approval from the project manager is sufficient to proceed with the variance. All variances must be documented.

Nonconformances are uncontrolled and unapproved deviations from approved procedures or project requirements. Nonconformances may be detected and identified by project personnel, laboratory personnel, or quality assurance personnel. Every nonconformance affecting quality will be documented on a Nonconformance Report Form (Figure 3-7 ~~10~~). Documentation shall include identification of the person detecting the nonconformance, description of the nonconformance, methods for correcting the nonconformance or description of the variance granted, and schedule for completing corrective action, if any. Nonconformances must be communicated to the project manager and the quality assurance coordinator. Nonconformance report approvals are required by the project manager by the quality assurance coordinator.

Corrective actions involving nonconformances which seriously affect data quality produced at the analytical laboratory and which are identified by project personnel must be transmitted in writing to the laboratory quality assurance director. The laboratory will be requested to develop a corrective action plan which address the nonconformances identified. Corrective actions

proposed by the laboratory are subject to the project manager and quality assurance coordinator's approvals prior to implementation.

Table 3-1

Sample Containers, Preservation, and Holding Times

Analyte Group	Water			Sediment/Soil/Sludge		
	Container	Preservative	Holding Time	Container	Preservative	Holding Time
Target Analyte List Metals (TAL)	~~1~~ 0.5 liter P	HNO_3 to pH <2	180 days (Hg - 26 days)	~~8 oz.~~ 125 ml ~~WM-G~~ P	Cool 4°C	6 months (Hg - 26 days)
Target Compound Volatile Organics	2 x 40 ml AG septa vials	HCL, Cool 4° C	14 days	2 x ~~120~~ 4 ml ~~G vial teflon lined cap No headspace~~ AG septa vials	Cool 4°C	14 days
Target Compound Semi-volatile Organics	~~2 x~~ 1 liter AG	Cool 4° C	7 days extraction, plus 40 days for analysis	~~8 oz.~~ 0.5 liter WM-G	Cool 4°C	7 days extraction plus 40 days for analysis
PCBs	~~2 x~~ 1 liter AG	Cool 4° C	5 days extraction, plus 35 days for analysis	~~8 oz.~~ 0.5 liter WM-G	Cool 4°C	14 days extraction plus 40 days for analysis
Radioactivity Screening	~~40 ml~~ 1 liter ~~AG G vial, no septa~~	None	Analyze upon receipt	~~120 ml~~ 1 liter ~~AG G vial~~	None	Analyze upon receipt
~~TCLP Metals~~	~~NA~~	~~NA~~	~~NA~~	~~2 L AG WM, 100 gram~~	~~None~~	~~180 days extraction plus 180 days for analysis (except Hg - 28 days to extraction plus 28 days for analysis)~~
~~TCLP Organics~~	~~NA~~	~~NA~~	~~NA~~	~~2 L AG WM~~	~~None~~	~~VOA - 14 day extraction plus 14 days for analysis; BNA - 14 day extraction plus 7 days to extraction plus 40 days for analysis~~

P - polyethylene WM-G - wide-mouth glass AG - amber glass G - glass AG-WM - amber glass, wide-mouth

Table 3-2

~~Toxicity Characteristic Metals,~~ Target Analyte Metals, Target Detection Limits, Analytical Methods, And Instrumentation

Analyte	Target Detection[b] Limit (µg/L)	EPA SW-846 Analytical Method	Instrumentation[c]
Aluminum	200	6010	ICP
Antimony	60	6010, 7041	ICP, GFAA
Arsenic[a]	10	6010, 7060	ICP, GFAA
Barium[a]	200	6010	ICP
Beryllium	5	6010, 7091	ICP, GFAA
Cadmium[a]	2	6010, 7131	ICP, GFAA
Calcium	5,000	6010, 7140	ICP, FAA
Chromium[a]	10	6010, 7191	ICP, GFAA
Cobalt	50	6010	ICP
Copper	25	6010	ICP
Iron	100	6010	ICP
Lead[a]	5	6010, 7420, 7421	ICP, FAA, GFAA
Magnesium	5,000	6010, 7450	ICP, FAA
Manganese	15	6010	ICP
Mercury[a]	0.2	7470, 7471	CVAA
Nickel	40	6010	ICP
Potassium	5,000	6010, 7610	ICP, FAA
Selenium[a]	5	6010, 7740	ICP, GFAA
Silver[a]	10	6010, 7760	ICP, FAA
Sodium	5,000	6010, 7770	ICP, FAA
Thallium	10	6010, 7841	ICP, GFAA
Vanadium	50	6010	ICP
Zinc	20	6010	ICP
~~TCLP~~	~~NA~~	~~1311~~	~~NA~~

[a] Toxicity characteristic metal.
[b] Detection limits listed are for clean water. Actual detection limits may be higher depending on sample composition and matrix type.
[c] ICP - Inductively Coupled Plasma Emission Spectroscopy
GFAA - Graphite Furnace Atomic Absorption Spectroscopy
FAA - Flame Atomic Absorption Spectroscopy
CVAA - Cold Vapor Atomic Absorption Spectroscopy

Table 3-3

Organic Compound Lists, Target Detection Limits[a], Analytical Methods, and Instrumentation

Analyte (Group)	Target Detection Limits	EPA SW-846 Analytical Method	Instrumentation
Target Compound List Volatiles + 10 Tentatively Identified Compounds (TICs)	10 µg/l water 10-120 µg/kg sediment	8240, or 8260	GC/MS
Target Compound List Semivolatiles + 20 TICs	10 µg/l water 330-50,000 µg/kg sediment	8270	GC/MS
PCBs	0.5 - 2.0 µg/l water 1.7 - 170 µg/kg sediment	8080	GC/EC

[a] Detection limits expressed as practical quantitation limits.

Table 3-4

Summary of Field Quality Control Samples

QC Sample Type	Sample Matrix	Applicable Analyses	Frequency	Purpose	Acceptance Criteria	Corrective[a] Action
Trip Blank	Water	Volatiles	~~One~~ ~~Two~~ per shipping cooler containing samples	Monitor sample contamination in field and lab	(b)	Advisory--no action required
Field Blank	Water	Semi-volatiles Pesticides/PCBs Metals, Radionuclides	One sample daily per analysis (can prepare and hold pending sample results)	Monitor field sample contamination/air contamination	(b) (c)	Advisory--no action required
Field Duplicate	Soil/Water	Volatiles	One per impoundment	Monitor sample variability	Analytical method criteria, if applicable	Advisory--no action required
Equipment Rinsate Blank	Water	Volatiles Semi-volatiles Pesticides/PCBs Metals, Radionuclides	One composite per day ~~impoundment~~ (can prepare and hold pending sample results)	Monitor decontamination effectiveness and sample cross contamination	(b) (c)	Advisory--no action required

[a]EPA Functional Guidelines for Data Validation may apply.

[b]For volatiles and semi-volatiles analysis, if blank shows detectable levels of any common laboratory contaminant (methylene chloride, acetone, 2-butanone, toluene, any phthalate ester), sample must exhibit that contaminant at a level ≥10x the quantitation limit to be considered detectable. For all other contaminants, sample must exhibit the contaminant at a level ≥5x the quantitation level to be considered detectable.

[c]For pesticides analysis, if blank shows detectable level of any contaminant, sample must exhibit that contaminant at a level ≥5x the quantitation limit to be considered detectable.

Table 3-5

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Volatile Organics	8240 or 8260	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours of analysis time	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels; after each instrument performance, check prior to sample analysis	Relative response factors (RRF) within method limits	Repeat calibration
		Continuing calibration	Every 12 hours of analysis time	Average RRFs <25% difference	Repeat calibration
		Internal standards	All calibration standards, samples, and blanks	Extracted ion current profile (EICP); Δ -50% to +100% Retention time shifts <0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Every 12 hours of analysis time	< 5 times quantitation limit for methylene chloride, acetone, 2-butanone; all other compounds < or = to quantitation limit	Determine source of contamination, and document corrective action; re-extract and re-analyze samples

Table 3-5, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Volatile Organics (cont'd)	8240 or 8260	System monitoring compounds	Every method blank, sample, matrix spike, matrix spike duplicate; matrix specific, per method limits	Check instrument and calculations; re-analyze per method criteria	
Target Compound Semi-Volatile Organics	8270	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels. After each performance, check prior to sample analysis	RRFs within method limits	Repeat calibration
		Continuing calibration	Every 12 hours	Average RRFs <25% difference	Repeat calibration
		Internal standards	All calibration standards, samples and blanks	EICP Δ -50% to +100% Retention time shifts < 0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Each group of samples of similar matrix and concentration level (soils)	< 5 times quantitation limit for phthalate esters; all other compounds < or o= to quanitation limit	Determine source of contamination; document corrective action; re-extract and re-analyze samples

Table 3-5, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Semi-Volatile Organics (cont'd)	8270	Surrogate Compounds	Each sample, blank	Matrix specific per method limits	Re-extract and re-analyze per method criteria
Organochlorine Pesticides and PCBs	8080	GC Column Resolution	Prior to each initial calibration, or each column and instrument	Per method criteria	Change column, detector, clean system, etc.; repeat procedure
		Initial calibration	Three concentration levels calibration sequence prior to sample analysis after resolution check	Calibration factors and retention times must meet method criteria	Repeat calibration
		Continuing calibration	Every 12 hours	Calibration factors and retention times must meet method criteria	Repeat calibration
		Method blank	One per field batch, every 20 samples, every 14 days, or whenever similar extraction method used; whichever more frequent	All analytes less than quantitation limits, retention times within windows	Re-extract and re-analyze all associated samples

Table 3-5, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Organochlorine Pesticides and PCBs (cont'd)	8080	Instrument blank	First analysis every 12 hours following calibration	Less than 0.5 times quantitation limits, retention times within windows; surrogates acceptable	Correct malfunction; repeat calibration sequence, re-analyze blank, re-inject all associated samples
		Sulfur clean-up blank	Each sample set requiring sulfur clean-up	All analytes less than quantitation limits; surrogate retention times within windows	Re-extract and re-analyze all associated samples
		Surrogate compounds	Each sample and blank	60% - 150% recovery	Advisory only--no action
Metals	6010	Instrument calibration	Daily, or each setup	±5% true value	Repeat calibration
		Initial/continuing calibration	After instrument calibration, 10% or every two hours	±10% true value	Correct problem, re-calibrate and re-analyze previous ten samples
		Initial/continuing calibration blank	Every calibration, 10% or two hours	< contract required detection limits	Correct problem; re-calibrate and re-analyze all samples since last blank
		Preparation blank	Each batch of digested samples	< contract required detection limits	Re-digest and re-analyze all associated samples per method criteria
		Interference check sample	Each run or twice per eight-hour shift	±20% of true value	Correct problem; re-calibrate, re-analyze all samples since last ICS

Table 3-5, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Metals (cont'd)	6010	Duplicate sample analysis	Once per field batch per matrix	0%-20% RPD when < five times detection limit; ± detection limit otherwise	Flag data
		Laboratory control sample	Once per field batch or each digest group	80% - 120% percent recovery (except Ag, Sb)	Correct problem; re-digest and re-analyze all samples since last LCS
		Serial dilution analysis	Once per field batch per matrix	± 10% original determination	Flag data
		Instrument detection limit	Quarterly	As determined	Not applicable
		Inter-element corrections	Annually	As determined	Not applicable
		linear range analysis	Quarterly	± 5% true value	Re-analyze
~~TCLP Metals and Organics~~	~~1311~~ ~~6010~~ ~~7000 Series~~ ~~8260~~ ~~8270~~	~~Per analytical methods~~	~~Per analytical methods~~	~~Per analytical methods~~	~~Per analytical methods~~

[a]Source: EPA Contract Laboratory Program Statement of Work for Inorganic and Organic Analysis (3/90). Not all listed procedures may be applicable to SW-846 protocols.

HAZARDOUS MATERIALS TRANSFER FORM

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

HM No. 37551	SM No.	Date

Complete entire form. Please type or print. UPON DELIVERY, FORWARD THIS FORM TO THE HAZPACT OFFICE, MS: G726

FROM				
Name				
Telephone	Group	TA	Build.	Room

TO				
Name				
Telephone	Group	TA	Build.	Room

Check all that apply. Refer to 49 CFR 173.50 for hazard class definitions.

- ☐ 1.1 Explosives
- ☐ 1.2 Explosives
- ☐ 1.3 Explosives
- ☐ 1.4 Explosives
- ☐ 1.5 Very Insensitive Explosives:Blasting Agents
- ☐ 1.6 Extremely Insensitive Detonating Substances
- ☐ 2.1 Flammable Gas
- ☐ 2.2 Non-Flammable Compressed Gas
- ☐ 2.3 Poisonous Gas
- ☐ 3 Flammable and Combustible Liquid
- ☐ 4.1 Flammable Solid
- ☐ 4.2 Spontaneously Combustible Material
- ☐ 4.3 Dangerous When Wet
- ☐ 5.1 Oxidizer
- ☐ 5.2 Organic Peroxide
- ☐ 6.1 Poisonous Materials
- ☐ 6.2 Infectious Substance (Etiologic Agent)
- ☐ 7 Radioactive Material
- ☐ 8 Corrosive Material
- ☐ 9 Miscellaneous Hazardous Material
- ☐ Other Regulated Material

Form of Material
- ☐ Solid
- ☐ Liquid
- ☐ Compressed Gas
- ☐ Uncompressed Gas
- ☐ Cyrogenic Material
- ☐ Metal
- ☐ Powder

Chemical Name

Quantity per Container

Is this material a limited quantity? ☐ Yes ☐ No *If you do not know the definition of a limited quantity for the hazard class of your material, contact HAZPACT at 7-4127.* If your answer is yes complete and prepare your transfer per the instructions in 49 CFR for limited quantities. If your answer is no, and you do not have a Standard Operating Procedure approved by the HAZPACT Office for this category of material, then contact a HAZPACT Operations Representative at 7-4127 Radioactive shipments must include the identification of radionuclide, packaging identification, activity, transport index, and type of label applied.

No. of Pkgs.	Packaging Used	Proper Shipping Name	Hazard Class & Division	UN/NA Number	Packaging Group	Qty. or Residue	Gross Weight

TRANSPORTATION: THIS MATERIAL IS TO BE TRANSPORTED ONLY IN GOVERNMENT VEHICLES!

I certify that the above information is correct and that this transfer contains no hazardous materials other than those listed. This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. Signature:

Delivered By (Nuclear Material Handler) Signature	Received By (Receiving Custodian) Signature	Date

Placard(s) Required ☐ Yes ☐ No Label(s) Required ☐ Yes ☐ No

ADDITIONAL RADIOACTIVE MATERIAL INFORMATION REQUIRED

Transport Index:	Chemical Form:	Physical Form:

Radionuclide(s) _____
Curies _____
Grams _____
Type Of Label Required: _____

Radiation Levels
Contact _____ mR/hr
_____ mrem/hr
Total _____

At 1 Meter _____ mR/hr
_____ mrem/hr
Total _____

Exterior surfaces are free from removable contamination.

Tamper ID.	Nuclear Material ☐ Yes ☐ No

Health Physics Representative	Pro-Force Signature	Date

Form 1468 (4/91) ST 5052

Figure 3-1. Hazardous Materials Transfer Form.

INTERNATIONAL TECHNOLOGY CORPORATION

F
H R

Project Name _____

Project No. _____

Sample No. _____

Collection Date/Time _____

Collector's Name _____

Sample Location _____

Sample Type/Depth/Description _____

Analyze For _____ Preservative _____

Bottle _____ of _____ _____ Filtered _____ Nonfiltered

23-8-85

Figure 3-2. Sample Label.

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	
TIME	
PAGE ____ OF ____	
PAGE	
PROJECT NO.	

SAMPLE COLLECTION LOG

PROJECT NAME _____

SAMPLE NO. _____

SAMPLE LOCATION _____

SAMPLE TYPE _____

COMPOSITE _____ YES _____ NO

COMPOSITE TYPE _____

DEPTH OF SAMPLE _____

WEATHER _____

CONTAINERS USED	AMOUNT COLLECTED

COMMENTS:

PREPARED BY: _____

Figure 3-3. Sample Collection Log.

COMMENTS: (Continued)

DATE	
TIME	
PAGE ____ OF ____	
PAGE	
PROJECT NO.	

PREPARED BY: _____

LEGEND

1. A SAMPLE COLLECTION LOG IS TO BE COMPLETED FOR EACH SAMPLE.
2. ALWAYS COMPLETE BOTH SIDES. IF SECOND SIDE IS NOT USED, DRAW A LINE THROUGH IT AND MARK N/A. FILL IN CONTROL BLOCK AND PREPARED BY.
3. ALL ENTRIES ON LOG ARE TO BE COMPLETED, IF NOT APPLICABLE MARK N/A.
4. DATE: USE MONTH/DAY/YEAR; I.E., 10/30/85
5. TIME: USE 24-HOUR CLOCK; I.E., 1835 FOR 6:35 P.M.
6. PAGE: EACH SAMPLE TEAM SHOULD NUMBER PAGE _____ OF _____ FOR THE DAY'S ACTIVITIES FOR ALL SHEETS PREPARED ON A SINGLE DAY, I.E., IF THERE ARE A TOTAL OF 24 PAGES (INCLUDING FRONT AND BACK) NUMBER 1 OF 24, 2 OF 24, ETC.
7. SAMPLE LOCATION: USE BORING OR MONITORING WELL NUMBER, GRID LOCATION (TRANSECT), SAMPLING STATION I.D., OR COORDINATE TO PHYSICAL FEATURES WITH DISTANCES. INCLUDE SKETCH IN COMMENT SECTION IF NECESSARY.
8. SAMPLE TYPE: USE THE FOLLOWING - SOIL; WATER (SURFACE OR GROUND); AIR (FILTERS, TUBES, AMBIENT, PERSONNEL); SLUDGE; DRUM CONTENTS: OIL; VEGETATION; WIPE; SEDIMENT.
9. COMPOSITE TYPE: I.E., 24-HOUR, LIST SAMPLE NUMBERS IN COMPOSITE, SPATIAL COMPOSITE.
10. DEPTH OF SAMPLE: GIVE UNITS, WRITE OUT UNITS SUCH AS INCHES, FEET. DON'T USE ' OR ".
11. WEATHER: APPROXIMATE TEMPERATURE, SUN AND MOISTURE CONDITIONS.
12. CONTAINERS USED: LIST EACH CONTAINER TYPE AS NUMBER, VOLUME, MATERIAL (E.G., 2 - IL GLASS; 4 - 40 ML GLASS VIAL; 1 - 400 ML PLASTIC; 1 - 3 INCH STEEL TUBE; 1 - 8 OZ. GLASS JAR).
13. AMOUNT COLLECTED: VOLUME IN CONTAINERS (E.G. 1/2 FULL).

125-10-85

Figure 3-3 (continued). Sample Collection Log.

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. _____

C/C Control No. 158010

PROJECT NAME/NUMBER _____ LAB DESTINATION _____

SAMPLE TEAM MEMBERS _____ CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.

Special Instructions: _____

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: _____

   Received By: _____

2. Relinquished By: _____

   Received By: _____

3. Relinquished By: _____

   Received by: _____

4. Relinquished By: _____

   Received By: _____

WHITE - To accompany samples
YELLOW - Field copy

Figure 3-4. Chain-of-Custody Record.

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 207868

C/C Control No. _____

PROJECT NAME _____

PROJECT NUMBER _____

PROFIT CENTER NUMBER _____

PROJECT MANAGER _____

BILL TO _____

PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED _____

LAB DESTINATION _____

LABORATORY CONTACT _____

SEND LAB REPORT TO _____

DATE REPORT REQUIRED _____

PROJECT CONTACT _____

PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)

Normal _____ **Rush** _____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)

I _____ **II** _____ **III** _____ **Project Specific** _____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)

Non-hazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** _____ **(Please Specify)**

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)

Return to Client _____ **Disposal by Lab** _____ **Archive** _____ **(Indicate number of months.)**

FOR LAB USE ONLY

Received by _____ **Date/Time** _____

WHITE - Original, to accompany samples

YELLOW - Field

126A-10-85

Figure 3-5. Request for Analysis Form.

301215.01.13

INTERNATIONAL TECHNOLOGY CORPORATION

VARIANCE NO. _____

VARIANCE LOG

PROJECT NO. _____

PAGE ___ OF___

PROJECT NAME _____

DATE:_____

VARIANCE (INCLUDE JUSTIFICATION)

APPLICABLE DOCUMENT:

CC:

REQUESTED BY: _____ Date: _____

Approved By: _____ Date: _____
Project Manager

_____ Date: _____
Quality Assurance Officer

_____ Date: _____

Figure 3-6. Variance Log.

301215.01.13

INTERNATIONAL TECHNOLOGY CORPORATION

NONCONFORMANCE REPORT

NCR NO. _____

PROJECT NO. _____ PAGE ____ OF____

PROJECT NAME _____ DATE:_____

NONCONFORMANCE:

IDENTIFIED BY: _____ DATE: _____

CORRECTIVE ACTION REQUIRED:

TO BE PERFORMED BY: _____ DATE: _____

MUST CORRECTION BE VERIFIED? YES _____ NO _____

TO BE VERIFIED BY: _____ PREPARED BY; _____ DATE: _____

CORRECTIVE ACTION TAKEN:

PERFORMED BY: _____ Date: _____

VERIFIED BY: _____ Date: _____

CC:

Approved By: _____ Date: _____

_____ Date: _____

Figure 3-7. Nonconformance Report.

4.0 WASTE MANAGEMENT PRACTICES

4.1 SURFACE IMPOUNDMENTS TA-53-166 NORTHEAST AND NORTHWEST

4.1.1 Design Standards

TA-53-166 NE and NW were constructed in 1969. These impoundments are lined with bentonite clay bottoms and Gunite sides. They are both 210 feet in length by 210 feet in width and 6 feet deep, with liquid storage capacities of 1,629,144 gallons each. Figures 4-1, ~~and~~ 4-2, ~~and 4-7~~ show the "as-built" details for these two impoundments.

4.1.1.1 Dike and Impoundment Design and Construction

The surface impoundments dikes were constructed of materials obtained on-site by excavating and pulverizing the welded volcanic tuff bedrock (Bandelier Tuff). The Bandelier Tuff in this area is an ashfall and ashflow tuff which was welded to varying degrees. The pulverized tuff is essentially a cohesionless soil (Boyd, 1966) which was placed in layers and compacted to 90% of the maximum density as defined by the Modified Proctor (ASTM D1557).

The impoundments were built with side slopes of 2:1 (horizontal:vertical). The base elevation of both impoundments is 6,916 feet above sea level (a.s.l.), with maximum water elevations of 6,920 feet a.s.l. The elevation at the top of the berms ranges from a minimum of 6,922 feet a.s.l. on the south, east, and west sides to 6,927 feet a.s.l. on the north side. There is a 32-foot-wide berm separating the two impoundments.

4.1.1.2 Liner Design

The liners in the two north impoundments consist of a four-inch layer of bentonite clay on the base of the impoundment and a Gunite liner on the sidewalls. The clay liners were compacted to 95% of the maximum density as defined by the Modified Proctor (ASTM D1557). Typically, bentonite clay liners compacted to 95% of the Modified Proctor should yield a permeability of less than the standard 1×10^{-7} cm/sec. The four-inch-thick bentonite clay liners at the north impoundments are expected to have a saturated hydraulic conductivity of approximately 10^{-10} cm/sec (Fernandez et al., 1987). ~~However, no documentation has been found which confirms the hydraulic conductivity meets the standard of 1×10^{-7} cm/sec.~~ The Gunite liners consist of approximately four to six inches of cement slurry without aggregate (shotcrete) which was sprayed onto the sides of the impoundments.

4.1.2 Structural Integrity

4.1.2.1 Stability Analysis of Dikes

A search for design/construction quality control information and literature regarding the two north surface impoundments has been performed. However, little information was available. LANL is currently pursuing a contract for geotechnical evaluation of dike integrity of all three impoundments. The information to be collected will include the results of geotechnical testing performed to determine the physical properties of the impoundment dikes, soils and foundation materials, construction quality control records, and geologic maps. This information will be used in performing a stability analysis of the impoundment dikes. Geotechnical characterization will most likely include soils/rock testing of foundation materials (i.e., volcanic tuff) and fill materials used to construct the impoundment dikes and bentonite clay liners. The soils/rock testing will probably consist of laboratory tests for:

- Sieve analyses, Atterberg limits (plasticity),
- Permeability tests,
- Consolidation tests,
- Triaxial tests and strength testing,
- Direct shear,
- Density and in situ moisture content,
- Standard penetration testing-blow counts (field testing during borings),
- Maximum laboratory density (Proctor),
- Compaction testing,
- Material compliance-sieve analysis, Atterberg limits, etc.,
- Construction observation records, and
- As-built plans.

Stability analysis will be included in the geotechnical evaluation that LANL will subcontract.

~~It is anticipated that stability analysis will be completed within six months from the date of this submittal.~~

4.1.2.2 Bearing Capacity

The information required to determine the bearing capacity of the foundation materials can be obtained through either cone penetrometer tests (CPT), classification tests, strength tests, or geotechnical correlations. A site investigation will be conducted to obtain the necessary information for bearing capacity analysis as part of the proposed geotechnical investigation.

4.1.2.3 Settlement Potential

An engineering evaluation of consolidation, strength, and classification tests will be performed to evaluate the potential for differential settlement of the foundation materials due to the loads imposed by the impoundments. The indicated tests will be conducted prior to the evaluation of differential settlement potential as part of the proposed geotechnical investigation.

4.2 SURFACE IMPOUNDMENT TA-53-166 SOUTH

4.2.1 Design Standards

TA-53-166 S was constructed in 1985 and is lined with Hypalon (36 mil thick). This impoundment is approximately 305 feet in length and 148 feet in width and is 6 feet deep, with a liquid storage capacity of 2,580,000 gallons. The initial design drawings are provided on Figures 4-3, 4-4, and 4-5; Figure 4-6 shows the "as built" details for this impoundment. ~~No "as built" drawings are available; however, the initial design drawings provided in Figures 4-3, 4-4, and 4-5 represent the final construction.~~ The engineering certification is included as Appendix B.

4.2.1.1 Dike and Impoundment Design and Construction

The surface impoundment dikes were constructed of soils obtained on-site by excavating and pulverizing the welded volcanic tuff bedrock (Bandelier Tuff). The tuff is described in Section 4.1.1.1. The pulverized tuff was placed in layers up to eight inches in loose thickness. Each layer was then compacted to at least 90% of the maximum density Modified Proctor (ASTM D1557). The top layer consisted of twelve inches of pulverized tuff and was compacted to at least 95% of the maximum density Modified Proctor (ASTM D1557). A six-inch sand cushion layer was placed over the compacted soils in the bottom of the impoundment. This material was compacted to at least 85% of the maximum density Modified Proctor (ASTM D1557). The surface

of the cushion layer was to be free of all sharp points and edges so that the liner could be placed on a smooth and uniform surface. The specifications required that the compacted soils be tested for compaction and confirmed to the specification at least once for every 2,000 square feet of area and at least three times. Results of nuclear density tests performed at various locations in and around this impoundment are given in Appendix C. Nuclear density tests are used to determine the compaction of soil fill materials.

The impoundment was built with side slopes of 2:1 (horizontal:vertical). The base elevation of the impoundment is 6,910.5 feet a.s.l., with a maximum water elevation of 6,914.5 feet a.s.l. The elevation at the top of the berms ranges from a minimum of 6,917 feet a.s.l. on the south side to 6,922 feet a.s.l. on the north side.

4.2.1.2 Liner Design

The south surface impoundment is lined with a thermoplastic elastomeric lining material consisting of one ply of fabric reinforcement encapsulated by two plies of Hypalon rubber sheeting. The reinforcing fabric is a 10 X 10 - 1000 denier polyester scrim with a plain weave. The rubber sheeting is compounded using Dupont Hypalon 45 rubber polymer specifically formulated for low water absorption. The liner originally had a twenty-year design life.

The Hypalon liner, which typically has a saturated hydraulic conductivity of 10^{-11} cm/sec, is 0.036 inches (36 mils) thick. The construction specifications were as follows. The breaking and tear strength, using Test Methods ASTM D751-Grab Method and Tongue Tear, were 200 pounds and 80 pounds, respectively. The hydrostatic resistance specifications of the liner was 250 pounds per square inch (psi) using Test Method ASTM D751, Method A, Procedure 1. The water

absorption specifications, from Test Method ASTM D471, is 2% maximum (U.S. Department of Energy, 1985).

The liner was installed in panels which were a minimum of 14,000 square feet and a maximum of 25,000 square feet to minimize the number of field seams required. For the field seams, a minimum overlap of six inches was required. All field seams were sealed with a bodied solvent adhesive and inspected after a 24-hour curing period to ensure the quality of the seaming. The liner anchor trench details, as well as the field seam and structural steel details, are shown in Appendix D (Liner Details).

4.2.2 Structural Integrity

See Sections 4.1.2.1, 4.1.2.2, and 4.1.2.3.

4.3 SURFACE IMPOUNDMENT OPERATION AND MAINTENANCE

The NE and NW impoundments were originally planned as retention impoundments. After their construction, however, the impoundments were frequently at a capacity which required discharges to be made. Growth in the contributing population meant that a third impoundment would need to be constructed to allow the system to continue as retention/evaporation impoundments. The south impoundment was constructed but was then diverted into service as a total retention radioactive liquid waste storage impoundment.

The two-impoundment system is rated at 120,000 gallons per day on a flow-through treatment basis. Although the piping is arranged to operate the impoundments in any configuration, normal operation is for flow to proceed through the system from the northwest impoundment to the

northeast impoundment. The system is operated in a batch mode, with discharges occurring two or three times a year to Los Alamos Canyon through a National Pollutant Discharge Elimination System (NPDES) outfall, NPDES Serial No. 09S. (Historical information indicates that before the south impoundment was constructed, discharges from the north impoundments due to overfilling occurred on a fairly frequent basis). When the decision is made to discharge to the outfall, effluent is sampled according to EPA Form 2C (NPDES) instructions. Parameters include biological oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon (TOC), and total suspended solids (TSS), as well as pollutants specified in the NPDES permit. Chlorine is sometimes added to the impoundments to reduce the TSS and BOD below the NPDES limits before discharge.

The NE and NW impoundments are each equipped with two AquaAerobics surface turbine aerators for purposes of aeration and enhanced evaporation. This minimizes the volume of water discharged to the outfall. In the winter, ice forms on these impoundments and the aerators are turned off. The aerators are also turned off when a discharge to the outfall is occurring to prevent unnecessary disturbance of sludge and other bottom sediments.

On occasion, clean water ~~from the north impoundments~~ is added ~~diverted~~ to the ~~adjacent~~ south impoundment to prevent ~~the latter~~ it from drying out, to keep the liner weighted down, and to avoid concentrating radioactivity to unsafe levels. ~~and to maintain appropriate liquid levels in the north impoundments. To accomplish a diversion, the gate between the northwest and northeast impoundments is closed, and the gate in the distribution box which leads to the south impoundment is opened for as long as necessary to divert the desired amount of water.~~

In the past, liquid radioactive wastewater was discharged to the two north impoundments. Special provisions have therefore been adopted for working in the area of the impoundments. This includes treating all equipment associated with the impoundments as radioactive, and working in close coordination with the Health Physics Operations Group, HS-1, when disposing of this equipment or working in the area of the impoundments.

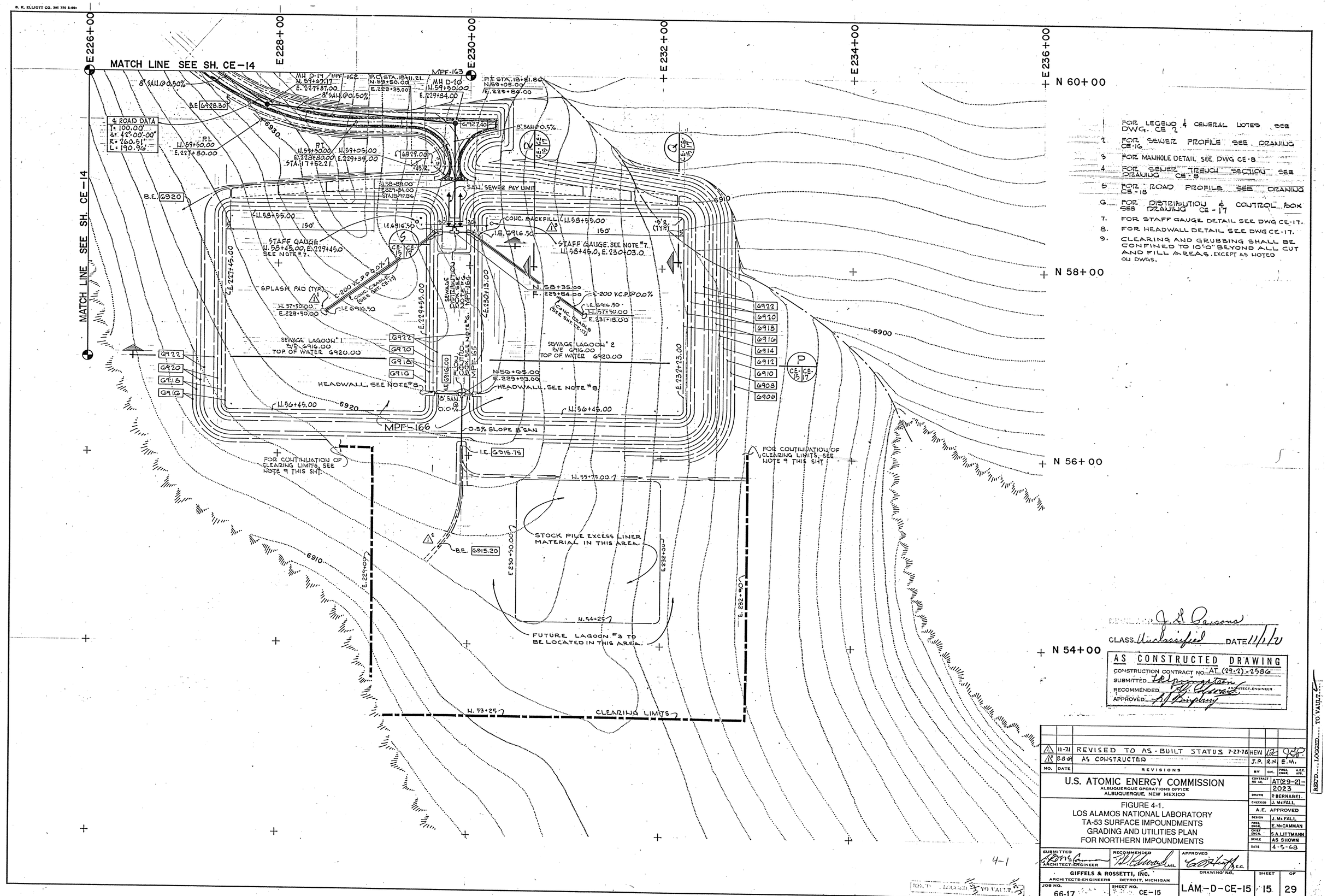
Long-term plans for sanitary waste management at TA-53 are to tie the TA-53 sanitary waste lines into consolidated sewer lines to the main wastewater treatment plant at TA-3, and discontinue use of the two northern impoundments. It is anticipated that construction on a new forcemain along East Jemez road from TA-53 to a TA-3 lift station will begin during calendar year 1992.

4.3.1 Overtopping Controls

The maximum water level in the impoundments was set to allow for at least two feet of freeboard. The 100-year, 24-hour storm event for the region is approximately three inches. Therefore, in the event of a 100-year, 24-hour storm, multiplied by 1.3 to account for runoff from the dikes, the freeboard would be at 20.1 inches, or 1.675 feet. The freeboard is visually inspected on a daily basis.

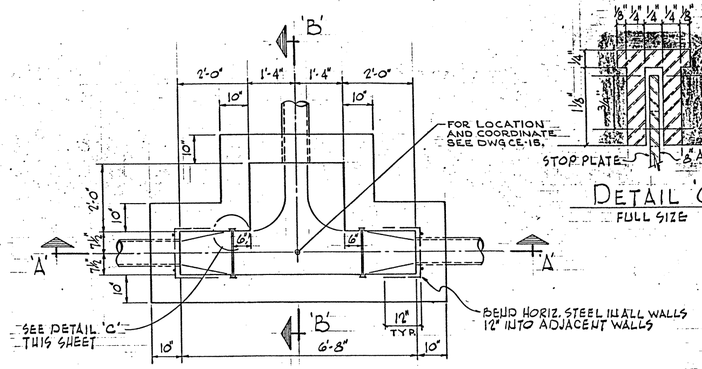
There is a pipe in the NE impoundment that would allow discharge out the permitted NPDES outfall in the event the impoundment reached high levels. However, it is still necessary to perform inspections for freeboard since there is a potential for overtopping if influent or precipitation exceeds the flow capacity of the NPDES discharge.

B. K. ELLIOTT CO. 301 750 2-66



4276-E

B. K. ELLIOTT CO. 301 750 2-66



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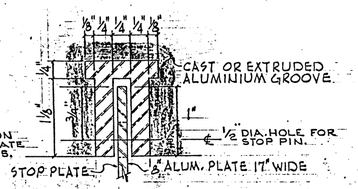
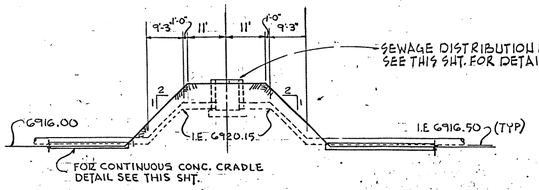


DETAIL 'C'
FULL SIZE



SECTION (5) CE-15 | CE-17
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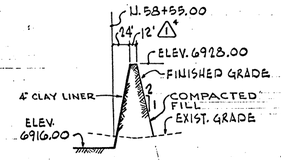
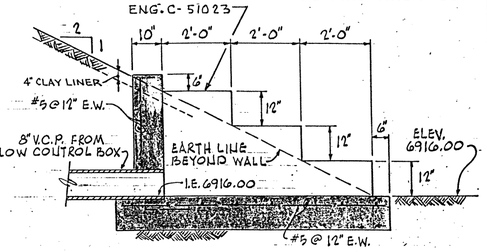
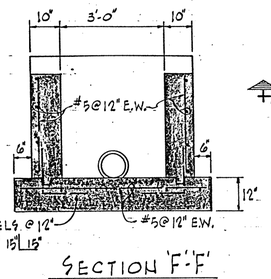


SECTION (R) CE-15 | CE-17
SCALE HORIZ 1"=100' VERT. 1"=10'

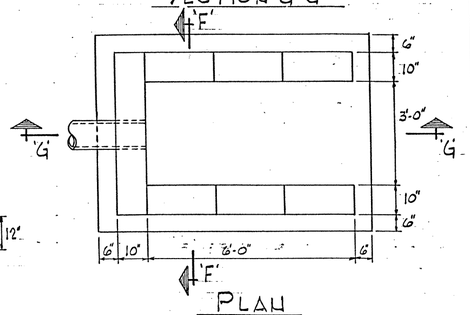
FOR MODIFICATION TO THIS AREA SEE ENG. C-51023



SECTION G-G



SECTION 'F'-'F'



PLAN

FOR LOCATION SEE DRAWING CE-15.

LAGOON HEADWALL DETAIL MPF-166
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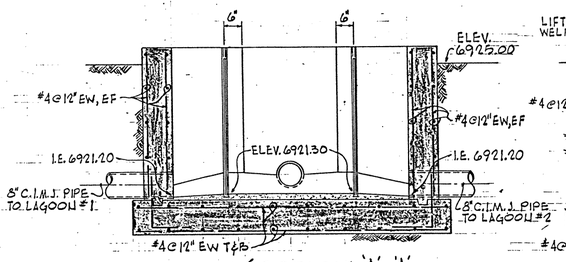
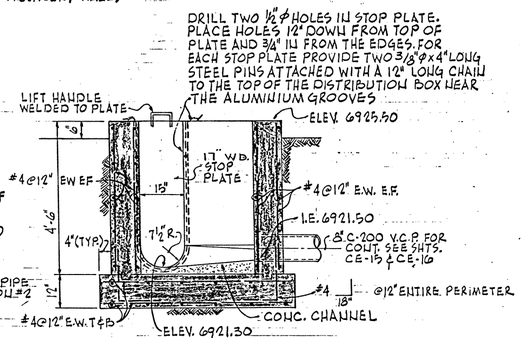


SECTION 'A'-'A'



SECTION 'B'-'B'

SEWAGE DISTRIBUTION BOX MPF-164
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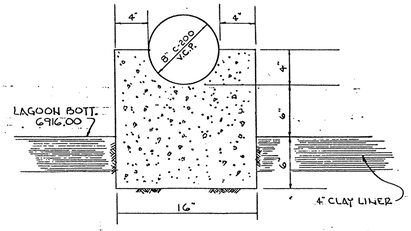

CONC. CRADLE DETAIL
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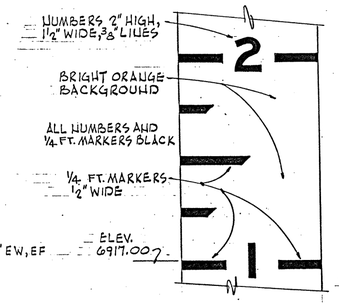

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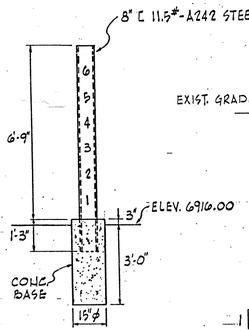

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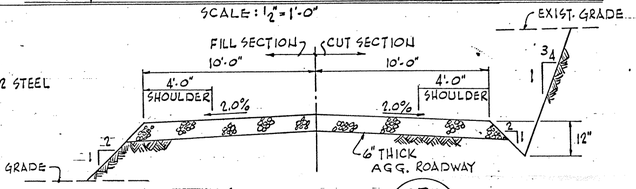
STAFF GAUGE DETAIL
FOR LOCATION SEE DRAWING CE-15.



SECTION (3) CE-14,15 | CE-17
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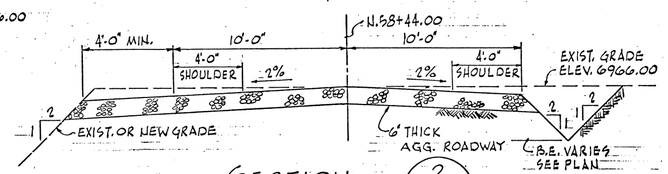

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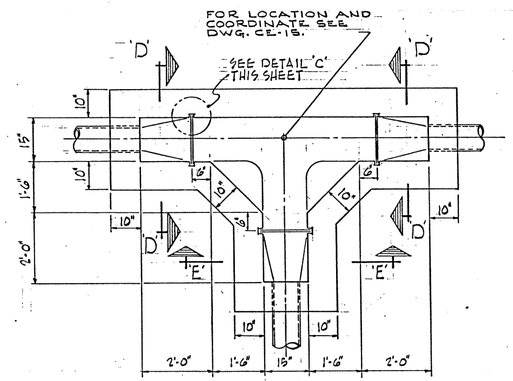

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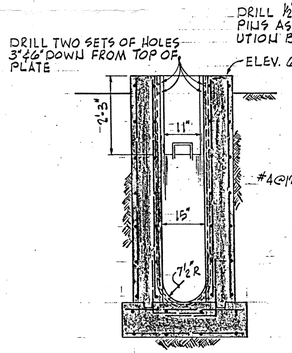

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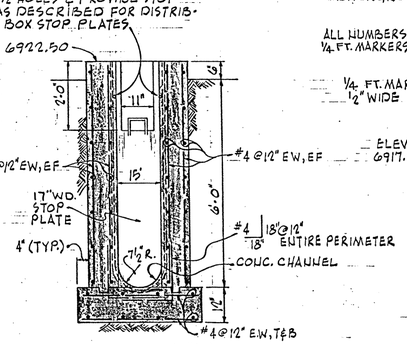

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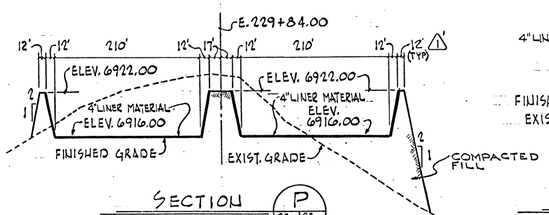

SECTION (P) CE-15 | CE-17
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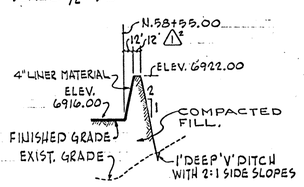

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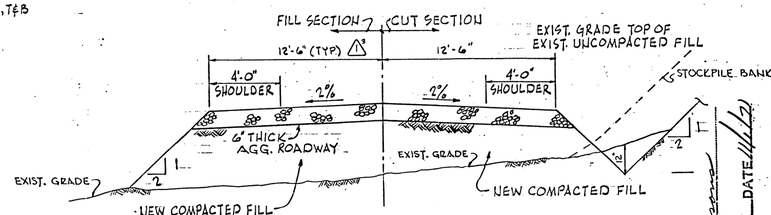


NOTE: FOR THE EXTENT OF THE EXIST. UNCOMPACTED FILL SEE SHT. CE-18

SECTION (1) CE-15 | CE-17
SCALE HORIZ. 1"=4' VERT. 1"=2'

AS CONSTRUCTED DRAWING
CONSTRUCTION CONTRACT NO. AT(29-2)-2586
SUBMITTED
RECOMMENDED
APPROVED

NO.	DATE	REVISIONS	BY	CH.	PROJ. ENGR.	A.E.C. APP.
2	11-71	REVISED TO AS BUILT STATUS AS OF 7-27-70	JREW			
1	5-8-69	AS CONSTRUCTED	J.W.P.	RWHEZM		

U.S. ATOMIC ENERGY COMMISSION
ALBUQUERQUE OPERATIONS OFFICE
ALBUQUERQUE, NEW MEXICO

FIGURE 4-2.
LOS ALAMOS NATIONAL LABORATORY
TA-53 SURFACE IMPOUNDMENTS
UNDERGROUND UTILITY DETAILS AND
SITE DETAILS FOR NORTHERN IMPOUNDMENTS

CONTRACT NO. AT(29-2)-2023
DRAWN J.W.PFAENDTNER
CHECKED R. NOGAS
A.E. APPROVED
DESIGN J. McFALL
PROJ. ENGR. E. McCAMMAN
CHIEF ENGR. S. LITTMANN
SCALE AS SHOWN
DATE 4-5-68

SUBMITTED ARCHITECT-ENGINEER
RECOMMENDED
APPROVED A.E.C.

GIFFELS & ROSSETTI, INC.
ARCHITECTS-ENGINEERS DETROIT, MICHIGAN

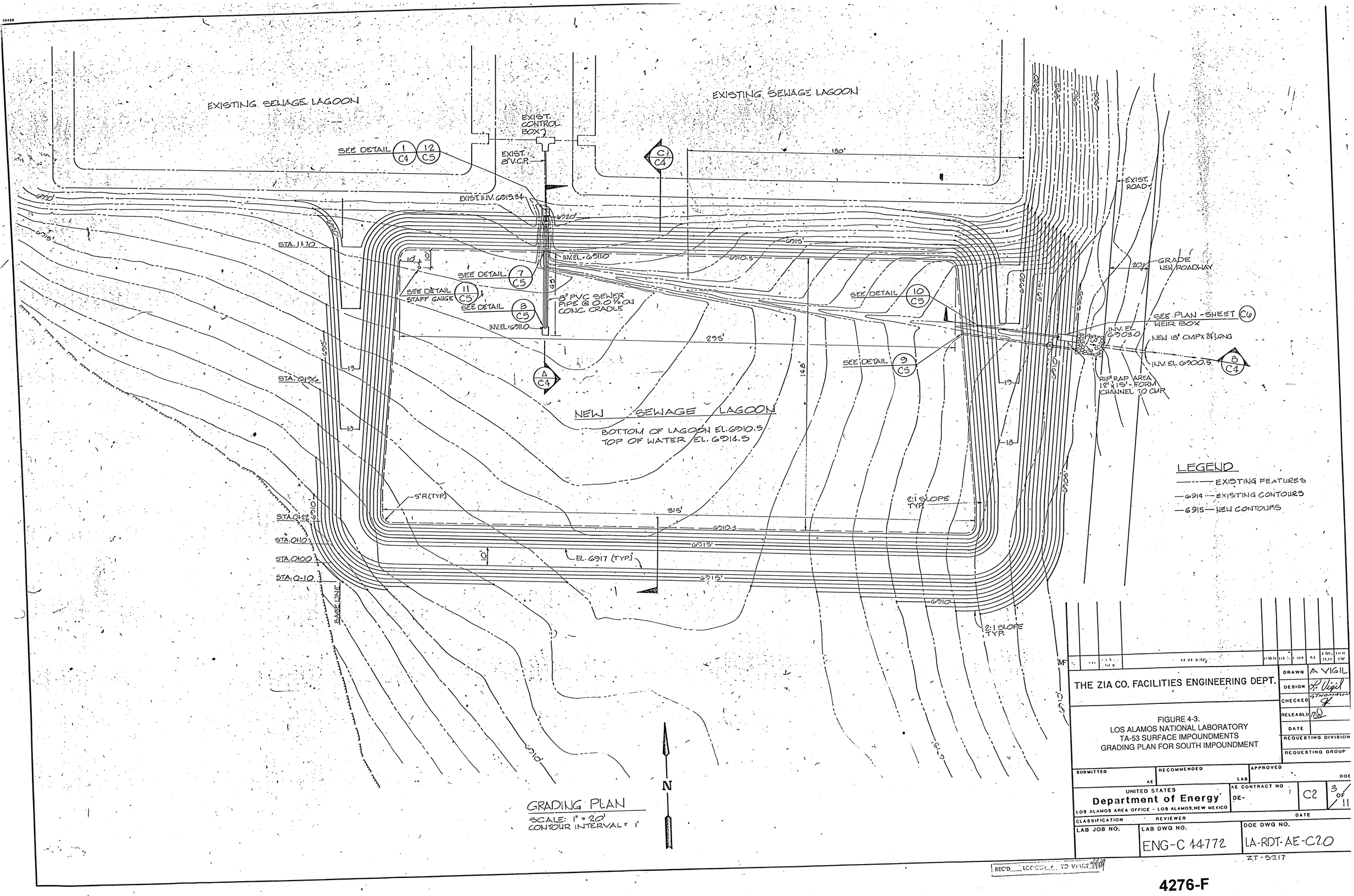
JOB NO. 66-17
SHEET NO. CE-17
DRAWING NO. LAM-D-CE-17
SHEET 17 OF 29

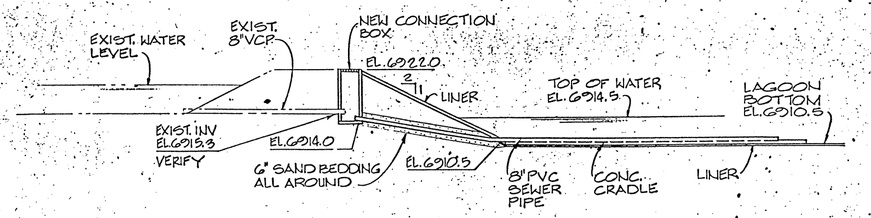
4-2

CLASS Unclassified DATE

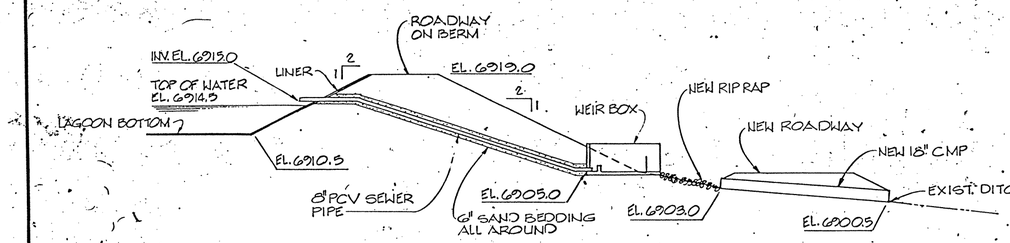
LAB JOB 2856 ENG-C 57817

4276-G

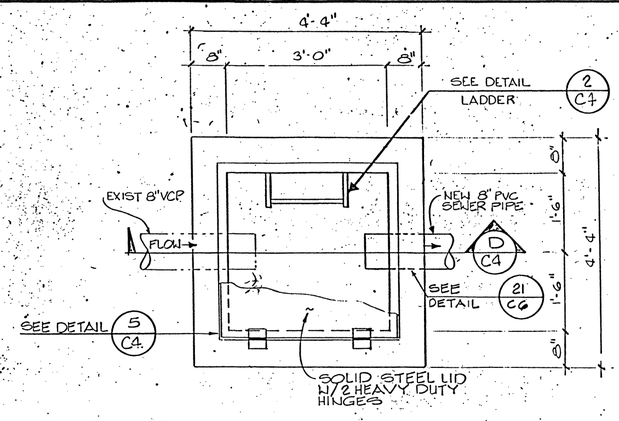

EXISTING SEWAGE LAGOON
EXISTING SEWAGE LAGOON
EXIST. CONTROL BOX
SEE DETAIL 1/C4 12/C5
EXIST. 8" V.C.P.
C1/C4
180'
EXIST. ROAD
EXIST. INV. 6915.34
6920'
6915'
6910'
STA. 1+70
INV. EL. = 6911.0
6910.5
20%
GRADE NEW ROADWAY
SEE DETAIL 7/C5
SEE DETAIL 11/C5
STAFF GAUGE
SEE DETAIL 8/C5
8" PVC SEWER PIPE @ 0.0% ON CONC. CRADLE
INV. EL. = 6911.0
SEE DETAIL 10/C5
SEE PLAN - SHEET C6
WEIR BOX
INV. EL. 6903.0
NEW 18" CMP x 24' LONG
INV. EL. 6900.5
8/C4
295'
SEE DETAIL 9/C5
145'
A/C4
STA. 0+96
RIPRAP AREA 12' x 15' - FORM CHANNEL TO CMP
NEW SEWAGE LAGOON
BOTTOM OF LAGOON EL. 6910.5
TOP OF WATER EL. 6914.5
5'R (TYP.)
2:1 SLOPE TYP.
315'
STA. 0+22
STA. 0+10
STA. 0+00
STA. 0-10
EL. 6917 (TYP.)
BASE LINE
2:1 SLOPE TYP.
N
LEGEND
EXISTING FEATURES
6914 EXISTING CONTOURS
6915 NEW CONTOURS
GRADING PLAN
SCALE: 1" = 20'
CONTOUR INTERVAL = 1'
THE ZIA CO. FACILITIES ENGINEERING DEPT.
FIGURE 4-3.
LOS ALAMOS NATIONAL LABORATORY
TA-53 SURFACE IMPOUNDMENTS
GRADING PLAN FOR SOUTH IMPOUNDMENT
DRAWN A VIGIL
DESIGN A. Vigil
CHECKED
RELEASED
DATE
REQUESTING DIVISION
REQUESTING GROUP
SUBMITTED
RECOMMENDED
APPROVED
UNITED STATES
Department of Energy
LOS ALAMOS AREA OFFICE - LOS ALAMOS, NEW MEXICO
AE CONTRACT NO DE-
C2
3 OF 11
CLASSIFICATION
REVIEWER
DATE
LAB JOB NO.
LAB DWG NO. ENG-C 44772
DOE DWG NO. LA-RDT-AE-C2.0
ZT-5217
4276-F



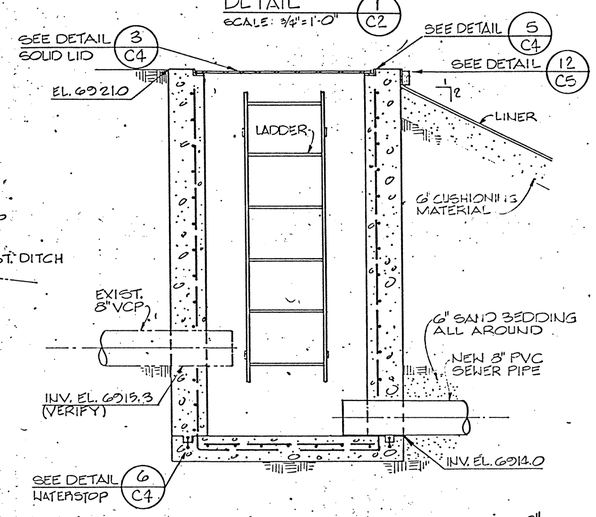
SECTION @ INLET (A / C2)
SCALE: 1" = 1'-0"



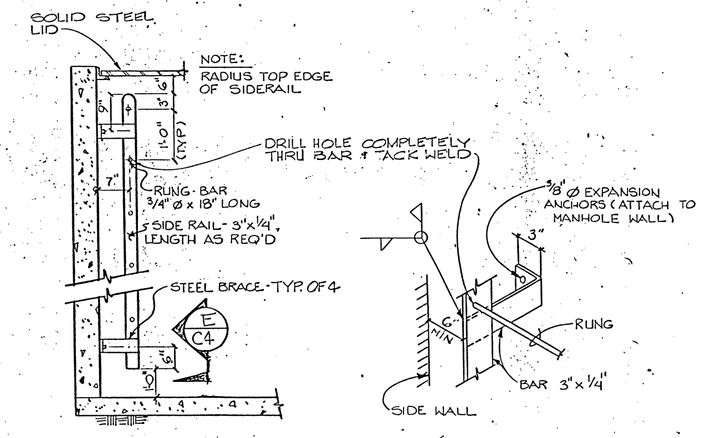
SECTION @ OVERFLOW OUTLET (B / C2)
SCALE: 1" = 1'-0"



DETAIL (1 / C2)
SCALE: 3/4" = 1'-0"

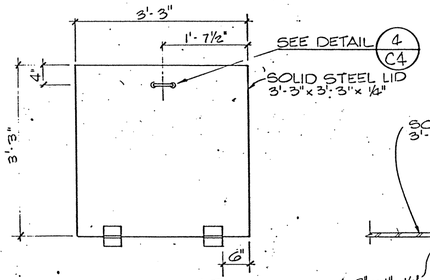


SECTION (D / C4)
SCALE: 3/4" = 1'-0"

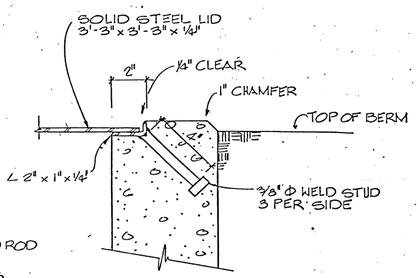


LADDER INSTALLATION DETAIL (2 / C4)
NOT TO SCALE

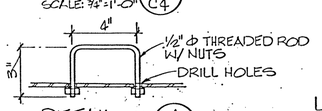
SECTION - STEEL BRACE (E / C4)
NOT TO SCALE



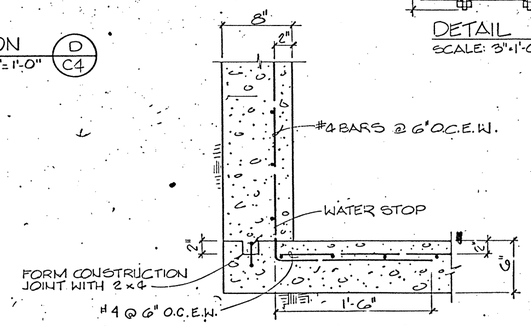
DETAIL (3 / C4)
SCALE: 3/4" = 1'-0"



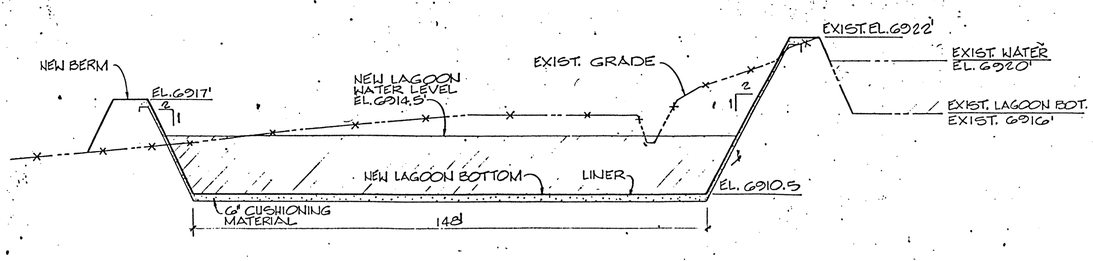
LID SEAT DETAIL (5 / C4)
SCALE: 3" = 1'-0"



DETAIL (4 / C4)
SCALE: 3" = 1'-0"



WATERSTOP DETAIL (6 / C4)
SCALE: 1½" = 1'-0"



CROSS SECTION (C / C2)
SCALE: VERT. 1" = 5'
HORIZ. 1" = 20'

NO	DATE	CLASS REV.	REVISIONS	DWN	DES	CHK	AE	ENG D.O.	DOE PM

THE ZIA CO. FACILITIES ENGINEERING DEPT.

FIGURE 4-4.
LOS ALAMOS NATIONAL LABORATORY
TA-53 SURFACE IMPOUNDMENTS
CROSS SECTION AND DETAILS
FOR SOUTH IMPOUNDMENT

DRAWN	A. VIGIL
DESIGN	A. Vigil
CHECKED	G. TALLEMASON
RELEASED	
DATE	
REQUESTING DIVISION	
REQUESTING GROUP	

SUBMITTED AE | RECOMMENDED LAB | APPROVED DOE

UNITED STATES
Department of Energy
LOS ALAMOS AREA OFFICE - LOS ALAMOS, NEW MEXICO

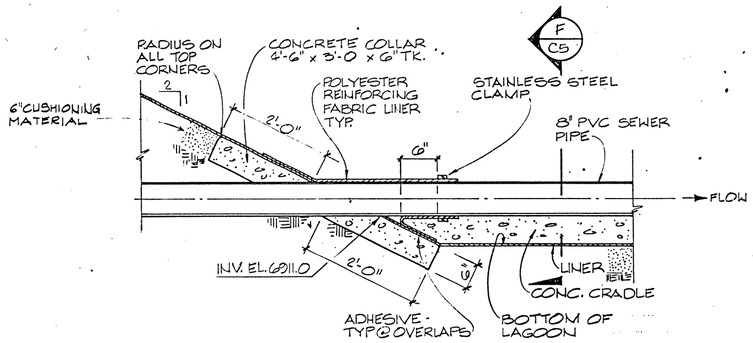
AE CONTRACT NO DE- | C4 | 5 OF 11

CLASSIFICATION | REVIEWER | DATE

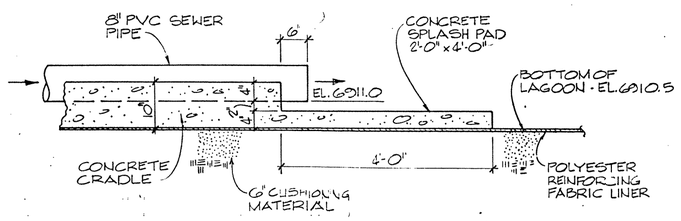
LAB JOB NO. | LAB DWG NO. ENG-C 44772 | DOE DWG NO. LA-RDT-AE-C4.C

ZT-5217

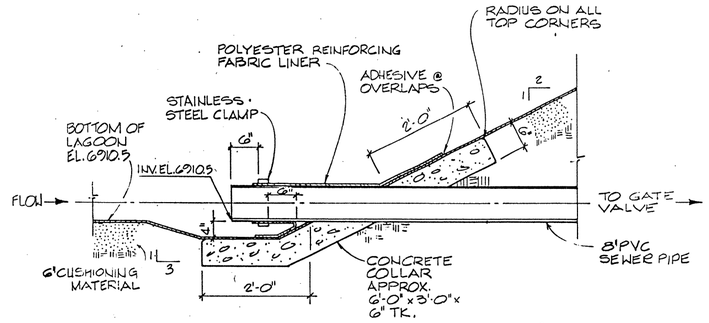
4276-K



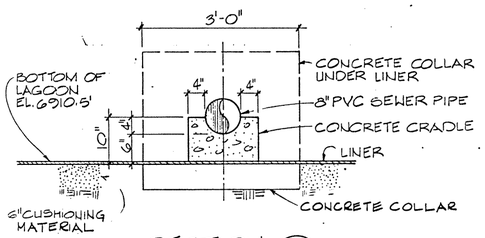
INLET DETAIL (7 / C2)
SCALE: 3/4" = 1'-0"



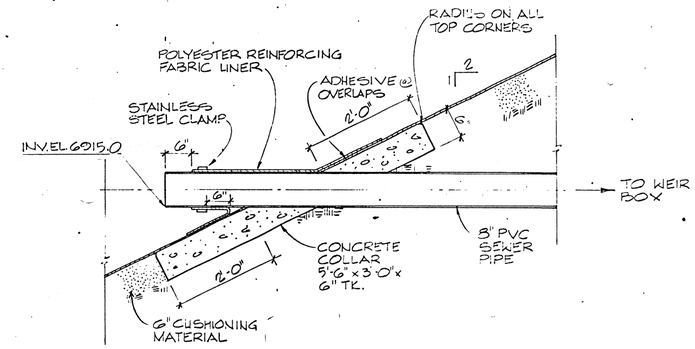
SPLASH PAD DETAIL (8 / C2)
SCALE: 3/4" = 1'-0"



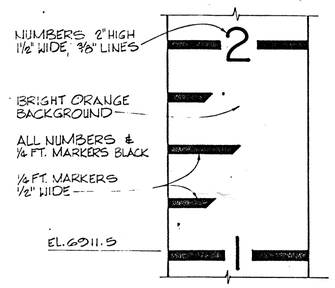
DRAIN OUTLET DETAIL (9 / C2)
SCALE: 3/4" = 1'-0"



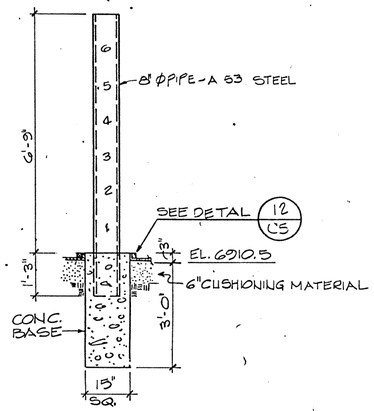
SECTION (F / C5)
SCALE: 3/4" = 1'-0"



OVERFLOW OUTLET DETAIL (10 / C2)
SCALE: 3/4" = 1'-0"

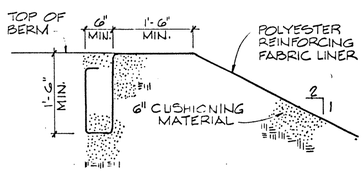


MARKING
SCALE: 3" = 1'-0"

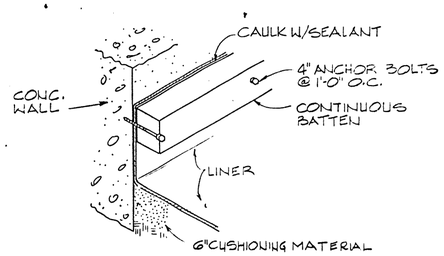


ELEVATION
SCALE: 1/2" = 1'-0"

STAFF GAUGE DETAIL (11 / C2)



LINER ANCHOR TRENCH
SCALE: 3/4" = 1'-0"



CONCRETE ATTACHMENT DETAIL (12 / C2) (12 / C4) (12 / C5)
NOT TO SCALE

NO	DATE	CLASS REV.	REVISIONS	DWN	DES	CHK	AI	ENG DD	DEP PM

THE ZIA CO. FACILITIES ENGINEERING DEPT.

DRAWN AVP
DESIGN T. Vigil
CHECKED
RELEASED
DATE
REQUESTING DIVISION
REQUESTING GROUP

FIGURE 4-5.
LOS ALAMOS NATIONAL LABORATORY
TA-53 SURFACE IMPOUNDMENTS
DRAINAGE STRUCTURAL DETAILS

SUBMITTED AE | RECOMMENDED LAB | APPROVED DOL

UNITED STATES
Department of Energy
LOS ALAMOS AREA OFFICE - LOS ALAMOS, NEW MEXICO

AE CONTRACT NO DE- | C5 | OF

CLASSIFICATION | REVIEWER | DATE

LAB JOB NO. | LAB DWG NO. ENG-C 44772 | DOE DWG NO. LA-RDT-AE

REC'D ..... TO VAULT

CT-5217

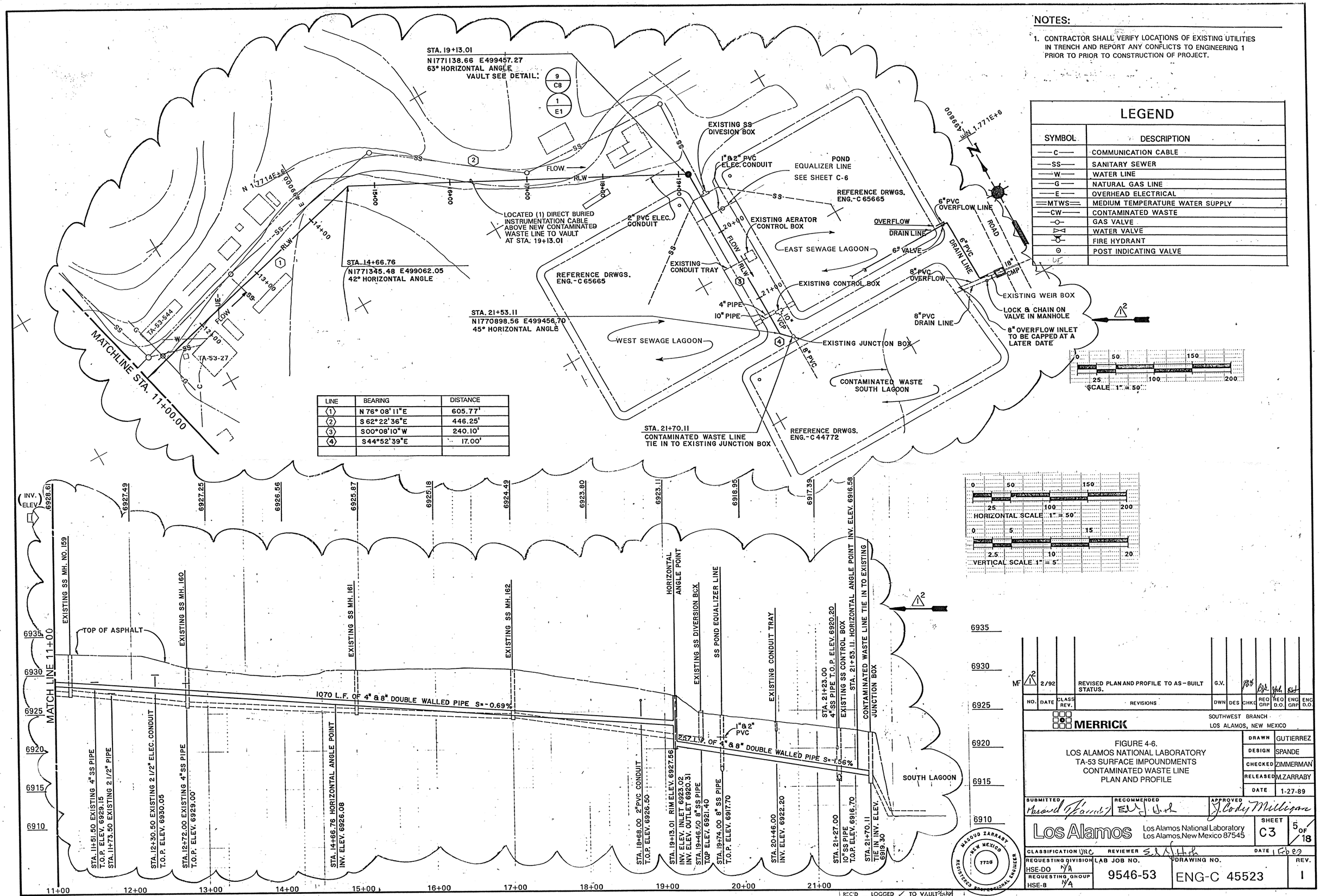
4276-H

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATIONS OF EXISTING UTILITIES IN TRENCH AND REPORT ANY CONFLICTS TO ENGINEERING 1 PRIOR TO PRIOR TO CONSTRUCTION OF PROJECT.

LEGEND

SYMBOL	DESCRIPTION
—C—	COMMUNICATION CABLE
—SS—	SANITARY SEWER
—W—	WATER LINE
—G—	NATURAL GAS LINE
—E—	OVERHEAD ELECTRICAL
MTWS	MEDIUM TEMPERATURE WATER SUPPLY
—CW—	CONTAMINATED WASTE
	GAS VALVE
	WATER VALVE
	FIRE HYDRANT
	POST INDICATING VALVE



LINE	BEARING	DISTANCE
1	N 76° 08' 11"E	605.77'
2	S 62° 22' 36"E	446.25'
3	S00°08'10"W	240.10'
4	S44°52'39"E	17.00'

NO.	DATE	CLASS REV.	REVISIONS	DWN	DES	CHKD	REQ GRP	REQ D.O.	ENG GRP	ENG D.O.
2	2/92		REVISED PLAN AND PROFILE TO AS-BUILT STATUS.	G.V.						

MERRICK

SOUTHWEST BRANCH
LOS ALAMOS, NEW MEXICO

FIGURE 4-6.
LOS ALAMOS NATIONAL LABORATORY
TA-53 SURFACE IMPOUNDMENTS
CONTAMINATED WASTE LINE
PLAN AND PROFILE

DRAWN	GUTIERREZ
DESIGN	SPANDE
CHECKED	ZIMMERMAN
RELEASED	M.ZARRABY
DATE	1-27-89

SUBMITTED: Masood Zarraby
RECOMMENDED: E.L. Hoth
APPROVED: J. Cody Millican

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

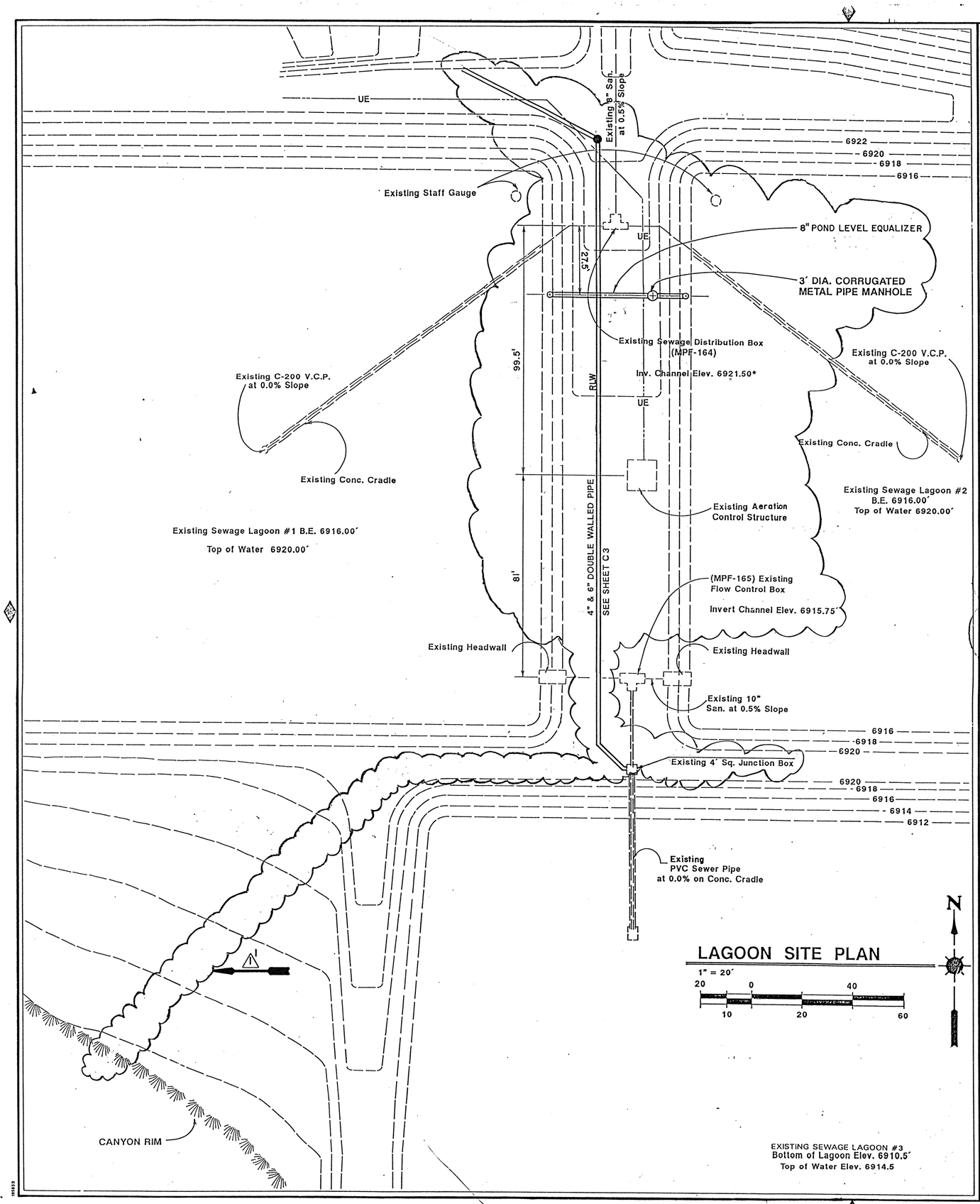
SHEET C3 — 5 OF 18

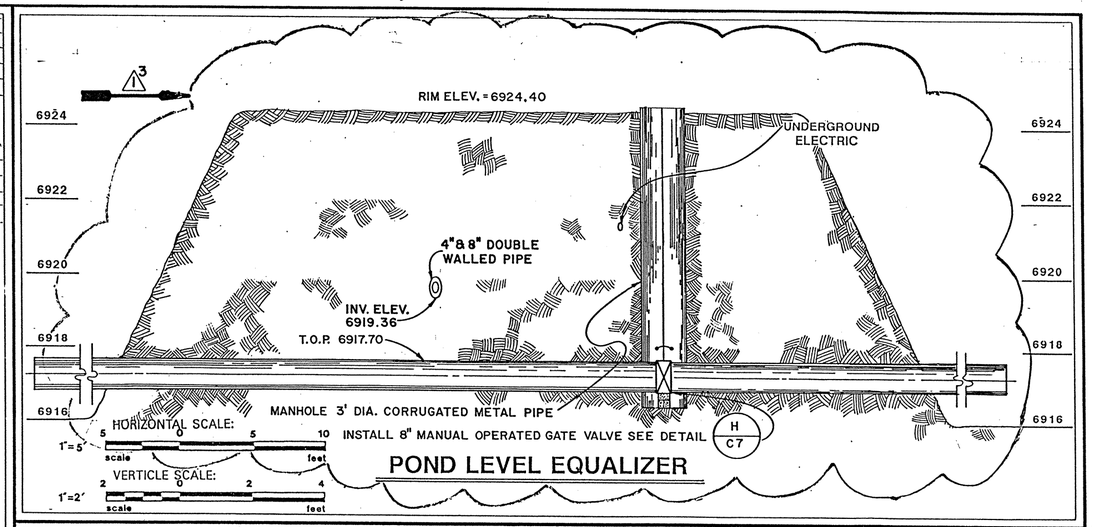
CLASSIFICATION UNC — REVIEWER E.L. Hoth — DATE 1 Feb 89

REQUESTING DIVISION HSE-DO N/A — REQUESTING GROUP HSE-8 N/A — LAB JOB NO. 9546-53 — DRAWING NO. ENG-C 45523 — REV. 1

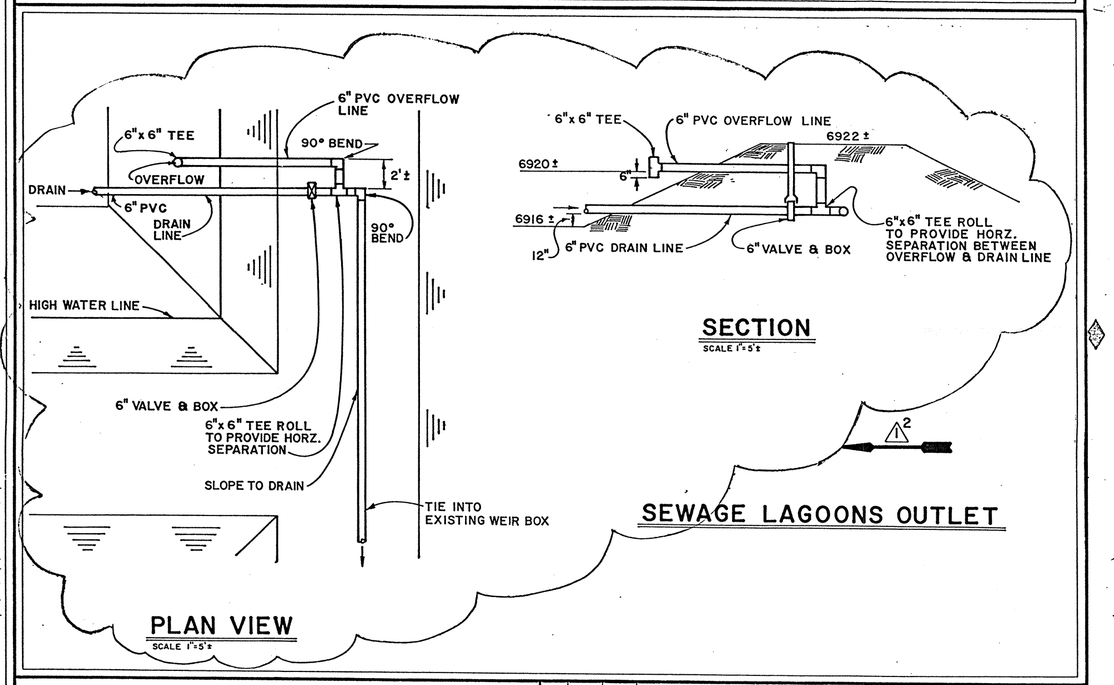
REC'D ____ LOGGED ✓ TO VAULT ✓

4276-I





POND LEVEL EQUALIZER



SECTION

SCALE 1"=5'±

SEWAGE LAGOONS OUTLET

PLAN VIEW

SCALE 1"=5'±

NOTE:
CONTRACTOR SHALL VERIFY LOCATIONS OF EXISTING UTILITIES IN TRENCHES AND REPORT ANY CONFLICTS TO ENG. 1 PRIOR TO CONSTRUCTION OF PROJECT.

NO.	DATE	CLASS REV.	REVISIONS	DWN	DES	CHKD	REQ GRP	REQ D.O.	ENG GRP	ENG D.O.
3	2/92	MF	REVISED LAGOON SITE PLAN. REVISED POND LEVEL EQUALIZER ADDED PLAN VIEW AND SECTION. DELETED WEST SANITARY SEWER OUTFLOW TO AS-BUILT STATUS.	G.V.						

MERRICK
SOUTHWEST BRANCH
LOS ALAMOS, NEW MEXICO

FIGURE 4-7.
LOS ALAMOS NATIONAL LABORATORY
TA-53 SURFACE IMPOUNDMENTS
N.E. IMPOUNDMENT OUTFALL LINE
AND POND LEVEL EQUALIZER

DRAWN	PENNEY
DESIGN	SPANDE
CHECKED	ZIMMERMAN
RELEASED	M.ZARRABY
DATE	1-27-89

SUBMITTED Marcel Zarraby
RECOMMENDED
APPROVED J. Robert Mulligan

MASOUD ZARRABY NEW MEXICO 7720 REGISTERED PROFESSIONAL ENGINEER

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

SHEET C6 8 OF 18

CLASSIFICATION U/U REVIEWER DATE 1 Feb 89

REQUESTING DIVISION	LAB JOB NO.	DRAWING NO.	REV.
HSE-DO N/A	9546-53	ENG-C45523	1
REQUESTING GROUP HSE-8 N/A			

4276-J

The impoundment berms serve as man-made barriers for flood control and drainage as shown on Figures 4-1 and 4-3. In addition, natural drainage around the surface impoundments transports surface runoff away from the impoundments.

4.3.2 Erosion Controls

The mechanism for causing erosion of the dike slope is direct rainfall on the dikes. The site is located in a semiarid region. The average annual rainfall in the region is less than 18 inches, most of which comes during the months of April through October. The slopes were seeded to encourage vegetation growth; therefore, erosion of the dike material is not expected to be significant.

4.4 EXISTING MONITORING SYSTEMS

There are existing monitoring systems in place at the site. See Section 5.0, Ground-Water Monitoring Program, for information regarding monitoring systems installed at the site.

4.5 CERTIFICATION

As previously mentioned, a stability analysis will be completed as part of the proposed geotechnical evaluation. ~~within 6 months~~. An engineer's certification attesting to the as-built design stability of the impoundment dikes will be made after the geotechnical investigation, described in Section 4.1.2.1, is performed.

6.0 PROCEDURES TO PREVENT HAZARDS

The information provided in this section is submitted in accordance with the requirements of 40 CFR Part 270.14. The following subject areas are addressed in this section: security, inspection schedules and requirements, and preparedness and prevention requirements.

6.1 SECURITY

Security at the TA-53 surface impoundments is accomplished with both artificial and natural barriers. These barriers satisfy the requirements of 40 CFR 264.14(b)(2). The access road to the impoundments is blocked by a locked gate, and fences extend outward from this gate to the edge of the mesa (Figure 6-1). Another access control fence surrounds the perimeter of the surface impoundments. This fence has a gate for vehicular access on the north side, between the two north impoundments, and a pedestrian access gate on the east side. In addition to ~~this~~ these artificial barriers, cliffs surrounding the surface impoundments serve as natural barriers to discourage unauthorized entry. Bilingual warning signs have been posted on the fence around the outside perimeter of the impoundments (see Figure 6-1). ~~LANL is currently in the process of installing a fence around the entire technical area.~~

6.2 INSPECTION SCHEDULES AND REQUIREMENTS

The inspection schedule for the TA-53 surface impoundments has been developed to identify situations that might lead to a release and pose a threat to human health and the environment. The following areas are addressed for the TA-53 surface impoundments according to requirements specified in 40 CFR Part 264.15(b) and 40 CFR Part 264.226(b). While the surface impoundments are in operation, they must be inspected weekly and after storms for deterioration,

malfunctions, or improper operation of overtopping controls; sudden drops in the level of the impoundment liquid; and severe erosion or other signs of deterioration in the dikes. Specifically, the surface impoundments, dikes, and vegetation surrounding the dikes will be inspected visually on the first working day of each week and after storms. ~~for the following items:~~ The following items on LANL's Inspection Record Form will be addressed:

- Surface impoundment level, containment, and pipe connections
- Run on/off control
- Warning signs - bilingual signs must be posted and readable
- Security - fences, locks, gates, alarms
- Site lighting
- Communication equipment - present and in good working order
- Radiation safety - radiation screening for gross alpha, beta, gamma, and tritium is an inspection requirement directed by LANL policy.

Inspection frequencies may be increased at the discretion of the operating group or the Environmental Protection Group (EM-8, formerly HSE-8).

6.3 INSPECTION RECORDS

~~Inspections are conducted by assigned personnel from the operating group that manages the surface impoundments.~~ Inspections are being conducted by Johnson Controls Inc. (JCI) personnel, with oversight and management by Engineering (ENG)-8 and inspection training and guidance from EM-8. A logbook retaining originals of the inspection records is ~~will be~~ maintained by JCI ~~the responsible group~~ for a minimum of three years from the date of inspection. Copies of inspection records are ~~must be~~ sent to EM-8 ~~2~~ at the end of each work week. EM-8 ~~2~~ will

maintain a copy of the inspection records for a minimum of three years from the time the copy is received. The inspection records must be available in the event that the NMED, the U.S. EPA, or the DOE inspects the facility for compliance with inspection requirements.

An example of the Inspection Record Form (IRF) used at LANL is provided as Figure 6-2. The form may be modified, or an equivalent form developed by EM-8 2, if necessary. The IRF is a comprehensive form which applies to all categories of both hazardous and mixed waste units; thus, not all sections of the IRF apply to all units. The form encompasses 40 CFR Part 264 requirements for permitted hazardous waste units, 40 CFR Part 265 interim status requirements, and additional requirements directed by LANL policy. All 40 CFR Part 264 inspection requirements will be addressed at the surface impoundments during each weekly inspection. The IRF must be completed on the first working day of each week for the surface impoundments. In the event that the primary inspector is not available to complete the IRF, an alternate will be responsible for its completion.

For every item requiring inspection (shown in Section 6.2 1), a response must be entered in the "Condition" column. The two responses are "OK" and "AR" (action required). Either "OK" or "AR" must be entered for each inspected item. If the response is "AR", the action required must be noted in Part II of the IRF. If more than one "AR" is listed, "ARs" should be numbered. The date any corrective action is taken and a description of the action taken must be entered in the "Action/Date" column on the IRF. Only after corrective action has been completed and recorded on an IRF can an "OK" be entered in the "Condition" column on the IRF.

6.4 REMEDIAL ACTIONS

If any defects, deterioration, damage, or potential hazards at the surface impoundments are discovered during inspection, appropriate remedial action will be completed promptly to minimize further damage and prevent the need for emergency response. Any preventative action taken in response to an inspection will be noted on the IRF.

If a condition is found in which a release is imminent or has already occurred, the condition will be assessed by the group leader (or his designee) responsible for the surface impoundments. If this assessment indicates that human health and the environment may be adversely affected, the Contingency Plan for Mixed Waste Units (see Section 7.0 and Appendix H) will be implemented immediately. Section 7.0 and Appendix H discuss~~es~~ the appropriate emergency measures that will be followed in the event of an actual release. ~~Whenever possible, Section 7.0 refers to equivalent sections in Appendix D of the permit.~~ In the event the Contingency Plan is needed, any sampling, decontamination, and verification will be conducted as specified in the plan. If the surface impoundments must be removed from service or emptied, requirements in Section 15.0 Appendix H ~~Section 7.5.1~~ and procedures in Section 9.2.2.1 of this document will be met and followed.

6.5 PREPAREDNESS AND PREVENTION REQUIREMENTS

The communication, alarm, and emergency equipment available at LANL to provide emergency instructions for evacuation or initiate an emergency response is discussed in Appendix H of this application ~~Appendix D of the permit issued to LANL~~. Communication equipment is Laboratory-wide and allows personnel to contact emergency coordinators in all areas of the Laboratory. The vehicles used by JCI personnel while performing inspections at the TA-53 surface impoundments

are equipped with two-way radios. Pumper trucks used by EM-7 personnel while transporting radioactive liquid waste from Tank MPF-1 are also equipped with communication radios. Immediate access to the two-way radios allows these personnel to quickly summon emergency assistance. Emergency equipment, including spill control and decontamination equipment, available for use at TA-53 is presented in Appendix H ~~Section 7.2.2~~ of this document (pages 1 and 34-36 of Appendix C in the Contingency Plan). All communication, spill control, and decontamination equipment is tested and maintained, as necessary, to assure its proper operation in time of emergency.

The surface impoundments at TA-53 manage compatible liquid waste. No known compounds are present in the impoundments at levels that could exhibit the characteristics of ignitability or reactivity. The likelihood of a fire or explosion resulting from a reaction of ignitable, reactive, or incompatible wastes, therefore, does not exist at these waste management units. Hence, portable fire extinguishers and special fire control equipment are not provided at the impoundments.

6.6 PREVENTATIVE PROCEDURES AND EQUIPMENT

~~Precautions will be taken to prevent hazards which may occur during unloading operations of transported sanitary waste and to prevent releases to the atmosphere.~~ During the period when sanitary waste was transported to the TA-53 surface impoundments from other technical areas, precautions were taken to prevent hazards which may occur during unloading operations. In addition, the impoundment dikes are designed to prevent runoff from waste handling areas to other areas of the facility or to the environment. A LANL policy directive was issued, effective July 12, 1991, which discontinued the practice of transporting sanitary waste from other technical

areas to the TA-53 surface impoundments. Preventative procedures for unloading operations are still practiced for waste which is transported within TA-53.

Based on available analytical data, the liquids in the impoundments do not contain volatile organic compounds listed as hazardous constituents. In addition, administrative controls prevent the entrance of volatiles in the liquid waste influent to the impoundments. There may be low concentrations of organic compounds in the sludge. It is believed that the sludge will entrain the volatile organic compounds, reducing the likelihood of significant concentrations being present in the liquid. Their historical absence in the impoundment fluid supports this assumption. If volatile organic compounds are present in the sludge but absent in the liquid, the likelihood of significant exposure or releases to the atmosphere as a result of aeration is small.

Minimum requirements for safety clothing and apparatus to be used for routine operations are specified in the facilities' "Utilities Operating Instructions for Wastewater Operations" (JCI, 1991). Maintenance work may only be performed in the presence of a LANL HS-1 monitor and only with appropriate personal protective equipment.

The only electrically powered equipment at the TA-53 surface impoundments are the ~~evaporators~~ aerators, so an electrical power failure would not affect the operations at the impoundments. The four ~~evaporators~~ aerators and the mechanical flow meter are the only pieces of equipment at the surface impoundments that may be ~~are~~ subject to failure. Should the flow meter fail, replacement meters are available at the JCI mechanical utilities shop. Failure of a flow meter or an aerator is not considered an emergency.

The sanitary sewer collection line which enters the northwest impoundment does not have a shut-off valve at the impoundment. If influent to the northwest impoundment must be halted in order to prevent an emergency situation at the impoundments, the water source will be turned off at the TA-53 water tank (TA-53-55). In such an event, water for fire protection will be brought in with LAFD pumper trucks and tankers. There are two connections between the two north surface impoundments. One consists of a weir box and a movable plate, which may be inserted manually. The second consists of a pond equalizer with a manually operated gate valve. The weir plate and the gate valve may be manually moved or closed to segregate the two north impoundments in the event of an emergency.

The connection between the north and south impoundments also consisted of a weir box. To prevent liquids from entering the south impoundment from the north impoundments, a portion of the weir box was filled with concrete in early 1992. Currently, if liquids are needed in the south impoundment (e.g., to weigh down the liner), clean water is added. Prior to 1992, a weir plate was manually placed into the weir box to keep liquids from entering the south impoundment from the north impoundments.

Radioactive liquid waste is stored in Tanks MPF-1 and Tanks 68, 69, 144, and 145 at TA-53. Before the contents of these tanks are pumped and discharged via the radioactive liquid waste line or hauled to the south impoundment, they are analyzed for radioactivity. Contaminated liquid waste is discharged through the radioactive liquid waste line only occasionally; it is not a continuously-flowing system. Therefore, in the event of an emergency at the south impoundment, influent of radioactive liquid waste may be stored in the tanks until the emergency situation has been mitigated.

TA-53

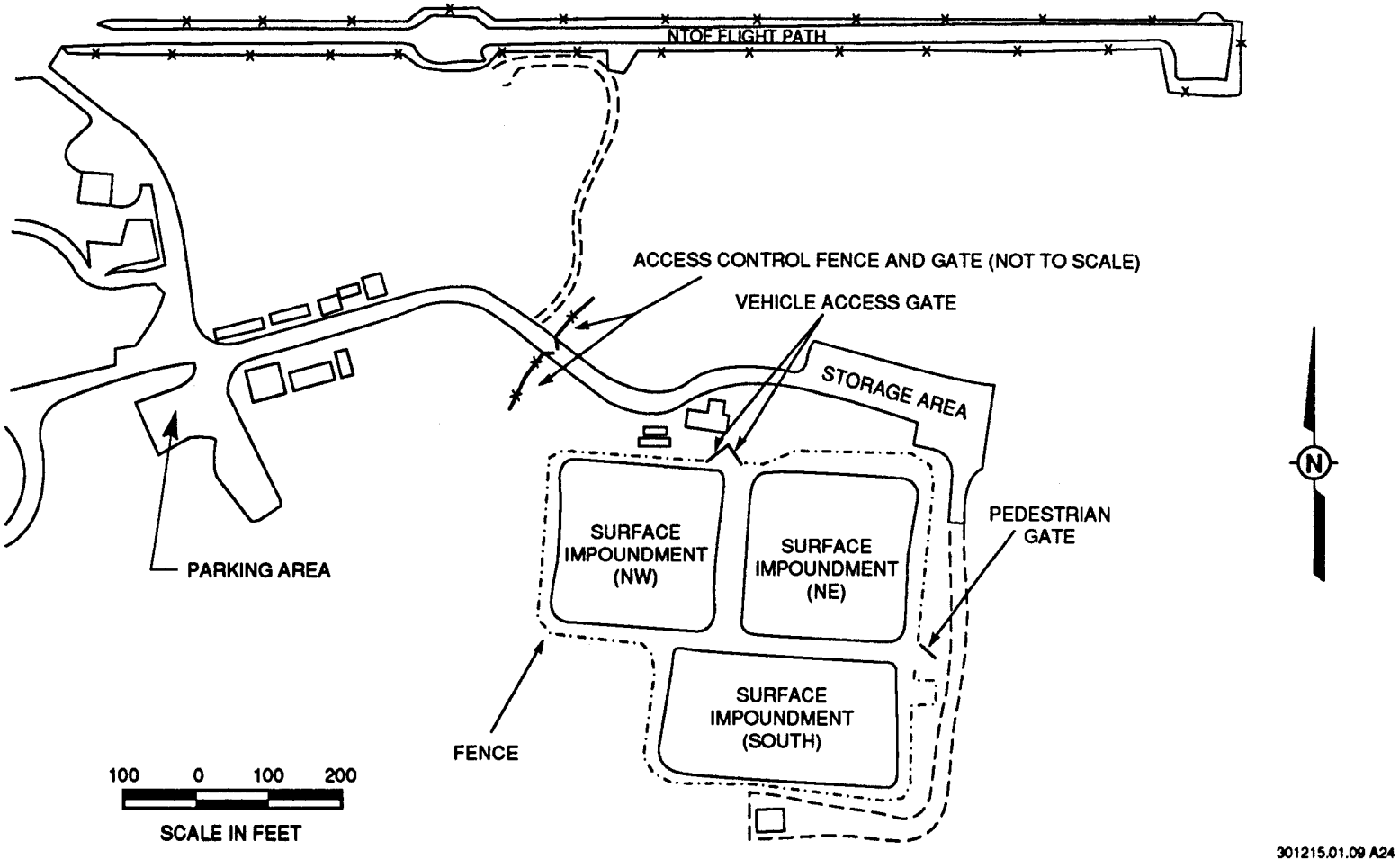


Figure 6-1. Location map of the access control fence and gate and the perimeter fence and gates at the TA-53 surface impoundments.

HAZARDOUS AND MIXED WASTE FACILITY INSPECTION RECORD FORM

[1] FACILITY	[2] ☐ <90 DAY, GENERATOR STORAGE ☐ TREATMENT, STORAGE, DISPOSAL	[3] START DATE	[4] END DATE

[5] ☐ Containers ☐ Landfill ☐ Surface Impoundment ☐ Waste Pile ☐ Thermal Treatment ☐ Chem/Phys/Bio. Treat.

☐ Incinerator ☐ Misc. Unit ☐ Tank ☐ UST ☐ Land Treatment ☐ Underground Inj.

PART I - Enter condition of item inspected (OK or AR*) in column for day inspected.

ITEM	INSPECTED FOR	SUN	MON	TUE	WED	THU	FRI	SAT
[6] NO USE	CHECK IF NO WASTE IS PRESENT							
[7] (UN)LOADING AREA TANKS/CONTAINERS	SPILLS AND DETERIORATION							
[8] COMMUNICATION EQUIPMENT (PHONE/RADIO/ALARMS)	PROPERLY FUNCTIONING							
[9] TANKS (ALL ABOVE GROUND PORTIONS) MONITORING DATA	DISCHARGE CONTROLS CONDITION, LEAKS, LEVEL (6" FREEBOARD), CORROSION							
[10] SURFACE IMPOUNDMENTS AND CONTAINMENT	FREEBOARD (2 ft) SUDDEN DROPS IN LEVEL							
[11] PORTA BERM	LEAKS CONDITION							
[12] EYE WASH SAFETY SHOWERS	LEAKS, FUNCTIONING							
[13] STRUCTURAL INTEGRITY OF CONTAINERS/TANKS, VALVES, PIPES, AND FLANGES	DETERIORATION AND LEAKS, CORROSION, DAMAGE							
[14] COVER/LID OF CONTAINERS	CLOSED AND SECURED							
[15] WARNING SIGNS	POSTED & READABLE (BILINGUAL)							
[16] LABELS	"HAZARDOUS WASTE" PRESENT ON ALL CONTAINERS/TANKS							
[17] ACCUMULATION START DATE (<90 DAY STORAGE)	PRESENT ON ALL CONTAINERS, TANKS, NONE EXCEED 90 DAYS							
[18] RUN ON/OFF CONTROL (AREA L, G, H, P) LANDFILLS, DETONATION PADS	INTEGRITY, EROSION PONDING							
[19] COVER INTEGRITY (AREA L, G, H, P) LANDFILLS	EROSION, SUBSIDENCE WATER INTRUSION							
[20] SECURITY	CONDITION, FENCE/GATES/LOCKS							
[21] SITE LIGHTING	FUNCTIONS PROPERLY							

301215.01.09 A30

Figure 6-2. Hazardous and mixed waste facility Inspection Record Form.

301215.01.09 A31

ITEM	INSPECTED FOR	SUN	MON	TUE	WED	THU	FRI	SAT
22 CONTAINMENT STRUCTURES	INTEGRITY, STANDING WATER VEGETATION, EROSION							
23 MANAGEMENT OF CONTAINERS	SEGREGATED ACCORDING TO COMPATIBILITY, 2 FT AISLE SPACE							
24 HOSE BIBS, WATER SUPPLY	LEAKS, FUNCTIONING							
25 STORAGE SHED (AREA L)	FLOOR DAMAGE, LIQUID							
26 ROAD/WORK SURFACES	CRACKS/POTHOLES							
27 WIND SOCK	DAMAGE, FUNCTIONING							
28 SHAFT COVER AND RAIL	PRESENT, DAMAGE							
29 PALLETS	INTEGRITY, DAMAGE							
30 TREATMENT TANKS	PROPER OPERATION, LEAKS							
31 REFRIGERATOR	DAMAGED CONTAINERS							
32 SPILL CONTROL, FIRE, AND EMERGENCY EQUIPMENT	PRESENT, AND IN GOOD WORKING ORDER							
33 INCINERATOR EMERGENCY WASTE FEED CUTOFF/ALARMS	PROPER OPERATING CONDITION OF ALL SHUTDOWN CONTROLS							
34 INCINERATOR PUMPS VALVES, PIPES. MONITORING CONTROLS	LEAKS/SPILLS/TAMPERING OPERATING WITHIN SPECS.							
35 PRESSURE VESSELS (S-SITE)	DETERIORATION AND SAND CONDITION							
36 OIL BURN PANS (S-SITE)	DETERIORATION & LEAKS							
37 HE BURN PADS (S-SITE)	DETERIORATION VEGETATION, SAND COND., EROSION							
38 RADIATION SAFETY	SIGNS, MONITORING ($\alpha\ \beta\ \gamma\ ^3H$)							
39 DATE	DATE OF INSPECTION							
40 TIME	TIME OF INSPECTION							
41 INSPECTOR	INITIALS OF INSPECTOR							

PART II - For any AR (Action Required) in PART I above, describe below: action required, action taken, date of action. Attach additional sheets if necessary.

42 INSPECTOR	43 GROUP	44 DATE	45 TIME

Figure 6-2 (continued). Hazardous and mixed waste facility Inspection Record Form.

7.0 CONTINGENCY PLAN FOR MIXED WASTE UNITS

~~This section presents the HWF Contingency Plan for LANL. The plan is~~ The Contingency Plan for Mixed Waste Units, written in accordance with 40 CFR Part 264, Sections 32(a)-(d), 50-55 (i.e. Subpart D), and 227(a)-(d), and 40 CFR Part 270, Sections 14(b)(7) and 17(e), is included as Appendix H. The provisions of this plan will be carried out immediately whenever there is a fire, explosion, or release of mixed waste or hazardous constituents that could threaten human health or the environment.

~~Information included in this section is relevant only to the surface impoundments at TA-53. This section is intended to supplement the existing Contingency Plan in Appendix D of LANL's permit. Together, the contents of Appendix D in the existing permit and this section satisfy the requirements of 40 CFR Part 264, Subpart D, and 40 CFR Part 270.14(b)(7).~~

~~Subsections in this section are organized in the same manner as in the existing permit. Reference to the permit is made whenever there is no change to the permit text.~~

7.1 INTRODUCTION

See Section 1.0 in Appendix H. ~~D.1 in the permit.~~

7.1.1 Mixed ~~Hazardous~~ Wastes

See Section 1.2 of Appendix H. ~~D.1.1 in the permit.~~

7.1.2 Mixed ~~Hazardous~~ Waste Units

See Section 1.2 of Appendix H. ~~D.1.2 in the permit.~~

The waste units addressed in this application ~~section~~ are the three surface impoundments in TA-53 (Figures 2-2 and 2-3). The impoundments store liquid waste and sludge. The sludge at the bottoms of these impoundments may contain metals, organic compounds, and low-level radionuclides.

7.2 MIXED ~~HAZARDOUS~~ WASTE EMERGENCY RESPONSE RESOURCES

See Section 2.0 of Appendix H. ~~D.2 in the permit.~~

7.2.1 Response Groups

See Section 2.0 of Appendix H. ~~D.2.1 in the permit.~~

7.2.1.1 Medical Facilities

See Sections 2.2.2 and 2.6.3 of Appendix H. ~~D.2.1.1 in the permit.~~

7.2.1.2 ~~HS-3 Safety and~~ Risk Management Support (HS-3) ~~Assessment~~

See Section 2.2.3 of Appendix H. ~~D.2.1.2, HSE-3 Safety, in the permit.~~

7.2.1.3 ~~HS-5~~ Industrial Safety and Hygiene (HS-5)

See Section 2.2.4 of Appendix H. ~~D.2.1.3, in the permit.~~

7.2.1.4 ~~EM-7~~ Waste Management (EM-7)

See Section 2.3.1 of Appendix H. ~~D.2.1.4, HSE-7 Waste Management, in the permit.~~

7.2.1.5 ~~EM-8~~ Environmental Protection (EM-8)

See Section 2.3.2 of Appendix H. ~~D.2.1.5, HSE-8 Environmental Surveillance, in the permit.~~

7.2.1.6 Los Alamos Fire Department

See Section 2.6.1 of Appendix H. ~~D.2.1.6 in the permit.~~

7.2.1.7 Protection Technology Los Alamos ~~Mason & Hanger Protective Force~~ (PTLA, Pro-Force)

See Section 2.5.1 of Appendix H. ~~D.2.1.7 in the permit.~~

7.2.1.8 Johnson Controls World Services Inc. (JCI)

See Section 2.5.2 of Appendix H. ~~D.2.1.8, PAWS, in the permit.~~

7.2.1.9 Los Alamos ~~County~~ Police Department

See Section 2.6.2 of Appendix H. ~~D.2.1.9 in the permit.~~

7.2.1.10 WX and M Division Personnel

See Section 2.1 of Appendix H. ~~D.2.1.10 in the permit.~~

7.2.1.11 ~~Operational Management Group I~~ Emergency Management Office

See Section 2.1 of Appendix H. ~~D.2.1.11 in the permit.~~

7.2.2 Emergency Equipment and Communications

See Section 3.0 of Appendix H. ~~D.2.2 in the permit.~~

In addition to the emergency equipment listed in Appendix C of the Contingency Plan, ~~Table 7-3 of the permit,~~ telephones are available at the JCI building at TA-53 and throughout TA-53 for internal and external communication. Communication radios are available in the trucks used by JCI personnel when performing inspections at the impoundments. In the event of an emergency at the TA-53 surface impoundments, ~~a~~ HAZMAT emergency response vehicles and trailer stationed at TA-59-1 may be transported to the site. The vehicles and trailer are ~~is~~ equipped with safety and emergency equipment, personal protective clothing, and other supplies which include, but are not limited to: assorted coveralls and gloves, safety goggles and glasses, booties, totally encapsulating suits and boots, self-contained breathing apparatus (SCBA), and SCBA bottles, reference materials, shovels, assorted spill kits and sorbents, communication radios, leak repair kits, respirators and cartridges, sponges and cleaners, warning signs, traffic control barriers, flashlights, warning horns, portable emergency oxygen, and assorted tools and supplies.

~~7.2.3 Communications~~

~~See Section D.2.3 in the permit.~~

7.3 NONSUDDEN RELEASES

See Section 8.0 of Appendix H.

Nonsudden releases include those incidents which, if uncontrolled, may impact the environment over a long period of time. At the TA-53 surface impoundments, such an incident may result from

minor leaks of the dikes surrounding the impoundments or breaches in the impoundment lining resulting in a release.

In the event that a leak in the outside dike surrounding the three impoundments is detected, the impoundment(s) nearest the leak will be removed from service until repairs can be made.

7.3.1 Responsibility

See Section 8.1 of Appendix H. ~~D.3.1 in the permit.~~

7.3.2 ~~Credible~~ Nonsudden Releases

See Section 8.2 of Appendix H. ~~D.3.2 in the permit.~~

Minor leaks in the dikes surrounding the TA-53 surface impoundments may result in credible nonsudden releases. Detection of nonsudden releases will be accomplished by visual inspection of the dikes for leaks. If leaks are detected, maintenance of the surrounding dikes will be performed.

7.3.3 Nonsudden Release Surveillance

See Section 8.3 of Appendix H. ~~D.3.3 in the permit.~~

7.4 SUDDEN RELEASES

See Sections 5.0, 6.0, and 7.0 of Appendix H. ~~D.4 in the permit.~~

7.4.1 Mixed ~~Hazardous~~ Waste Emergency Coordination

See Section 2.1 of Appendix H. ~~D.4.1 in the permit.~~

7.4.2 ~~HWF Emergency~~ Contingency Plan Implementation

See Section 4.0 of Appendix H. ~~D.4.2 in the permit.~~

7.4.2.1 Guidelines for Implementation

See Section 4.1 of Appendix H. ~~D.4.2.1 in the permit.~~

7.4.2.2 Emergency Notification

See Section 4.2 of Appendix H. ~~D.4.2.2 in the permit.~~

7.4.2.3 Emergency Manager ~~Management Coordinator (EMC)~~ Actions

See Section 4.3 of Appendix H. ~~D.4.2.3, EPODO Actions, in the permit.~~

7.5 SPECIFIC EMERGENCY RESPONSE PROCEDURES FOR MIXED ~~HAZARDOUS~~ WASTE UNITS

Sections 5.0, 6.0, and 7.0 ~~7.5.1 through 7.6.2~~ summarize or reference the guidelines for handling emergencies.

7.5.1 ~~Chemical~~ Spills

See Section 5.0 of Appendix H. ~~D.5.1 in the permit.~~

If the structural integrity of the TA-53 surface impoundments is breached, a sudden drop in the level of liquids may result. Should failure occur in the dikes surrounding an impoundment, the surface impoundment will be removed from service and the flow of influent will be stopped immediately. Temporary dikes will be constructed to contain any surface spills. Emergency measures will be implemented to stop a leak and prevent catastrophic failure of the surface impoundment dikes. The impoundments will be emptied if a dike failure cannot be controlled. The NMED will be notified verbally and in writing of any problems involving dike failure or sudden drops in the levels of surface impoundment liquids within seven days after detection.

If a surface impoundment is removed from service, it will not be restored to service until the failure has been repaired. The structural integrity of the dike will be recertified in accordance with 40 CFR Part 264.226(c) whenever imminent or actual dike failure occurs. Should a sudden drop in the liquid level of a surface impoundment occur and result in the impoundment's removal from service, the repaired liner will be certified by a qualified engineer and meet approved design specifications.

7.5.1.1 Spill Control Procedures

See Section 5.1 of Appendix H. ~~D.5.1.1 in the permit.~~

7.5.2 Fire

See Section 7.0 of Appendix H. ~~D.5.2 in the permit.~~

7.5.3 Explosion

See Section 6.0 of Appendix H. ~~D.5.3 in the permit.~~

7.5.4 Exposure to Mixed Waste or Mixed Materials

See Section 9.0 of Appendix H. ~~D.5.4 in the permit.~~

7.5.5 Flood

See Section 2.2.2 of this Part B application. ~~D.5.5 in the permit.~~

7.6 EVACUATION

See Section 10.0 of Appendix H. ~~D.6 in the permit.~~

7.6.1 Evacuation Plan

See Section 10.2 of Appendix H.

Emergency situations may warrant the shutdown and evacuation of an area(s) or building(s) in order to protect personnel and property, to anticipate the emergency condition, or to enhance the appropriate response. The evacuation route at the TA-53 surface impoundments is shown on Figure 15 in Appendix H.

~~Figure 7-1 shows the evacuation route at the TA-53 surface impoundments. See Section D.6.1 in the permit for the remainder of this subsection.~~

7.6.2 Emergency Process Shutdown Prior to Evacuation

Process shutdown procedures discussed in the permit do not apply to the TA-53 surface impoundments since they are used solely for storage. However, if the impoundment dikes threaten failure or have failed, influent to the surface impoundments will be discontinued.

7.7 SALVAGE AND CLEANUP

See Section 11.0 of Appendix H. ~~D.7 in the permit.~~

7.8 POST-EMERGENCY ASSESSMENT

See Section 12.0 of Appendix H. ~~D.8 in the permit.~~

7.9 EMERGENCY RESPONSE RECORDS

See Section 13.0 of Appendix H. ~~D.9 in the permit.~~

7.10 EMERGENCY REPORTS

See Section 13.0 of Appendix H. ~~D.10 in the permit.~~

7.11 CONTINGENCY PLAN AMENDMENT

See Section 14.0 of Appendix H. ~~D.11 in the permit.~~

8.0 PERSONNEL TRAINING

~~The personnel training program for LANL has not changed from that given in Attachment C of the Hazardous Waste Facility Permit issued to LANL in November 1989 (Permit Number 0890010515-1).~~

The Personnel Training Plan for Mixed Waste Units is included as Appendix I. The plan is written in accordance with 40 CFR 264.16 and 265.16, Personnel Training. An outline of both the introductory and continuing training programs at LANL is given in Attachment I of the plan in Appendix I.

8.1 Personnel Training Requirements for TA-53 Surface Impoundments

Sanitary sewer operators from JCI are responsible for inspections of the TA-53 surface impoundments. These operators are under supervision by the JCI utilities supervisor. Oversight and management of JCI personnel are provided by a staff engineer from ENG-8. Overall responsibility for the impoundments resides with ENG-8.

The responsible JCI personnel are given classroom training in hazardous waste operations, hazard communications, and radiation protection. Instruction on inspection procedures and emergency procedures is given as on-the-job training by EM-8 and the JCI utilities supervisor. This training enables the sanitary sewer operators to use and inspect emergency equipment at the TA-53 surface impoundments. If repair and/or replacement of emergency equipment is required, a request for such is made through the JCI utilities supervisor. Training in site-specific

emergency procedures ensures that JCI personnel are familiar with communications and alarm systems and that they are able to respond to emergency situations. The sanitary sewer operators and the JCI utilities supervisor use JCI utilities operating procedures for stopping the flow of influent to the surface impoundments if shutdown of operations is required.

Facility operation technicians from EM-7 are responsible for pumping liquid waste from tank MPF-1 in Building 1 at TA-53, hauling the waste to the south impoundment, and discharging the waste to that impoundment. These personnel have received instruction in hazardous and mixed waste operations, radiation protection, radiation worker training, respiratory protection, spill response, and emergency procedures. They also receive training in the standard operating procedures developed by EM-7 that are applicable to pumping and transporting the liquid waste. In addition, these technicians receive on-the-job training from experienced operators who are familiar with the standard operating procedures.

9.0 CLOSURE AND POST-CLOSURE PLAN

9.1 INTRODUCTION

This section is prepared in accordance with 40 CFR Part 264, Subpart G, Closure and Post-Closure. The plan identifies all steps that will be necessary to close the TA-53 surface impoundments at the end of their operating period.

LANL intends to close the TA-53 surface impoundments in accordance with clean closure requirements. To meet these requirements, LANL proposes to remove liquids and sludge from the impoundments, decontaminate the liner materials, and remove underlying and surrounding contaminated soil, if any, to levels acceptable to the NMED.

9.1.1 Estimate Of Maximum Waste In Storage

The three surface impoundments provide a maximum liquid storage capacity of 5,838,288 gallons. The south impoundment, predominantly used now for radioactive cooling water, has a maximum liquid storage capacity of 2,580,000 gallons. The NE and NW impoundments, used for sanitary waste treatment and storage, have a maximum liquid storage capacity of 1,629,144 gallons each. The total quantity of sludge in the bottoms of the impoundments is unknown; in the two sanitary waste impoundments, the sludge layer may be a few inches to 18" thick. There is expected to be far less sludge in the radioactive cooling water impoundment.

9.1.2 Description of Waste Handled

Mixed waste is suspected to be present in the sludge at the bottoms of the impoundments. The mixed waste may consist of organic compounds, metals, and low-level radionuclides.

9.2 CLOSURE PROCEDURES AND DECONTAMINATION

Closure plans are designed to meet the following performance standards:

- Protect human health and the environment
- Prevent the escape of hazardous waste, hazardous constituents, leachate, contaminated rainfall, or waste decomposition products to the ground or surface waters or atmosphere
- Minimize future maintenance

The procedures discussed below provide for removal of standing liquids, sludge, and other contaminated materials to meet the requirements of clean closure in accordance with these performance standards.

9.2.1 Partial Closure

Partial closure would consist of closing one or more of the surface impoundments, while leaving the other(s) in service. In the event of a partial closure, the procedures described in the following sections would apply to the unit(s) to be closed.

9.2.2 Final Closure

Final closure of the surface impoundments will consist of removal of all liquids, sludge, and contaminated soil and residue, as well as decontamination and verification sampling. Procedures to be followed are outlined in the remaining sections of this plan.

9.2.2.1 Liquids Removal

Prior to removal of liquids from the surface impoundments, one ~~random~~ sample of the liquid from each impoundment will be collected using a composite liquid waste sampler (Coliwasa) to obtain a vertical composite of fluids. The samples will be taken in accordance with procedures outlined in Section 9.3.1. The liquid samples will be analyzed for total metals, total volatile organics, and total BNA extractable organics.

Following sampling, liquids will be pumped from the surface impoundments into containers approved to store liquid mixed waste. The containers will be stored at an approved area until sample results are received and proper storage, treatment, or disposal methods are determined and available. The waste liquid will either be treated at LANL facilities or disposed of off site. All mixed or hazardous waste shipped off site will be manifested in accordance with 40 CFR Part 262, Subpart B. The waste transporter will have an EPA identification number in accordance with 40 CFR Part 263.11.

9.2.2.2 Sludge Removal

Sludge remaining in the impoundments after liquid removal will be sampled to determine appropriate storage, treatment, or disposal methods. Sampling points will be determined using a systematic ~~simple random~~ sample strategy, as described in Section 3.0. ~~The procedure for using this strategy is outlined in SW 846, Volume II, Part III. Figures 3-1 and 3-2 are example schematics of sampling grids.~~ Additional samples may be collected at areas suspected of being contaminated. Samples will be taken in accordance with procedures outlined in Section 9.3.2. Sludge will be analyzed for total ~~TCLP~~ metals ~~and organics~~, total volatile organics, and total BNA extractable organics.

Following sampling, sludge will be physically removed from the impoundment by pumping or excavation. The methods used for sampling and removal will depend on the physical characteristics of the sludge after liquid removal. Sludge and other solid residue will be stored in drums or containers approved to receive mixed waste until sample results are received and proper storage, treatment, or disposal methods can be determined and are available. All mixed or hazardous wastes shipped off site will be manifested in accordance with 40 CFR Part 262, Subpart B. The waste transporter will have an EPA identification number in accordance with 40 CFR Part 263.11.

9.2.2.3 Hazard Protection

Personnel involved with removing liquids and sludge from the impoundments, sampling, and decontamination will use the proper protective clothing and equipment. The Industrial Hygiene and Safety Group (HS-5) and the Health Physics Operations Group (HS-1) will be responsible for assessing hazards and determining personal protective clothing and equipment requirements. Good industrial hygiene practices shall be followed during all phases of closure and post-closure to protect employees from exposure to mixed waste. Contaminated protective clothing and protection equipment shall either be decontaminated or managed as a mixed waste.

9.2.2.4 Equipment Decontamination

All equipment used in sampling and removal of liquids and sludge will be scraped and brushed to remove waste residue. The residue collected will be placed in drums for storage, treatment, or disposal. The equipment will be decontaminated by washing with surfactants and steam cleaning. Rinsate will be collected and handled in the same manner as liquid from the surface impoundments.

9.2.2.5 Liner Decontamination Procedures

The Hypalon liner in the surface impoundment storing radioactive cooling water will be pre-washed using pressurized hot water to remove any remaining residue. Rinsate will be collected and handled in the same manner as liquid from the surface impoundment. Following the pre-wash, the liner will be scrubbed using a surfactant and rinsed with pressurized hot water. Steam will not be used as it may damage the liner. Rinsate from the second wash will be collected and handled in the same manner as liquid from the impoundment.

A representative sample of the rinsate will be collected and preserved in accordance with procedures presented in Section 9.3.1. The sample will be analyzed for total metals, total volatile organics, and total BNA extractables. Methods for storage, treatment, or disposal of the rinsate will depend on the results of the sampling. It is expected that rinsate from the second wash will not be mixed waste. A determination that the rinsate from the second wash is not mixed waste will indicate that the liner does not contain hazardous constituents which are leachable in quantities sufficient for the liner to be determined a mixed waste. The washing procedures will be repeated, as necessary, utilizing appropriate surfactant solutions until the rinsate is no longer a mixed waste.

9.3 SAMPLING AND ANALYTICAL PROCEDURES

This section outlines the procedures and methods to be used for sampling and analysis of the TA-53 surface impoundments waste. While the procedures and methods are specific, any applicable procedure or method prescribed in SW-846 may be used if found to be more

appropriate. All sampling and analytical procedures used will be annotated in the final closure report.

9.3.1 Waste Liquid and Rinsate Sampling

A Coliwasa sampler or similar device will be used to sample the liquid stored in the surface impoundments and to sample the rinsate used in cleaning equipment. The Coliwasa is recommended for the sampling; however, as an alternative to the Coliwasa, disposable glass sampler tubes may be used to sample liquids. The primary advantage in using a glass tube is that the tube will be used only once, thus eliminating the potential for cross contamination.

9.3.1.1 Cleaning of Sampler

The sampler must be clean before use. An unused disposable sampler may be presumed clean if still in a factory-sealed wrapper. Unsealed samplers will be cleaned prior to use; the used sampler must be washed with warm detergent solution (wash water solution should be analyzed for volatile and semivolatile organics and total ~~TCLP~~ metals prior to and after washing), rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped dry. A necessary piece of equipment for cleaning the tube of the Coliwasa is a bottle brush that fits tightly inside the diameter of the tube. The brush is connected to a rod of sufficient length to reach the entire length of the sampler tube. Improper cleaning of sample equipment will cause cross contamination of samples. Clean samplers should be stored in polyethylene plastic tubes or bags in a clean and protected area.

9.3.1.2 Sampling Procedures

The sampling procedure for waste liquid and rinsate using a Coliwasa is outlined below.

- Assemble the Coliwasa sampler.
- Make sure that the Coliwasa sampler is clean.
- Check to make sure the sampler is functioning properly. Adjust the locking mechanism, if necessary, to make sure the neoprene rubber stopper provides a tight closure.
- Wear necessary protective clothing and gear and observe required sampling precautions.
- Put the sampler in the open position by placing the stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.
- Slowly lower the Coliwasa sampler into the liquid at a rate that permits the level of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sampler tube is lower than that outside the sampler, the sampling rate is too fast and will result in a nonrepresentative sample.
- When the sampler stopper hits the bottom of the liquid container, push the sampler tube downward against the stopper to close the sampler. Lock the sampler in the closed position by turning the T-handle until it is upright and one end rests tightly on the locking block.
- Slowly withdraw the sampler from the container with one hand while wiping the sampler tube with a disposable cloth with the other hand.
- Carefully discharge the sample into a glass container by slowly opening the sampler. This is done by slowly pulling the lower end of the T-handle away from the locking block while the lower end of the sampler is positioned in the glass container.
- Cap the glass container, attach a label and seal, record in the field logbook, and complete the sample analysis request sheet and chain-of-custody record.
- Unscrew the T-handle of the sampler and disengage the locking block. Clean the sampler on-site or store the contaminated parts of the sampler in a plastic storage tube or bag for subsequent cleaning. Store used rags in plastic bags for subsequent disposal.

9.3.2 Sludge Sampling

Sludge samples from the impoundment bottoms will be obtained using the most appropriate sampler for the physical characteristics of the sludge. Sampling may be performed using either a core sampler, such as the Veihmeyer sampler, or simply a trowel or scoop if coring cannot be accomplished.

9.3.2.1 Cleaning of Sampling Equipment

The sampling equipment must be cleaned prior to use, unless it is still factory-sealed. Sampling equipment will be washed with a warm detergent solution, rinsed several times with tap water, rinsed with distilled water, and wiped or air-dried.

9.3.2.2 Sludge Sampling Procedures

Trowel or Scoop

- Take small, equal portions of sample from the surface or near the surface of the material to be sampled.
- Combine the samples in a glass container.
- Cap the container, attach a label and seal, record in field logbook, and complete the sample analysis request sheet and chain-of-custody record, and deliver the samples to the laboratory for analysis.

Veihmeyer Sampler

- Assemble the sampler by screwing in the tip and drive head on the sampling tube.
- Insert the tapered handle (drive guide) of the drive hammer through the drive head.
- Place the sampler in a perpendicular position on the material to be sampled.
- With the left hand holding the tube, drive the sampler into the ground/material to the desired sampling depth by pounding the drive head with the drive hammer. Do not drive the tube further than the tip of the hammer's drive guide.
- Record the length of the tube that penetrated the material.

- Move the drive hammer onto the drive head. In this position, the hammer serves as a handle for the sampler.
- Rotate the sampler at least two revolutions to shear off the sample at the bottom.
- Lower the sampler handle (hammer) until it just clears the two ear-like protrusions on the drive head and rotate about 90 degrees.
- Withdraw the sampler from the material by pulling the handle (hammer) upwards. When the sampler cannot be withdrawn by hand, as in deep soil sampling, use the puller jack and grip.
- Dislodge the hammer from the sampler, turn the sampler tube upside down, tap the head gently against the hammer, and carefully recover the sample from the tube. The sample should slip out easily.
- Store the core sample in a 1,000 or 2,000 ml (1 qt or 1/2 gal) sample container.
- Label the sample, affix the seals, record in the field logbook, complete the sample analysis request sheet and chain-of-custody record, and deliver the samples to the laboratory for analysis.

9.3.3 Soil Sampling

After removal of liquids, sludge, and liner materials, soil at the site of the impoundments will be sampled to determine horizontal and vertical extent of contamination. Soil samples will be analyzed for the same parameters as the sludge and liquid samples. Sampling points will be determined using the systematic ~~simple random~~ sample strategy introduced in Section 9.2.2.2.

Contaminated soils removed from the unit during closure activities will be packed in DOT-approved open-head drums, covered trucks, or other appropriate transportation containers, and transported to TA-54 for placement in storage, or sent directly to a permitted treatment, storage, and disposal (TSD) facility.

9.3.3.1 Cleaning of Sampler

It is important to clean the samplers after each site is sampled. An unused disposable sampler may be presumed clean if still in a factory-sealed wrapper. Unsealed samplers will be cleaned prior to use. The samplers will be washed with a warm solution, rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped dry.

9.3.3.2 Sampling Procedures

Soil sampling will be conducted using the same procedures as for sludge sampling (see Section 9.3.2.2).

9.3.4 Sample Handling and Documentation

Samples will be analyzed either at LANL or at a commercial laboratory. In either case, each sample will be labeled, sealed, and accompanied by a chain-of-custody and sample analysis request form. Figures 3-2 ~~3-3~~ through 3-7 ~~3-8~~ are examples of the documentation to be used for field sampling activities.

Sample containers appropriate for the requested analyses will be used for all samples. Sample containers, preservation, and holding times are provided in Table 3-1. Samples will be taken, placed in bottles, sealed, tagged, and immediately packed in vermiculite, sawdust, or, if refrigeration is required, an insulated container with ice.

The sample container must be sealed with a gummed paper seal attached to the container in such a way that the seal must be broken in order to open the container. The seal and sample tag must be completed with a waterproof pen. The sample label is necessary to prevent

misidentification of samples and shall include, if applicable, the grid number referenced to positions staked on the site perimeter. The sample label, if sent to an outside laboratory, must be completed to include the project name, sample number, collection date/time, collector's name, sample location, sample media description, preservative, and analysis requested. The field information in the case of soil sampling shall include observations such as the soil texture and surface appearance, ambient temperature and cloud cover at time of sampling, and precipitation conditions 24 hours before sampling.

The chain-of-custody form is necessary to trace sample possession from the time of collection and must accompany every sample. It is a two-page record with the original accompanying shipment and the copy retained by LANL, or, if analyzed at LANL, the original will be retained by LANL.

A field logbook will be kept and will contain all information pertinent to field surveys and sampling. The logbook shall have bound and consecutively numbered pages in 8-1/2 by 11-inch format. Minimum entries should include:

a. Purpose of sample (routine sampling, special sampling)
b. Location of sampling (coordinates referenced to staked field points, if soil sample)
c. Name and business address of person making log entry
d. Number and volume of sample
e. Description of each sampling location, sampling methodology, equipment used, etc.
f. Date and time of sample collection
g. Sample destination and transporter's name (name of laboratory, UPS, etc.)

h. Map or photograph of the sampling site, if any

i. Field observations (ambient temperature, sky conditions, past 24-hour precipitation, etc.)

j. Field measurements, if any (pH, conductivity, etc.)

k. Collector's sample identification number(s), and

l. Signature of person responsible for the log entry.

Sampling situations vary widely. No general rule can be given as to the extent of information that must be entered in the logbook. A good rule, however, is to record sufficient information so that someone can reconstruct the sampling situation without relying on the collector's memory.

The sample shipment and chain-of-custody documentation must be accompanied by a Request for Analysis Form. The Request for Analysis Form can provide information such as sample size, type, volume, and preservative, contact information, analytical tests to perform, QA/QC requirements, and requested disposition of the sample following analysis.

9.3.5 Sample Analysis

All sample analyses will be conducted using methods prescribed in SW-846, including those for quality assurance and quality control. The analytical methods expected to be employed for analysis of samples collected during closure activities are presented in Tables 3-2 and 3-3.

9.3.6 Field and Laboratory Quality Assurance/Quality Control

Field quality control activities will include collection of the following quality control samples: duplicate samples, trip blanks, field blanks, and rinsate blanks. Table 3-4 summarizes field quality control sample requirements.

One field duplicate sample will be collected for every 20 samples, or for the total number of samples collected per impoundment. Duplicate samples are two or more samples collected simultaneously into separate containers from the same source under identical conditions. Acceptance limits for field duplicate analyses are 0 to 20 relative percent difference (RPD) per analyte. Blank samples collected in the field will include trip blanks, field blanks, and equipment rinsate blanks. Frequency of blank samples will be no less than one in 20 samples, or one for the total number of samples collected per impoundment. Blank samples will be prepared from organic-free, deionized water that is taken into the field in sealed containers and poured into appropriate sample containers at predesignated locations. Blank samples and duplicate samples of liquid and soil will be analyzed for total metals, total volatile organics, and total BNA extractables. Duplicate samples of sludge will be analyzed for total ~~TCLP~~ metals, total volatile organics, and total BNA extractables.

In the laboratory, quality control samples are required to establish the accuracy and precision of the analytical data. Laboratory quality control procedures are presented in Table 3-5.

9.4 DECONTAMINATION VERIFICATION

If soil removal is deemed necessary, decontamination of the surface impoundments will be verified by additional sampling. Because removal of contaminated soil will leave an exposed surface, the surface will be resampled in the same locations. Analysis will be conducted only for those constituents that caused the area to be contaminated.

Successful decontamination is defined as:

1. No detectable hazardous constituents in the final sample, or
2. Detectable hazardous constituents in the final sample are equal to or less than, at the 0.01 confidence level, their concentration in the unused wash water or background sample.

An alternative demonstration of decontamination may be proposed and justified at the time of unit closure as circumstances indicate. The Secretary, NMED, will evaluate the proposed alternative in accordance with the standards and guidance then in effect and, if approved, incorporate the alternative by closure plan modification.

9.5 CLOSURE SCHEDULE

An estimated 180 days will be required to accomplish closure procedures and reporting requirements. The proposed year of partial closure of the NE and NW impoundments is 1995, and final closure for all impoundments is 2100. Closure will proceed by the schedule given in Table 9-1.

9.6 CLOSURE CERTIFICATION

An independent registered professional engineer and a LANL representative shall ensure that the closure follows the closure plan. Upon completion of closure, the engineer and the DOE shall prepare a letter certifying that the facility has been closed in accordance with this plan. The letter shall be dated and signed by each party, stamped by the registered engineer, and the original copy submitted by the DOE to the Secretary, NMED. One copy shall be maintained at the DOE office and one copy maintained by EM-~~8~~ 2.

9.7 QUALITY ASSURANCE/QUALITY CONTROL

A qualified individual or individuals shall be designated to independently oversee the closure activities and report directly to senior management on the quality of the performance of this closure. This individual will personally observe a portion of the key activities, assure that sample blanks are used and analyzed, and review the analysis reports for accuracy and adequacy. A written QA/QC plan prepared in accordance with SW-846 guidance shall be prepared and followed, with variations from the plan documented and explained. The designated individual shall prepare a written statement for the final report commenting on the adequacy of the analysis showing decontamination.

9.8 FINAL CLOSURE REPORT

Upon completion of the closure activities, a Final Closure Report shall be submitted to the Secretary, NMED. The report shall document the final closure and contain, at a minimum, the following:

A. The certification described in Section 9.6.

B. Any variance from the approved activities and the reason for the variance.

C. A tabular summary of all sampling results, showing:

   1. Sample identification

   2. Sampling location

   3. The datum reported

   4. Detection limit for each datum

   5. A measure of analytical precision (e.g., uncertainty, range, variance)

6. Identification of analytical procedure

7. Identification of analytical laboratory

D. A QA/QC statement on the adequacy of the analyses and the decontamination demonstration.

E. The location of the file of supporting documentation:

1. Field logbooks

2. Laboratory sample analysis reports

3. The QA/QC documentation

4. Chain-of-custody records

F. Disposition location of all regulated and nonregulated residues.

G. A certification of accuracy of the report.

9.9 POST-CLOSURE PLAN

LANL's intent is clean closure for the TA-53 surface impoundments; thus, a post-closure plan has not been prepared at this time. If, during the course of sampling and waste removal activities it is found that clean closure cannot be achieved, a post-closure care plan will be submitted.

TABLE 9-1

CLOSURE SCHEDULE

ACTIVITY	MAXIMUM TIME REQUIRED
Notify the NMED	-90 Days
Advertise for proposals	-90 Days
Receive proposals	-30 Days
Select contractor and award contract	-10 Days
Begin closure activities	Day 0
Characterize liquid and sludge waste in impoundments through sampling and analysis	Day 30
Removal of wastes and impoundment liners	Day 60
Soil sampling and analysis	Day 120
Final cleanup, including any soil removal	Day 130
Decontamination verification	Day 150
Submit final report to NMED	Day 180

NOTE:

The schedule above indicates calendar days from the beginning by which activities will be completed. Some activities may be conducted simultaneously.

10.0 CERTIFICATION

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

(By this certification, the undersigned representatives of DOE and the University of California certify that all the information contained in this application is, to the best of their knowledge, complete. ~~However, as noted in Sections 2.0 and 4.0 of the application, some information required by 40 CFR 270.17 is currently unavailable, but will be provided to the New Mexico Environment Department within six months of the submission of the application.)~~

Allen J. Tiedman
Associate Director for Support
Los Alamos National Laboratory
Operator

6-24-92
Date Signed

Jerry Bellows
Area Manager, Los Alamos Area Office
U.S. Department of Energy
Albuquerque Operations
Owner/Operator

6/25/92
Date Signed

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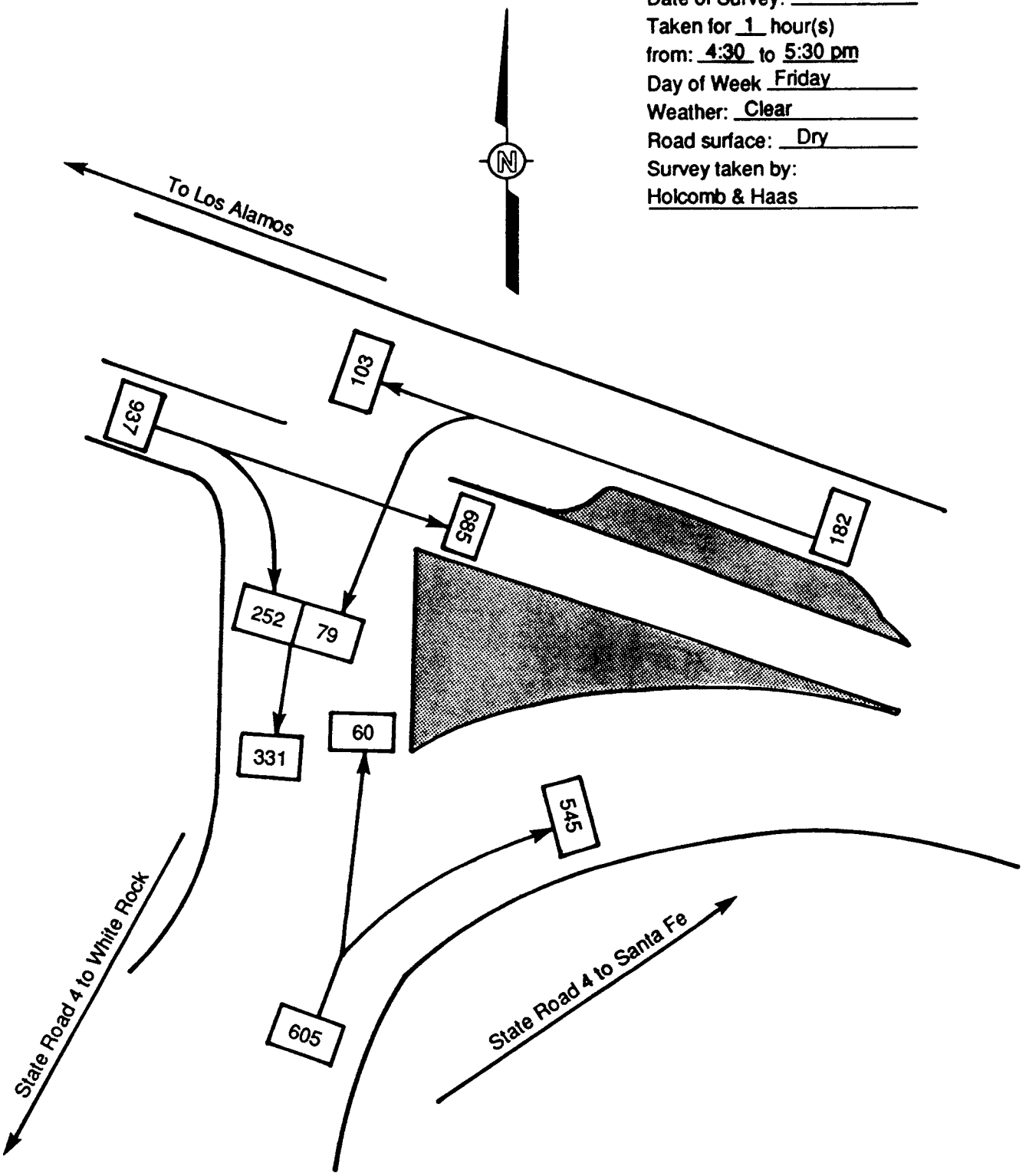
APPENDIX A

MAPS FROM "TA-3 TRAFFIC STUDY"
DEPICTING VEHICULAR COUNT MOVEMENTS AT VARIOUS INTERSECTIONS

TRAFFIC ENGINEERING DEPARTMENT
OF LOS ALAMOS COUNTY

Vehicular traffic count movements at the intersection of the White Rock Wye.

Date of Survey: 5/6/83
Taken for 1 hour(s)
from: 4:30 to 5:30 pm
Day of Week Friday
Weather: Clear
Road surface: Dry
Survey taken by:
Holcomb & Haas

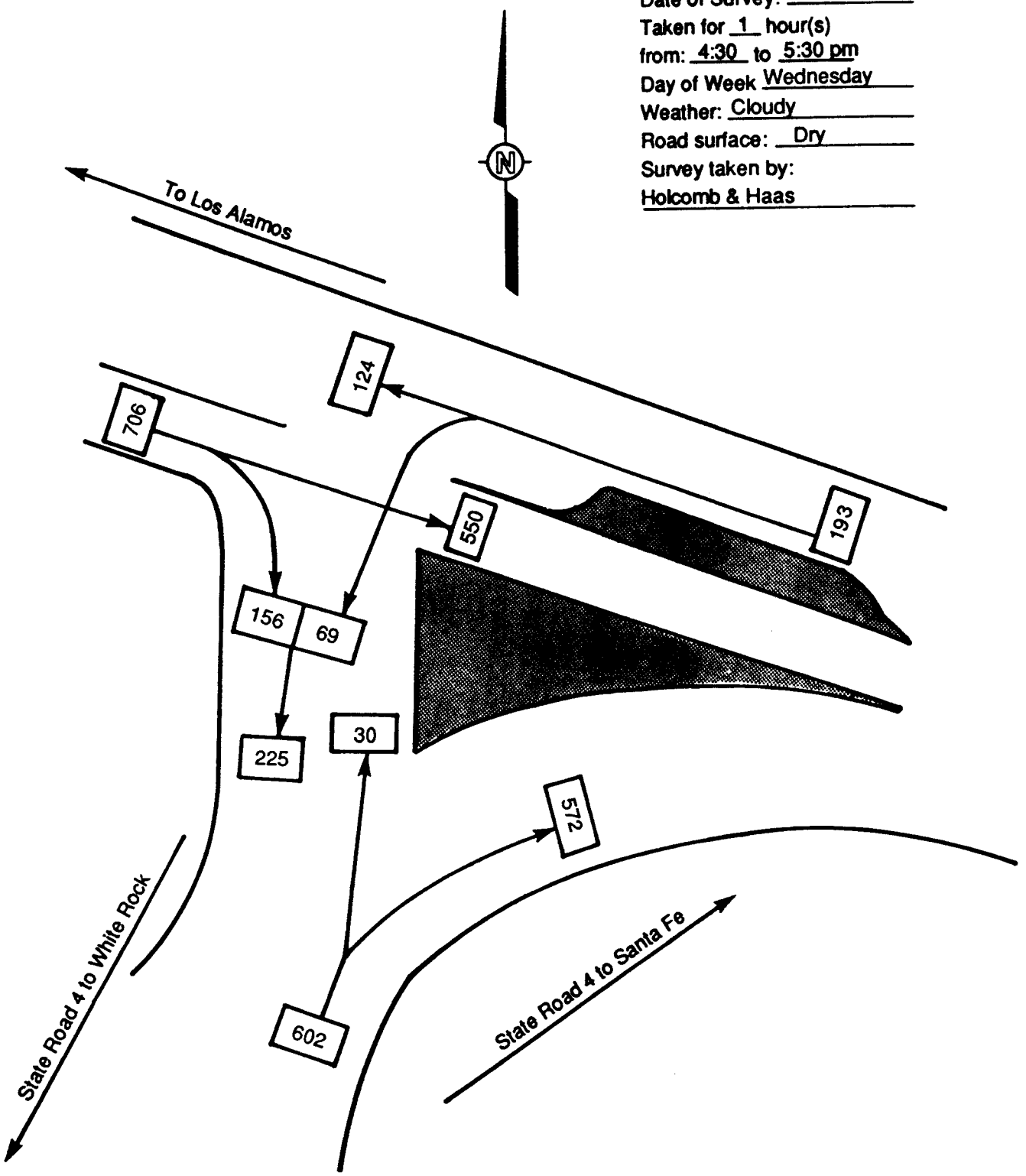


301215.01.09 A18

TRAFFIC ENGINEERING DEPARTMENT
OF LOS ALAMOS COUNTY

Vehicular traffic count movements at the intersection of the White Rock Wye.

Date of Survey: 4/13/83
Taken for 1 hour(s)
from: 4:30 to 5:30 pm
Day of Week Wednesday
Weather: Cloudy
Road surface: Dry
Survey taken by:
Holcomb & Haas

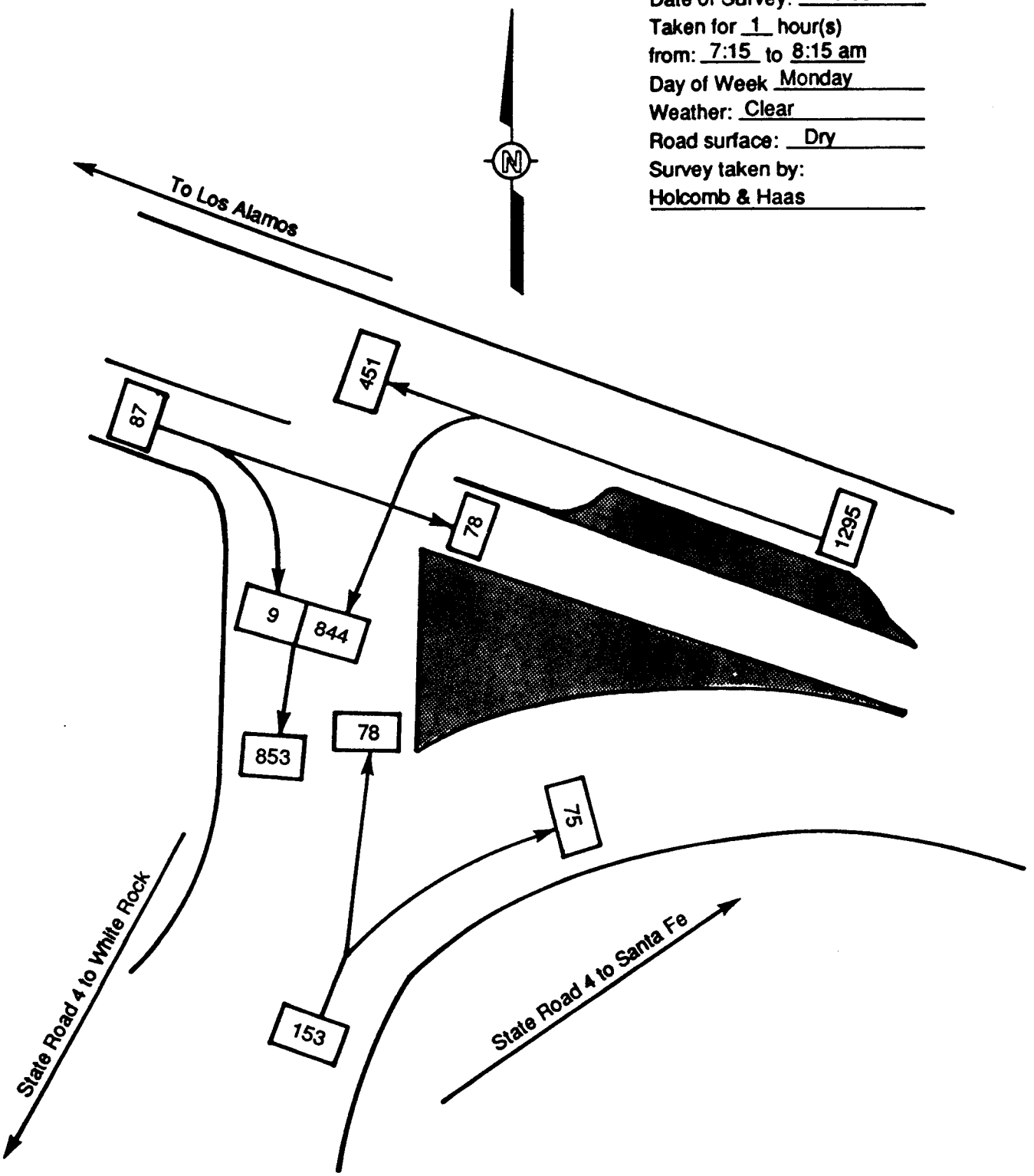


301215.01.09 A20

TRAFFIC ENGINEERING DEPARTMENT
OF LOS ALAMOS COUNTY

Vehicular traffic count movements at the intersection of the White Rock Wye.

Date of Survey: 4/18/83
Taken for 1 hour(s)
from: 7:15 to 8:15 am
Day of Week Monday
Weather: Clear
Road surface: Dry
Survey taken by:
Holcomb & Haas

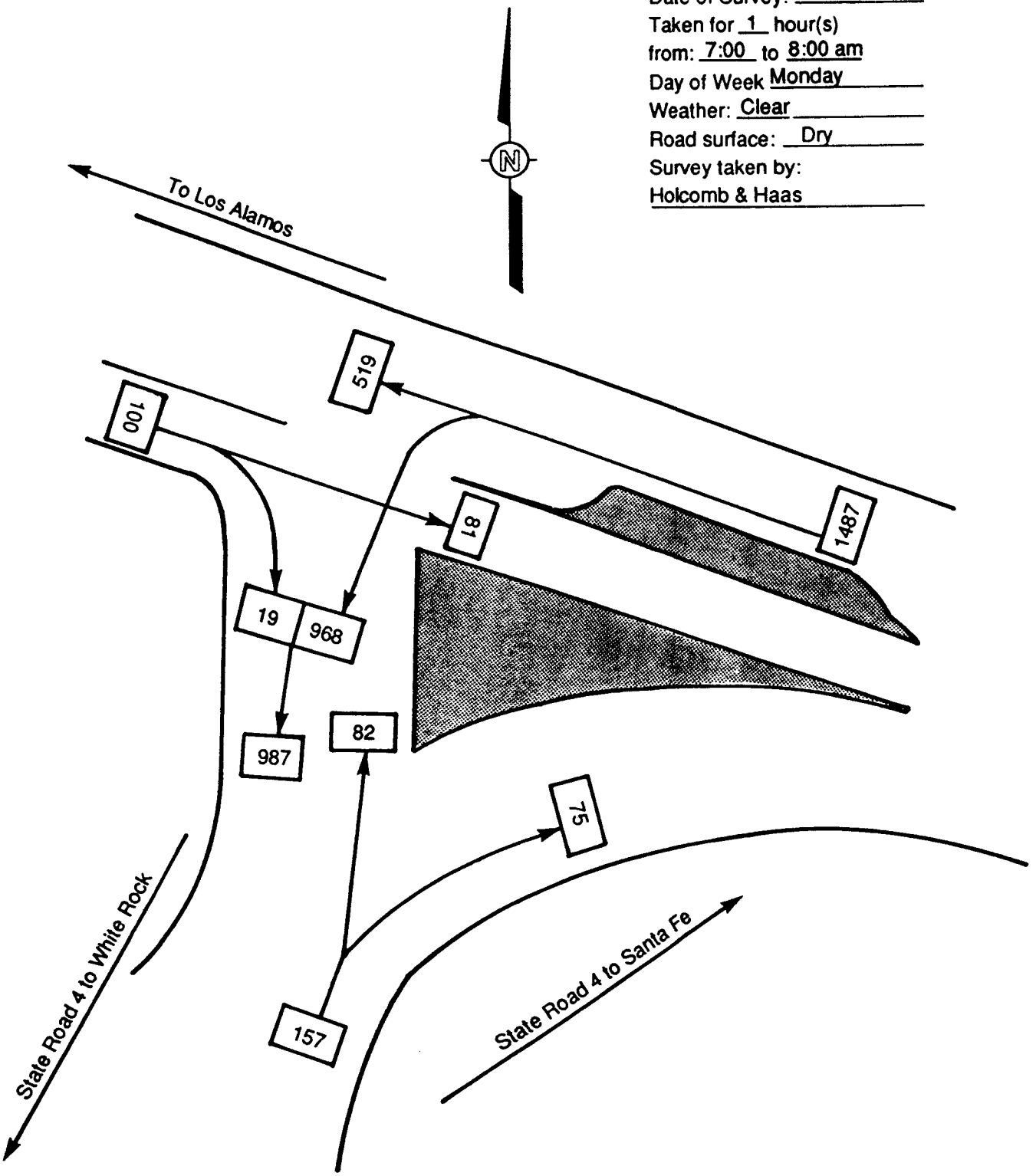


301215.01.09 A19

TRAFFIC ENGINEERING DEPARTMENT
OF LOS ALAMOS COUNTY

Vehicular traffic count movements at the intersection of the White Rock Wye.

Date of Survey: 5/9/83
Taken for 1 hour(s)
from: 7:00 to 8:00 am
Day of Week Monday
Weather: Clear
Road surface: Dry
Survey taken by:
Holcomb & Haas



301215.01.09 A21

APPENDIX B

ENGINEERING CERTIFICATION OF CONSTRUCTION

MEMORANDUM TO FILE 24 JULY, 1991

FROM: DAVE SNEESBY, ENG-8

LAGOON UPGRADE TA-53; PID# 8110-53; WO 6-9004-46

SUBJECT: CERTIFICATION OF CONSTRUCTION

As project planner on this job, I can certify that to the best of my knowledge, this project was completed in conformance to the Zia Co. drawings ENG-C 44772 (DOE DWG NO LA-RDT-AE-C). Gordon Foreman was the construction project manager for the Zia Co. He and I were included in the final inspection and punch list resolution, and all deficiencies were satisfied.

The pond constructed on this work order was originally the third of three sanitary sewage treatment ponds which were operated in series for approximately four years. In 1989 the connection to the northern two ponds was valved off, and this third pond was converted to receive radioactive waste, and piping of radioactive liquid waste was permanently diverted to not flow to the northern two ponds.

7-24-91

APPENDIX C

NUCLEAR DENSITY DETERMINATIONS FOR TA-53-166 SOUTH SURFACE IMPOUNDMENT

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 9/23/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2	3	4
B. Test Location: Lagoon Bottom, sand cushion	40' W & 60' S of NE Corner @ f/g	40' W & 60' N of SE Corner @ f/g	12' N & 50' W of. SE corner @ f/g	12' N & 125' W of SE Corner @ f/g
C. Proctor Max.:	130.5	130.5	130.5	130.5
D. Optimum Moisture:				
E. Wet Density:	134.8	129.7	139.1	134.2
F. Dry Density:	127.1	124.0	131.7	127.4
G. Inplace Moisture:	5.9	4.5	5.5	5.3
H. % Compaction Req :	85	85	85	85
I. Actual % Compaction:	97.4	95.0	100.9	97.6
Tested By:	V Penny & T. Stone	✓	✓	✓

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 9/19/95

Project: TA-53 Lagoons

ASTM Method: D 2922

A. Test Number:	1	2	3	4
B. Test Location: Inside Embankment of New Lagoon	40' S of NW Corner @ f/g	70' S of NW Corner @ f/g	50' N of SW Corner @ f/g	50' E of SW Corner @ f/g
C. Proctor Max.:	126.7	126.7	126.7	126.7
D. Optimum Moisture:	9.2	9.2	9.2	9.2
E. Wet Density:	122.8	118.2	106.8	114.1
F. Dry Density:	115.1	109.9	99.0	105.0
G. Inplace Moisture:	6.6	7.4	7.7	8.5
H. % Compaction Req :	85	85	85	85
I. Actual % Compaction:	90.8	86.7	78.2	82.9
Tested By: V Penny	✓	✓	✓	✓

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45

Date Tested: 9/18/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2	3	4
B. Test Location: North Embankment Sand Liner	75' E of NW corner @ f/g	110' E of NW corner @ f/g	170' E of NW corner @ f/g	140' W. of NE corner @ f/g
C. Proctor Max.:	126.7	126.7	126.7	126.7
D. Optimum Moisture:	9.2	9.2	9.2	9.2
E. Wet Density:	118.9	104.7	123.4	119.8
F. Dry Density:	110.6	93.1	110.3	108.6
G. Inplace Moisture:	7.5	12.5	11.9	10.4
H. % Compaction Req :	85	85	85	85
I. Actual % Compaction:	87.3	73.5	87.1	85.7
Tested By: V. Penny	✓	✓	✓	✓

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45

Date Tested: 3/26/35

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:				
B. Test Location: E. Roadway	45' south of N end 5' W ℄ @ fsg	65' North of south end, 5' E of ℄ @ fsg		
C. Proctor Max.:	102.9	102.9		
D. Optimum Moisture:	15.5	15.5		
E. Wet Density:	111.6	105.1		
F. Dry Density:	98.3	93.6		
G. Inplace Moisture:	13.4	12.1		
H. % Compaction Req :	95	95		
I. Actual % Compaction:	95.5	91.0		
Tested By: V Penny	✓	✓		

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/22/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2	3	
B. Test Location: New Lagoon Embankment	80' South of NE corner @ f.sg.	75' North of SE corner @ f.sg.	30' W of SE corner @ f.sg.	
C. Proctor Max.:	102.9	102.9	102.9	
D. Optimum Moisture:	15.5	15.5	15.5	
E. Wet Density:	116.5	120.2	111.1	
F. Dry Density:	100.9	103.2	97.9	
G. Inplace Moisture:	15.5	16.5	13.3	
H. % Compaction Req :	95	95	95	
I. Actual % Compaction:	98.1	100.3	95.2	
Tested By: V. Penny	✓	✓	✓	

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/21/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2		
B. Test Location: New Lagoon Embankment	75' south of NE corner, fsg-2'	30' south of NE corner, fsg-2'		
C. Proctor Max.:	102.9	102.9		
D. Optimum Moisture:	15.5	15.5		
E. Wet Density:	115.1	109.9		
F. Dry Density:	97.8	95.1		
G. Inplace Moisture:	17.5	15.4		
H. % Compaction Req :	90	90		
I. Actual % Compaction:	95.1	92.5		
Tested By: V Penny	✓	✓		

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/20/85

Project: TA-33 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2	3	4
B. Test Location: New Lagoon Embankment	25' N of SE Corner fsg-0.5'	100' south of NE Corner fsg-1.5'	30' W of SE Corner fsg-0.5'	Retest of No. 1
C. Proctor Max.:	102.9	102.9	102.9	102.9
D. Optimum Moisture:	15.5	15.5	15.5	15.5
E. Wet Density:	106.0	111.6	108.8	108.0
F. Dry Density:	92.5	94.0	91.5	94.9
G. Inplace Moisture:	14.4	18.6	18.7	13.6
H. % Compaction Req :	95	90	95	95
I. Actual % Compaction:	89.9	91.3	88.9	92.2
Tested By: V. Penny	✓	✓	✓	✓

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/20/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	5			
B. Test Location: New Lagoon Embankment	50' south of NE corner fsg-4'			
C. Proctor Max.:	102.9			
D. Optimum Moisture:	15.5			
E. Wet Density:	115.1			
F. Dry Density:	94.9			
G. Inplace Moisture:	21.1			
H. % Compaction Req :	90			
I. Actual % Compaction:	92.2			
Tested By: V. Penny	✓			

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/19/85

Project: TA-53 Lagoon Upgrade ASTM Method: D 2922

A. Test Number:	1	2	3	4
B. Test Location: New Lagoon Embankment	Retest of No. 5 taken 8/16/85	Retest of No. 6 taken 8/16/85	40' W of SE Corner f.sg-2'	75' South of NE Corner f.s.g.-4'
C. Proctor Max.:	102.9	102.9	102.9	102.9
D. Optimum Moisture:	15.5	15.5	15.5	15.5
E. Wet Density:	112.1	111.5	113.9	112.4
F. Dry Density:	96.3	95.1	99.1	97.8
G. Inplace Moisture:	16.2	17.1	14.8	14.8
H. % Compaction Req :	90	90	90	90
I. Actual % Compaction:	93.6	92.4	96.3	95.1
Tested By: V. Penny	✓	✓	✓	✓

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/19/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	5	6		
B. Test Location: New Lagoon Embankment	50' N of SE corner f sg - 3.5'	30' W of SE corner f sg - 1'		
C. Proctor Max.:	102.9	102.9		
D. Optimum Moisture:	15.5	15.5		
E. Wet Density:	108.5	114.0		
F. Dry Density:	93.4	97.2		
G. Inplace Moisture:	16.0	17.1		
H. % Compaction Req :	90	90		
I. Actual % Compaction:	90.8	94.5		
Tested By: V Penny	✓	✓		

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzalez
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/16/85

Project: TA-53 Lagoon Upgrade ASTM Method: D 2922

A. Test Number:	5	6		
B. Test Location: New Lagoon Em-Bankment	75' N. of SE Corner fsg-5'	Retest of Test #5		
C. Proctor Max.:	102.9	102.9		
D. Optimum Moisture:	15.5	15.5		
E. Wet Density:	105.9	103.7		
F. Dry Density:	90.0	90.8		
G. Inplace Moisture:	17.5	14.0		
H. % Compaction Req :	90%	90%		
I. Actual % Compaction:	87.4	88.3		
Tested By: V Penny	✓	✓		

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/15/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2	3	4
B. Test Location: New Lagoon Embankment	Retest of No. 6 Taken 8/12/85	Retest of No. 7 taken 8/12/85	45' W of SE Corner fsg-3'	110' East of SW Corner @ f.s.g.
C. Proctor Max.:	102.9	102.9	102.9	102.9
D. Optimum Moisture:	15.5	15.5	15.5	15.5
E. Wet Density:	112.8	109.7	105.8	114.0
F. Dry Density:	97.0	95.1	94.4	99.5
G. Inplace Moisture:	16.1	15.2	11.9	14.4
H. % Compaction Req :	90	90	90	95
I. Actual % Compaction:	94.3	92.4	91.7	96.7
Tested By: V. Penny	✓	✓	✓	✓

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 5/15/85

Project: TA-53 Lagoon Upgrade ASTM Method: D 2922

A. Test Number:	5	6	7	
B. Test Location: New Lagoon Embankment	75' N of SE Corner f sg - 6.5'	75' south of NE corner f sg - 6.5'	50' W. of SE corner f sg - 3'	
C. Proctor Max.:	102.9	102.9	102.9	
D. Optimum Moisture:	15.5	15.5	15.5	
E. Wet Density:	120.0	118.1	113.8	
F. Dry Density:	101.7	100.2	97.2	
G. Inplace Moisture:	17.8	17.7	17.0	
H. % Compaction Req :	90	90	90	
I. Actual % Compaction:	98.9	97.4	94.5	
Tested By: V. Penny	✓	✓	✓	

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/16/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2	3	4
B. Test Location: New Lagoon Embankment	50' south of NE corner fsg-6'	50' N of SE corner fsg-55'	75' W of SE Corner fsg-1'	75' south of NE corner fsg-5'
C. Proctor Max.:	102.9	102.9	102.9	102.9
D. Optimum Moisture:	15.5	15.5	15.5	15.5
E. Wet Density:	109.4	110.5	111.3	109.2
F. Dry Density:	95.1	96.2	96.2	93.9
G. Inplace Moisture:	14.9	14.7	15.5	16.1
H. % Compaction Req :	90%	90%	90%	90%
I. Actual % Compaction:	92.4	93.5	93.5	91.2
Tested By: V Penny	✓	✓	✓	✓

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/14/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2	3	4
B. Test Location: New Lagoon Embankment	30' N of SE Corner fsg-10'	60' south of NE Corner fsg-10'	12' N of SE Corner fsg-9'	100' south of NE Corner fsg-9'
C. Proctor Max.:	102.9	102.9	102.9	102.9
D. Optimum Moisture:	15.5	15.5	15.5	15.5
E. Wet Density:	104.6	105.7	113.1	114.4
F. Dry Density:	92.4	92.9	96.2	97.3
G. Inplace Moisture:	13.0	13.6	17.6	17.4
H. % Compaction Req :	90%	90%	90%	90%
I. Actual % Compaction:	89.8	90.3	93.5	94.5
Tested By: V. Penny	✓	✓	✓	✓

Machine Number: M28032221 (M22114673)

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/14/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	5	6	7	
B. Test Location: New Lagoon Embankment	Retest of # 6 from 8/13/85	30' N of SE Corner fsg-5.5'	60' south of NE Corner fsg-7.5'	
C. Proctor Max.:	102.9	102.9	102.9	
D. Optimum Moisture:	15.5	15.5	15.5	
E. Wet Density:	115.9	104.8	106.7	
F. Dry Density:	99.7	90.8	91.2	
G. Inplace Moisture:	16.1	15.2	16.8	
H. % Compaction Req :	95	90	90	
I. Actual % Compaction:	96.9	88.3	88.6	
Tested By: √ Penny	✓	✓	✓	

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/13/85

Project: TA-53 Lagoon Upgrade ASTM Method: D 2922

A. Test Number:	5	6		
B. Test Location: Lagoon Embankment	Retest of Test #1	Retest of Test #2		
C. Proctor Max.:	102.9	102.9		
D. Optimum Moisture:	15.5	15.5		
E. Wet Density:	118.1	107.2		
F. Dry Density:	103.0	94.5		
G. Inplace Moisture:	14.5	13.3		
H. % Compaction Req :	95	95		
I. Actual % Compaction:	100.1	91.9		
Tested By: V. Penny	✓	✓		

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

The Retest of test #2 failed

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/13/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2	3	4
B. Test Location: Lagoon Embankment	30' South of NW corner @ f sg	70' N of SW corner @ f.s.g.	50' so. of NE Corner f sg - 10'	45' N. of SE corner f sg - 10'
C. Proctor Max.:	102.9	102.9	102.9	102.9
D. Optimum Moisture:	15.5	15.5	15.5	15.5
E. Wet Density:	103.5	116.9	114.1	110.6
F. Dry Density:	90.5	95.2	97.5	97.6
G. Inplace Moisture:	14.2	12.1	16.9	13.7
H. % Compaction Req :	95	95	90	90
I. Actual % Compaction:	88.0	92.5	94.7	94.8
Tested By: V. Penny	✓	✓	✓	✓

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Tests No, 1 & 2 failed specification requirements. Need to rework & retest.

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/12/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2		
B. Test Location: East side of Embankment	Retest of test #4	50' N of SE corner of sq-11'		
C. Proctor Max.:	102.9	102.9		
D. Optimum Moisture:	15.5	15.5		
E. Wet Density:	116.8	118.6		
F. Dry Density:	99.0	99.1		
G. Inplace Moisture:	17.8	19.5		
H. % Compaction Req :	90	90		
I. Actual % Compaction:	96.3	96.3		
Tested By:	V Penny	~		

Machine Number: M28032221 M22114673

Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

THE ZIA COMPANY

NUCLEAR DENSITY
DETERMINATION

W.O. No.: 9069-45 Date Tested: 8/8/85

Project: TA-53 Lagoon Upgrade

ASTM Method: D 2922

A. Test Number:	1	2		
B. Test Location: Lagoon Embankment	Middle of West side fsg-2'	25' W of SE Corner fsg-7'		
C. Proctor Max.:	101.9	101.9		
D. Optimum Moisture:	15.5	15.5		
E. Wet Density:	103.7	105.1		
F. Dry Density:	93.3	95.8		
G. Inplace Moisture:	11.1	9.6		
H. % Compaction Req :	90%	90%		
I. Actual % Compaction:	91.6	94.0		
Tested By:				

Machine Number: M28032221 M22114673

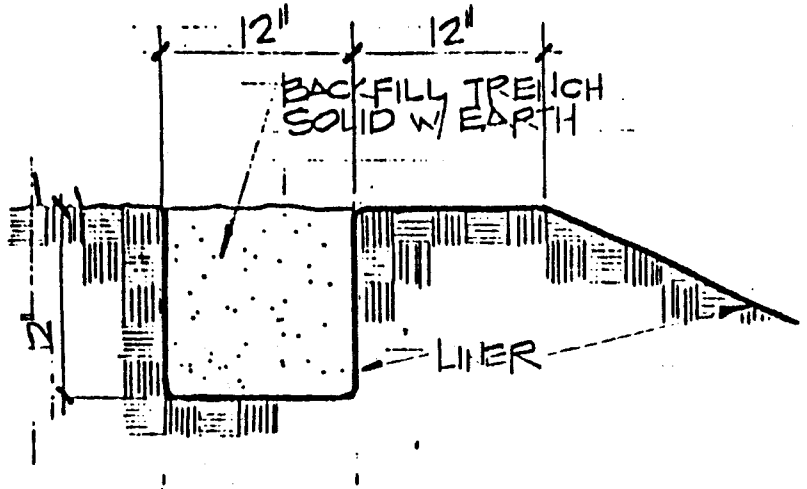
Comments: (Clarify Location, Station/Elevation)

Requested By: QA Plan Requirement or Gloria Gonzales
Name of Requesting Individual

EQAD FORM: SOILS 2

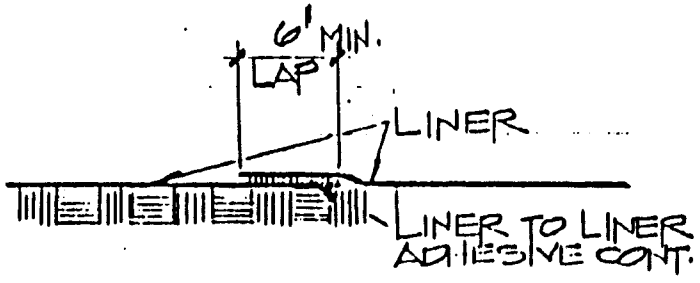
APPENDIX D

LINER DETAILS
FOR TA-53-166 SOUTH
SURFACE IMPOUNDMENT



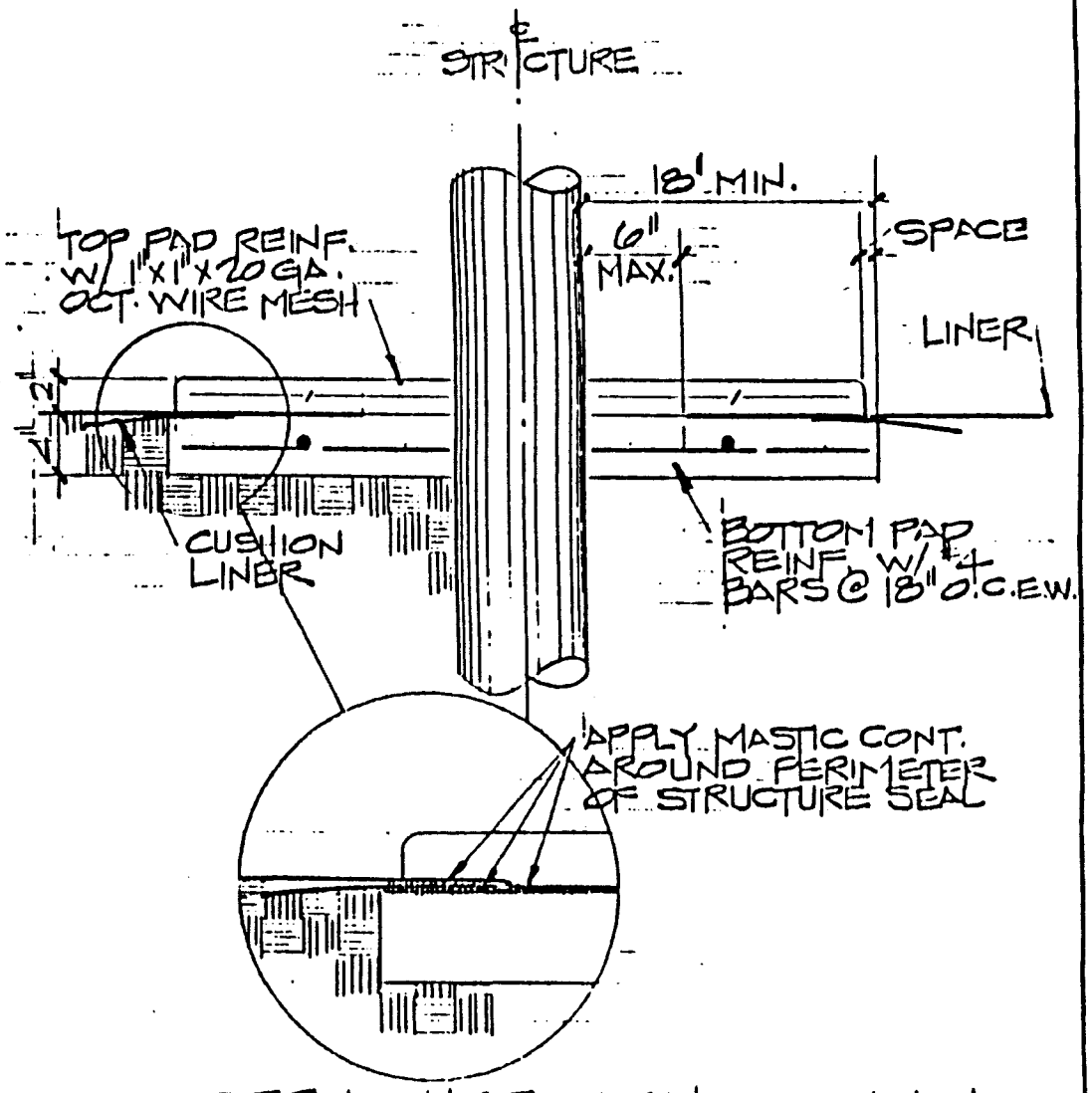
ANCHOR TRENCH
SCALE: 1"=1'-0"

A



FIELD SEAM
SCALE: 1"=1'-0"

B



C STRUCTURE SEAL SC. 1"=1'-0"

FALCO LININGS, INC.
7571 SANTA RITA CIRCLE
STANTON, CA. 90630
714-895-0967

LINER DETAILS

4-22-80, RAM

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June 1992
Revision 1.0

RCRA Part B Permit Application

Surface Impoundments
Technical Area 53

Los Alamos National Laboratory
Environmental Protection Group EM-8
Los Alamos, New Mexico 87545

Volume II

APPENDIX E

SAMPLE DATA
FROM BOREHOLES
AT TA-53 SURFACE IMPOUNDMENTS

Tritium Analysis Data
for
Boreholes 1-5 and "B"

Preliminary Data Summary from Auger Samples around LAMPF Lagoons, June 24, 1991

- Typical HSE-9 detection limit for tritium in soil moisture: 0.7 nCi/L

- Background tritium in precipitation in northern NM beyond LANL influence was about 0.065 nCi/L (20 TU) or, in the vicinity of LAMPF, about 0.17 - 0.300 nCi/L (52 -90 TU) in 1990.

- Average annual concentrations discharged from lagoons in recent years:

1985	710 nCi/L
1986	3100
1987	2700
1988	2100
1989	19000

Tritium Concentration (nCi/L)

Depth	Hole 1	Hole 2	Hole 3	Hole 4	Hole 5	Hole B
Surface	4.2	2.4	19.6	16.4	16.3	<0.1
5	8.5	2.4	9.0	9.8	32.1	0.1
10	2.1	1.9	6.1	2.9	48.7	<0.1
15	2.1	3.2	1.6	1.2	66.5	1.0
20	1.5	3.7	1.3	1.3	54.6	0.65
25	0.5	3.2	1.5	0.4	38.6	0.4
30	0.5	6.1	1.3	0.2	34.2	0.4
35	2.6	5.6	0.7	0.5	48.5	0.1
40	2.4	6.1	0.7	0.3	66.9	0.3
45	0.2	5.8	1.6	0.2	65.9	0.5
50	3.4	6.9	0.1	0.3	69.3	0.5
Bit	2.4	3.4	6.9	1.2	26.5	0.0
60					62.4	
70					100.4	
80					88.4	
90					60.3	
100					34.7	

Gravimetric Moisture in Percent

Depth	Hole 1	Hole 2	Hole 3	Hole 4	Hole 5	Hole B
Surface	2.9	3.2	3.5	3.7	8.3	12.7
5	8.8	3.8	20.8	11.	9.	9.8
10	2.2	12.6	8.7	6.2	4.3	1.9
15	2.6	7.4	16.4	9.1	2.5	0.9
20	2.6	7.7	8.4	8.0	6.9	1.7
25	2.7	6.8	6.9	7.8	7.4	2.6
30	2.8	6.3	9.7	3.1	7.3	2.0
35	2.5	5.9	2.7	5.5	6.5	1.7
40	2.4		3.2	4.5	1.	1.7
45	2.7	6.1	6.4	1.9	5.6	2.2
50	2.7	6.3	3.8	8.0	6.4	2.7
Bit	2.6	11.6	4.1	3.	7.3	0.9
60					6.4	
70					3.4	
80					2.	
90					6.5	
100					9.8	

REPORT NUMBER: 10676

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: DK on 25-Jun-1991

ANALYSIS: H-3 REQUEST NUMBER: 11620 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE :

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-1-S	91.05173	2700.	300.	PCI/L	6/25/91	
AB-1-SQAQC	91.05174	3400.	300.	PCI/L	6/25/91	
AB-1-5'	91.05175	5500.	600.	PCI/L	6/25/91	
AB-1-10'	91.05176	3200.	300.	PCI/L	6/25/91	
AB-1-15'	91.05177	1000.	300.	PCI/L	6/25/91	
AB-1-20'	91.05178	600.	300.	PCI/L	6/25/91	
AB-1-25'	91.05179	400.	300.	PCI/L	6/25/91	
AB-1-30'	91.05180	300.	300.	PCI/L	6/25/91	
AB-1-35'	91.05181	500.	300.	PCI/L	6/25/91	
AB-1-40'	91.05182	600.	300.	PCI/L	6/25/91	
AB-1-45'	91.05183	500.	300.	PCI/L	6/25/91	
AB-1-50'	91.05184	500.	300.	PCI/L	6/25/91	
AB-1-BIT	91.05185	1300.	300.	PCI/L	6/25/91	
AB-2-S	91.05186	2600.	300.	PCI/L	6/25/91	
AB-2-5'	91.05187	2100.	300.	PCI/L	6/25/91	
AB-2-10'	91.05188	1500.	300.	PCI/L	6/25/91	
AB-2-15'	91.05189	1600.	300.	PCI/L	6/25/91	
AB-2-20'	91.05190	3200.	300.	PCI/L	6/25/91	
AB-2-25'	91.05191	3500.	400.	PCI/L	6/25/91	
AB-2-30'	91.05192	3600.	400.	PCI/L	6/25/91	
AB-2-35'	91.05193	3800.	400.	PCI/L	6/25/91	
AB-2-40'	91.05194	4700.	500.	PCI/L	6/25/91	
AB-2-45'	91.05195	4500.	500.	PCI/L	6/25/91	
AB-2-50'	91.05196	4400.	400.	PCI/L	6/25/91	
AB-2-BIT	91.05197	1600.	300.	PCI/L	6/25/91	
AB-3-S	91.05198	17500.	2000.	PCI/L	6/25/91	
AB-3-5'	91.05199	5800.	600.	PCI/L	6/25/91	
AB-3-10'	91.05200	1000.	300.	PCI/L	6/25/91	
AB-3-15'	91.05201	400.	300.	PCI/L	6/25/91	
AB-3-20'	91.05202	1400.	300.	PCI/L	6/25/91	
AB-3-25'	91.05203	1500.	300.	PCI/L	6/25/91	
AB-3-30'	91.05204	1300.	300.	PCI/L	6/25/91	
AB-3-35'	91.05205	800.	300.	PCI/L	6/25/91	
AB-3-40'	91.05206	700.	300.	PCI/L	6/25/91	
AB-3-45'	91.05207	1700.	300.	PCI/L	6/25/91	
AB-3-50'	91.05208	100.	300.	PCI/L	6/25/91	
AB-3-BIT	91.05209	7000.	700.	PCI/L	6/25/91	
AB-4-S	91.05210	16400.	2000.	PCI/L	6/25/91	
AB-4-5'	91.05211	10000.	1000.	PCI/L	6/25/91	

AB-4-10'	91.05212	2900.	300.	PCI/L	6/25/91
AB-4-15'	91.05219	1200.	300.	PCI/L	6/25/91
AB-4-20'	91.05220	1300.	300.	PCI/L	6/25/91
AB-4-25'	91.05221	400.	300.	PCI/L	6/25/91
AB-4-30'	91.05222	200.	300.	PCI/L	6/25/91
AB-4-35'	91.05223	600.	300.	PCI/L	6/25/91
AB-4-40'	91.05224	300.	300.	PCI/L	6/25/91
AB-4-45'	91.05225	200.	300.	PCI/L	6/25/91
AB-4-50'	91.05226	400.	300.	PCI/L	6/25/91
AB-4-BIT	91.05227	1200.	300.	PCI/L	6/25/91

****

REPORT NUMBER: 10676 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: DK on 25-Jun-1991

REQUEST NUMBER: 11620 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT
00.22385	00.22385	200.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
00.22385	00.22385	100.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
00.22385	00.22385	400.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
00.22386	00.22386	15800.	2000.	PCI/L	18430.	370.	6/25/91	UNDER CONTROL
00.22386	00.22386	16500.	2000.	PCI/L	18430.	370.	6/25/91	UNDER CONTROL
00.22386	00.22386	14900.	1000.	PCI/L	18430.	370.	6/25/91	OUT OF CONTROL

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

SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT
91.05169	700.	300.	PCI/L	0.0		6/25/91	WARNING 2-3 SIG
91.05170	200.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
91.05171	200.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
91.05172	19.1	2.	NCI/L	22.	0.6	6/25/91	UNDER CONTROL
91.05521	19.7	2.	NCI/L	18.3	0.5	6/25/91	UNDER CONTROL
91.05522	1100.	400.	PCI/L	0.0		6/25/91	WARNING 2-3 SIG
91.05523	78.4	8.	NCI/L	91.6	2.4	6/25/91	UNDER CONTROL

REPORT NUMBER: 10676

OK for RJP	DKnock	[illegible]
Analyst	Section Leader	QA Officer
6-25-91	6-25-91	6/25/91
Date	Date	Date

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.

****

REPORT NUMBER: 10678

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: DK on 25-Jun-1991

ANALYSIS: H-3 REQUEST NUMBER: 11640 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE :

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-5-S	91.05491	17400.	2000.	PCI/L	6/25/91	
AB-5-5'	91.05492	32100.	3000.	PCI/L	6/25/91	
AB-5-10'	91.05493	48700.	5000.	PCI/L	6/25/91	
AB-5-15'	91.05494	66500.	7000.	PCI/L	6/25/91	
AB-5-20'	91.05495	54600.	5000.	PCI/L	6/25/91	
AB-5-25'	91.05496	38700.	4000.	PCI/L	6/25/91	
AB-5-30'	91.05497	34200.	3000.	PCI/L	6/25/91	
AB-5-35'	91.05498	48500.	5000.	PCI/L	6/25/91	
AB-5-40'	91.05499	66900.	7000.	PCI/L	6/25/91	
AB-5-45'	91.05500	65900.	7000.	PCI/L	6/25/91	
AB-5-50'	91.05501	69300.	7000.	PCI/L	6/25/91	
AB-5-BIT	91.05502	44200.	400.	PCI/L	6/25/91	3 ML
AB-5-60'	91.05503	62500.	6000.	PCI/L	6/25/91	
AB-5-70'	91.05504	104.	10.	NCI/L	6/25/91	NOTE UNITS
AB-5-80'	91.05505	88400.	9000.	PCI/L	6/25/91	
AB-5-90'	91.05506	60300.	6000.	PCI/L	6/25/91	
AB-5-100'	91.05507	34700.	3000.	PCI/L	6/25/91	
AB-B-S	91.05508	1000.	300.	PCI/L	6/25/91	
AB-B-S-QA/QC	91.05509	700.	300.	PCI/L	6/25/91	
AB-B-5'	91.05510	1200.	300.	PCI/L	6/25/91	
AB-B-10'	91.05511	800.	300.	PCI/L	6/25/91	3 ML
AB-B-15'	91.05512	1000.	300.	PCI/L	6/25/91	
AB-B-20'	91.05513	500.	300.	PCI/L	6/25/91	
AB-B-25'	91.05514	700.	300.	PCI/L	6/25/91	3 ML
AB-B-30'	91.05515	700.	300.	PCI/L	6/25/91	3 ML
AB-B-35'	91.05516	600.	300.	PCI/L	6/25/91	1 ML
AB-B-40'	91.05517	700.	300.	PCI/L	6/25/91	2 ML
AB-B-45'	91.05518	1300.	400.	PCI/L	6/25/91	2 ML
AB-B-50'	91.05519	1400.	400.	PCI/L	6/25/91	2 ML
AB-B-BIT	91.05520	500.	400.	PCI/L	6/25/91	0.7 ML

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REPORT NUMBER: 10678 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: DK on 25-Jun-1991

REQUEST NUMBER: 11640 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT
00.22385	00.22385	400.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
00.22385	00.22385	200.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
00.22385	00.22385	100.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
00.22386	00.22386	15800.	2000.	PCI/L	18430.	370.	6/25/91	UNDER CONTROL
00.22386	00.22386	16500.	2000.	PCI/L	18430.	370.	6/25/91	UNDER CONTROL
00.22386	00.22386	14900.	1000.	PCI/L	18430.	370.	6/25/91	OUT OF CONTROL

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

SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT
91.05169	700.	300.	PCI/L	0.0		6/25/91	WARNING 2-3 SIG
91.05170	200.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
91.05171	200.	300.	PCI/L	0.0		6/25/91	UNDER CONTROL
91.05172	19.1	2.	NCI/L	22.	0.6	6/25/91	UNDER CONTROL
91.05521	19.7	2.	NCI/L	18.3	0.5	6/25/91	UNDER CONTROL
91.05522	1100.	400.	PCI/L	0.0		6/25/91	WARNING 2-3 SIG
91.05523	78.4	8.	NCI/L	91.6	2.4	6/25/91	UNDER CONTROL

REPORT NUMBER: 10678

DK for RJP	D Knal	[illegible]
Analyst	Section Leader	QA Officer
6-25-91	6-25-91	6/25/91
Date	Date	Date

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.

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Gamma Scan
and
Gross Gamma Analysis Data
for
Boreholes 1-5 and "B"

REPORT NUMBER: 10963

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: DK on 19-Jul-1991

ANALYSIS: GSCAN REQUEST NUMBER: 11620 MATRIX: SS ANALYST: George Brooks PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: G ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-1-S	91.05173	0.0			7/19/91	REQUESTCANCELED
AB-1-SQAQC	91.05174	0.0			7/19/91	REQUESTCANCELED
AB-1-5'	91.05175	0.0			7/19/91	REQUESTCANCELED
AB-1-10'	91.05176	0.0			7/19/91	REQUESTCANCELED
AB-1-15'	91.05177	0.0			7/19/91	REQUESTCANCELED
AB-1-20'	91.05178	0.0			7/19/91	REQUESTCANCELED
AB-1-25'	91.05179	0.0			7/19/91	REQUESTCANCELED
AB-1-30'	91.05180	0.0			7/19/91	REQUESTCANCELED
AB-1-35'	91.05181	0.0			7/19/91	REQUESTCANCELED
AB-1-40'	91.05182	0.0			7/19/91	REQUESTCANCELED
AB-1-45'	91.05183	0.0			7/19/91	REQUESTCANCELED
AB-1-50'	91.05184	0.0			7/19/91	REQUESTCANCELED
AB-1-BIT	91.05185	0.0			7/19/91	REQUESTCANCELED
AB-2-S	91.05186	0.0			7/19/91	REQUESTCANCELED
AB-2-5'	91.05187	0.0			7/19/91	REQUESTCANCELED
AB-2-10'	91.05188	0.0			7/19/91	REQUESTCANCELED
AB-2-15'	91.05189	0.0			7/19/91	REQUESTCANCELED
AB-2-20'	91.05190	0.0			7/19/91	REQUESTCANCELED
AB-2-25'	91.05191	0.0			7/19/91	REQUESTCANCELED
AB-2-30'	91.05192	0.0			7/19/91	REQUESTCANCELED
AB-2-35'	91.05193	0.0			7/19/91	REQUESTCANCELED
AB-2-40'	91.05194	0.0			7/19/91	REQUESTCANCELED
AB-2-45'	91.05195	0.0			7/19/91	REQUESTCANCELED
AB-2-50'	91.05196	0.0			7/19/91	REQUESTCANCELED
AB-2-BIT	91.05197	0.0			7/19/91	REQUESTCANCELED
AB-3-S	91.05198	0.0			7/19/91	REQUESTCANCELED
AB-3-5'	91.05199	0.0			7/19/91	REQUESTCANCELED
AB-3-10'	91.05200	0.0			7/19/91	REQUESTCANCELED
AB-3-15'	91.05201	0.0			7/19/91	REQUESTCANCELED
AB-3-20'	91.05202	0.0			7/19/91	REQUESTCANCELED
AB-3-25'	91.05203	0.0			7/19/91	REQUESTCANCELED
AB-3-30'	91.05204	0.0			7/19/91	REQUESTCANCELED
AB-3-35'	91.05205	0.0			7/19/91	REQUESTCANCELED
AB-3-40'	91.05206	0.0			7/19/91	REQUESTCANCELED
AB-3-45'	91.05207	0.0			7/19/91	REQUESTCANCELED
AB-3-50'	91.05208	0.0			7/19/91	REQUESTCANCELED
AB-3-BIT	91.05209	0.0			7/19/91	REQUESTCANCELED

AB-4-S	91.05210	0.0	7/19/91	REQUESTCANCELED
AB-4-5'	91.05211	0.0	7/19/91	REQUESTCANCELED
AB-4-10'	91.05212	0.0	7/19/91	REQUESTCANCELED
AB-4-15'	91.05219	0.0	7/19/91	REQUESTCANCELED
AB-4-20'	91.05220	0.0	7/19/91	REQUESTCANCELED
AB-4-25'	91.05221	0.0	7/19/91	REQUESTCANCELED
AB-4-30'	91.05222	0.0	7/19/91	REQUESTCANCELED
AB-4-35'	91.05223	0.0	7/19/91	REQUESTCANCELED
AB-4-40'	91.05224	0.0	7/19/91	REQUESTCANCELED
AB-4-45'	91.05225	0.0	7/19/91	REQUESTCANCELED
AB-4-50'	91.05226	0.0	7/19/91	REQUESTCANCELED
AB-4-BIT	91.05227	0.0	7/19/91	REQUESTCANCELED

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The GSCAN DATA from RN 11640 showed nothing but normal background peaks so GSCAN was canceled for the remainder of the samples.

REPORT NUMBER: 10963 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: DK on 19-Jul-1991

REQUEST NUMBER: 11620 MATRIX: SS ANALYST: George Brooks PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only 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 HSE-9

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

The following analyst QC's have no CV data for comparison

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
00.99750	91.05169	0.0			7/19/91	NO DATA AVAIL.
00.22545	91.05170	0.0			7/19/91	NO DATA AVAIL.
00.22545	91.05171	0.0			7/19/91	NO DATA AVAIL.
00.21975	91.05172	0.0			7/19/91	NO DATA AVAIL.

REPORT NUMBER: 10963

Analyst	Section Leader	QA Officer
7/22/91	7-19-91	
Date	Date	Date

REPORT NUMBER: 10964

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: DK on 19-Jul-1991

ANALYSIS: GSCAN REQUEST NUMBER: 11640 MATRIX: SS ANALYST: George Brooks PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: G ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-5-S	91.05491	0.0			7/19/91	COMPLETED
AB-5-5'	91.05492	0.0			7/19/91	COMPLETED
AB-5-10'	91.05493	0.0			7/19/91	COMPLETED
AB-5-15'	91.05494	0.0			7/19/91	COMPLETED
AB-5-20'	91.05495	0.0			7/19/91	COMPLETED
AB-5-25'	91.05496	0.0			7/19/91	COMPLETED
AB-5-30'	91.05497	0.0			7/19/91	COMPLETED
AB-5-35'	91.05498	0.0			7/19/91	COMPLETED
AB-5-40'	91.05499	0.0			7/19/91	COMPLETED
AB-5-45'	91.05500	0.0			7/19/91	COMPLETED
AB-5-50'	91.05501	0.0			7/19/91	COMPLETED
AB-5-BIT	91.05502	0.0			7/19/91	COMPLETED
AB-5-60'	91.05503	0.0			7/19/91	COMPLETED
AB-5-70'	91.05504	0.0			7/19/91	COMPLETED
AB-5-80'	91.05505	0.0			7/19/91	COMPLETED
AB-5-90'	91.05506	0.0			7/19/91	COMPLETED
AB-5-100'	91.05507	0.0			7/19/91	COMPLETED
AB-B-S	91.05508	0.0			7/19/91	COMPLETED
AB-B-S-QA/QC	91.05509	0.0			7/19/91	COMPLETED
AB-B-5'	91.05510	0.0			7/19/91	COMPLETED
AB-B-10'	91.05511	0.0			7/19/91	COMPLETED
AB-B-15'	91.05512	0.0			7/19/91	COMPLETED
AB-B-20'	91.05513	0.0			7/19/91	COMPLETED
AB-B-25'	91.05514	0.0			7/19/91	COMPLETED
AB-B-30'	91.05515	0.0			7/19/91	COMPLETED
AB-B-35'	91.05516	0.0			7/19/91	COMPLETED
AB-B-40'	91.05517	0.0			7/19/91	COMPLETED
AB-B-45'	91.05518	0.0			7/19/91	COMPLETED
AB-B-50'	91.05519	0.0			7/19/91	COMPLETED
AB-B-BIT	91.05520	0.0			7/19/91	COMPLETED

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REPORT NUMBER: 10964 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: DK on 19-Jul-1991

REQUEST NUMBER: 11640 MATRIX: SS ANALYST: George Brooks PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only 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 HSE-9

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 HSE-9

REPORT NUMBER: 10964

GB	D Knal	
Analyst	Section Leader	QA Officer
7/22/91	7-19-91	
Date	Date	Date

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

REPORT NUMBER: 10961

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: DK on 19-Jul-1991

ANALYSIS: GAMMA REQUEST NUMBER: 11620 MATRIX: SS ANALYST: George Brooks PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: G ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-1-S	91.05173	9.	1.	PCI/G	7/19/91	
AB-1-SQAQC	91.05174	9.	1.	PCI/G	7/19/91	
AB-1-5'	91.05175	8.	1.	PCI/G	7/19/91	
AB-1-10'	91.05176	9.	1.	PCI/G	7/19/91	
AB-1-15'	91.05177	9.	1.	PCI/G	7/19/91	
AB-1-20'	91.05178	10.	1.	PCI/G	7/19/91	
AB-1-25'	91.05179	9.	1.	PCI/G	7/19/91	
AB-1-30'	91.05180	11.	1.	PCI/G	7/19/91	
AB-1-35'	91.05181	9.	1.	PCI/G	7/19/91	
AB-1-40'	91.05182	10.	1.	PCI/G	7/19/91	
AB-1-45'	91.05183	11.	1.	PCI/G	7/19/91	
AB-1-50'	91.05184	9.	1.	PCI/G	7/19/91	
AB-1-BIT	91.05185	4.	1.	PCI/G	7/19/91	
AB-2-S	91.05186	4.	1.	PCI/G	7/19/91	
AB-2-5'	91.05187	4.	1.	PCI/G	7/19/91	
AB-2-10'	91.05188	7.	1.	PCI/G	7/19/91	
AB-2-15'	91.05189	8.	1.	PCI/G	7/19/91	
AB-2-20'	91.05190	9.	1.	PCI/G	7/19/91	
AB-2-25'	91.05191	8.	1.	PCI/G	7/19/91	
AB-2-30'	91.05192	8.	1.	PCI/G	7/19/91	
AB-2-35'	91.05193	9.	1.	PCI/G	7/19/91	
AB-2-40'	91.05194	9.	1.	PCI/G	7/19/91	
AB-2-45'	91.05195	9.	1.	PCI/G	7/19/91	
AB-2-50'	91.05196	9.	1.	PCI/G	7/19/91	
AB-2-BIT	91.05197	8.	1.	PCI/G	7/19/91	
AB-3-S	91.05198	6.	1.	PCI/G	7/19/91	
AB-3-5'	91.05199	6.	1.	PCI/G	7/19/91	
AB-3-10'	91.05200	7.	1.	PCI/G	7/19/91	
AB-3-15'	91.05201	8.	1.	PCI/G	7/19/91	
AB-3-20'	91.05202	8.	1.	PCI/G	7/19/91	
AB-3-25'	91.05203	8.	1.	PCI/G	7/19/91	
AB-3-30'	91.05204	6.	1.	PCI/G	7/19/91	
AB-3-35'	91.05205	9.	1.	PCI/G	7/19/91	
AB-3-40'	91.05206	7.	1.	PCI/G	7/19/91	
AB-3-45'	91.05207	8.	1.	PCI/G	7/19/91	
AB-3-50'	91.05208	9.	1.	PCI/G	7/19/91	
AB-3-BIT	91.05209	9.	1.	PCI/G	7/19/91	

AB-4-S	91.05210	6.	1.	PCI/G	7/19/91
AB-4-5'	91.05211	6.	1.	PCI/G	7/19/91
AB-4-10'	91.05212	8.	1.	PCI/G	7/19/91
AB-4-15'	91.05219	8.	1.	PCI/G	7/19/91
AB-4-20'	91.05220	8.	1.	PCI/G	7/19/91
AB-4-25'	91.05221	8.	1.	PCI/G	7/19/91
AB-4-30'	91.05222	9.	1.	PCI/G	7/19/91
AB-4-35'	91.05223	10.	1.	PCI/G	7/19/91
AB-4-40'	91.05224	8.	1.	PCI/G	7/19/91
AB-4-45'	91.05225	10.	1.	PCI/G	7/19/91
AB-4-50'	91.05226	11.	1.	PCI/G	7/19/91
AB-4-BIT	91.05227	10.	1.	PCI/G	7/19/91

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REPORT NUMBER: 10961 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: DK on 19-Jul-1991

REQUEST NUMBER: 11620 MATRIX: SS ANALYST: George Brooks PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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
00.00761	190.	20.	PCI/G	219.	11.	7/19/91	UNDER CONTROL
00.00761	200.	20.	PCI/G	219.	11.	7/19/91	UNDER CONTROL
00.00761	190.	20.	PCI/G	219.	11.	7/19/91	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

X 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 HSE-9

REPORT NUMBER: 10961

Analyst	Section Leader	QA Officer
7/22/91	7-17-91	
Date	Date	Date

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.

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REPORT NUMBER: 10962

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: DK on 19-Jul-1991

ANALYSIS: GAMMA REQUEST NUMBER: 11640 MATRIX: SS ANALYST: George Brooks PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: G ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-5-S	91.05491	35.	4.	PCI/G	7/19/91	
AB-5-5'	91.05492	9.	1.	PCI/G	7/19/91	
AB-5-10'	91.05493	7.	1.	PCI/G	7/19/91	
AB-5-15'	91.05494	9.	1.	PCI/G	7/19/91	
AB-5-20'	91.05495	9.	1.	PCI/G	7/19/91	
AB-5-25'	91.05496	48.	5.	PCI/G	7/19/91	
AB-5-30'	91.05497	9.	1.	PCI/G	7/19/91	
AB-5-35'	91.05498	8.	1.	PCI/G	7/19/91	
AB-5-40'	91.05499	8.	1.	PCI/G	7/19/91	
AB-5-45'	91.05500	9.	1.	PCI/G	7/19/91	
AB-5-50'	91.05501	8.	1.	PCI/G	7/19/91	
AB-5-BIT	91.05502	7.	1.	PCI/G	7/19/91	
AB-5-60'	91.05503	7.	1.	PCI/G	7/19/91	
AB-5-70'	91.05504	6.	1.	PCI/G	7/19/91	
AB-5-80'	91.05505	7.	1.	PCI/G	7/19/91	
AB-5-90'	91.05506	8.	1.	PCI/G	7/19/91	
AB-5-100'	91.05507	11.	1.	PCI/G	7/19/91	

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REPORT NUMBER: 10962 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: DK on 19-Jul-1991

REQUEST NUMBER: 11640 MATRIX: SS ANALYST: George Brooks PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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
00.00761	200.	20.	PCI/G	219.	11.	7/19/91	UNDER CONTROL
00.00761	190.	20.	PCI/G	219.	11.	7/19/91	UNDER CONTROL
00.00761	190.	20.	PCI/G	219.	11.	7/19/91	UNDER CONTROL
00.00761	190.	20.	PCI/G	219.	11.	7/19/91	UNDER CONTROL
00.00761	200.	20.	PCI/G	219.	11.	7/19/91	UNDER CONTROL
00.00761	190.	20.	PCI/G	219.	11.	7/19/91	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

X 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 HSE-9

REPORT NUMBER: 10962

Analyst	Section Leader	QA Officer
7/22/91	7-17-91	
Date	Date	Date

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.

Gravimetric Moisture Analysis Data
for
Boreholes 1-5 and "B"
(Grab Samples)

REPORT NUMBER: 10934

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: ESG on 17-Jul-1991

ANALYSIS: H2O- REQUEST NUMBER: 11620 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-1-S	91.05173	2.95	0.3	%	7/09/91	
AB-1-SQAQC	91.05174	2.45	0.25	%	7/09/91	
AB-1-5'	91.05175	8.8	0.88	%	7/09/91	
AB-1-10'	91.05176	2.2	0.22	%	7/09/91	
AB-1-15'	91.05177	2.63	0.26	%	7/09/91	
AB-1-20'	91.05178	2.64	0.26	%	7/09/91	
AB-1-25'	91.05179	2.69	0.27	%	7/09/91	
AB-1-30'	91.05180	2.75	0.27	%	7/09/91	
AB-1-35'	91.05181	2.52	0.25	%	7/09/91	
AB-1-40'	91.05182	2.4	0.24	%	7/09/91	
AB-1-45'	91.05183	2.7	0.27	%	7/09/91	
AB-1-50'	91.05184	2.65	0.27	%	7/09/91	
AB-1-BIT	91.05185	2.56	0.26	%	7/09/91	
AB-2-S	91.05186	3.19	0.31	%	7/09/91	
AB-2-5'	91.05187	3.8	0.38	%	7/09/91	
AB-2-10'	91.05188	12.56	1.3	%	7/09/91	
AB-2-15'	91.05189	7.38	0.74	%	7/09/91	
AB-2-20'	91.05190	7.65	0.76	%	7/09/91	
AB-2-25'	91.05191	6.81	0.68	%	7/09/91	
AB-2-30'	91.05192	6.28	0.63	%	7/09/91	
AB-2-35'	91.05193	5.95	0.6	%	7/09/91	
AB-2-40'	91.05194	9.82	0.98	%	7/09/91	
AB-2-45'	91.05195	6.18	0.61	%	7/09/91	
AB-2-50'	91.05196	6.25	0.62	%	7/09/91	
AB-2-BIT	91.05197	11.61	1.1	%	7/09/91	
AB-3-S	91.05198	3.53	0.35	%	7/09/91	
AB-3-5'	91.05199	20.76	2.1	%	7/09/91	
AB-3-10'	91.05200	8.68	0.87	%	7/09/91	
AB-3-15'	91.05201	16.43	1.6	%	7/09/91	
AB-3-20'	91.05202	8.35	0.83	%	7/09/91	
AB-3-25'	91.05203	6.87	0.69	%	7/09/91	
AB-3-30'	91.05204	9.71	0.97	%	7/09/91	
AB-3-35'	91.05205	6.12	0.61	%	7/09/91	
AB-3-40'	91.05206	3.16	0.32	%	7/09/91	
AB-3-45'	91.05207	6.36	0.64	%	7/09/91	
AB-3-50'	91.05208	3.84	0.38	%	7/09/91	
AB-3-BIT	91.05209	4.13	0.41	%	7/09/91	
AB-4-S	91.05210	3.72	0.37	%	7/09/91	
AB-4-5'	91.05211	10.96	1.1	%	7/09/91	
AB-4-10'	91.05212	6.22	0.62	%	7/09/91	
AB-4-15'	91.05219	9.03	0.9	%	7/09/91	
AB-4-20'	91.05220	8.05	0.8	%	7/09/91	
AB-4-25'	91.05221	7.76	0.78	%	7/09/91	
AB-4-30'	91.05222	3.11	0.31	%	7/09/91	
AB-4-35'	91.05223	5.5	0.55	%	7/09/91	
AB-4-40'	91.05224	4.46	0.45	%	7/09/91	
AB-4-45'	91.05225	1.87	0.19	%	7/09/91	
AB-4-50'	91.05226	0.8	0.08	%	7/09/91	
AB-4-BIT	91.05227	3.	0.3	%	7/09/91	

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-4-30'	91.05222	6.32	0.63	%	7/09/91	

AB-4-45'	91.05225	2.99	0.3	%	7/09/91
AB-4-50'	91.05226	3.07	0.31	%	7/09/91

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REPORT NUMBER: 10934 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: ESG on 17-Jul-1991

REQUEST NUMBER: 11620 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only 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 HSE-9

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
91.05169	4.24	0.42	%	4.76	0.5	7/09/91	UNDER CONTROL
91.05172	3.96	0.4	%	4.76	0.4	7/09/91	UNDER CONTROL
91.05170	3.96	0.4	%	4.74	0.4	7/09/91	UNDER CONTROL
91.05171	3.98	0.4	%	4.74	0.4	7/09/91	UNDER CONTROL

REPORT NUMBER: 10934

RJP	D Kent C	mag
Analyst	Section Leader	QA Officer
17 Jul 91	7-18-91	7-19-91
Date	Date	Date

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.

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REPORT NUMBER: 10938

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: ESG on 18-Jul-1991

ANALYSIS: H2O- REQUEST NUMBER: 11640 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-5-S	91.05491	8.25	0.83	%	7/09/91	
AB-5-5'	91.05492	8.96	0.9	%	7/09/91	
AB-5-10'	91.05493	4.35	0.44	%	7/09/91	
AB-5-15'	91.05494	2.48	0.25	%	7/09/91	
AB-5-20'	91.05495	6.9	0.69	%	7/09/91	
AB-5-25'	91.05496	7.38	0.74	%	7/09/91	
AB-5-30'	91.05497	7.29	0.73	%	7/09/91	
AB-5-35'	91.05498	6.52	0.65	%	7/09/91	
AB-5-40'	91.05499	0.99	0.09	%	7/09/91	
AB-5-45'	91.05500	5.58	0.56	%	7/09/91	
AB-5-50'	91.05501	6.4	0.64	%	7/09/91	
AB-5-BIT	91.05502	7.3	0.73	%	7/09/91	
AB-5-60'	91.05503	6.37	0.63	%	7/09/91	
AB-5-70'	91.05504	3.38	0.34	%	7/09/91	
AB-5-80'	91.05505	2.01	0.2	%	7/09/91	
AB-5-90'	91.05506	6.49	0.65	%	7/09/91	
AB-5-100'	91.05507	6.95	0.69	%	7/09/91	
AB-B-S	91.05508	12.69	1.3	%	7/09/91	
AB-B-S-QA/QC	91.05509	7.57	0.76	%	7/09/91	
AB-B-5'	91.05510	9.84	0.98	%	7/09/91	
AB-B-10'	91.05511	1.92	0.19	%	7/09/91	
AB-B-15'	91.05512	0.93	0.09	%	7/09/91	
AB-B-20'	91.05513	1.65	0.17	%	7/09/91	
AB-B-25'	91.05514	2.63	0.26	%	7/09/91	
AB-B-30'	91.05515	1.98	0.2	%	7/09/91	
AB-B-35'	91.05516	1.73	0.17	%	7/09/91	
AB-B-40'	91.05517	1.66	0.17	%	7/09/91	
AB-B-45'	91.05518	2.22	0.22	%	7/09/91	
AB-B-50'	91.05519	2.72	0.27	%	7/09/91	
AB-B-BIT	91.05520	0.85	0.08	%	7/09/91	

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-5-10'	91.05493	7.7	0.77	%	7/09/91	We ran 2C reps
AB-5-15'	91.05494	5.8	0.58	%	7/09/91	
AB-5-40'	91.05499	6.46	0.65	%	7/09/91	All others agreed
AB-5-70'	91.05504	6.16	0.62	%	7/09/91	
AB-5-80'	91.05505	6.44	0.64	%	7/09/91	with the 1st anly.
AB-B-S-QA/QC	91.05509	9.25	0.93	%	7/09/91	

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REPORT NUMBER: 10938 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: ESG on 18-Jul-1991

REQUEST NUMBER: 11640 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only 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 HSE-9

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
91.05521	4.47	0.45	%	4.76	0.4	7/09/91	UNDER CONTROL
91.05522	2.71	0.27	%	2.91	0.26	7/09/91	UNDER CONTROL
91.05523	3.34	0.33	%	3.85	0.3	7/09/91	UNDER CONTROL

REPORT NUMBER: 10938

RJP
Analyst

Section Leader

mag
QA Officer

19 July 91
Date

7-19-91
Date

7-19-91
Date

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.

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Tritium Analysis Data
for
Borehole 6

REPORT NUMBER: 10953

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: DK on 19-Jul-1991

ANALYSIS: H-3 REQUEST NUMBER: 11698 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-6-5'	91.06217	15600.	1000.	PCI/L	7/15/91	
AB-6-10'	91.06218	44500.	3000.	PCI/L	7/15/91	
AB-6-15'	91.06219	36500.	3000.	PCI/L	7/15/91	
AB-6-20'	91.06220	23500.	2000.	PCI/L	7/15/91	
AB-6-25'	91.06221	16700.	1000.	PCI/L	7/15/91	
AB-6-30'	91.06222	9100.	900.	PCI/L	7/15/91	
AB-6-40'	91.06223	4400.	400.	PCI/L	7/15/91	
AB-6-50'	91.06224	900.	300.	PCI/L	7/15/91	
AB-6-70'	91.06226	500.	300.	PCI/L	7/19/91	
AB-6-80'	91.06227	400.	300.	PCI/L	7/15/91	
AB-6-90'	91.06228	300.	300.	PCI/L	7/15/91	
AB-6-100'	91.06229	0.0	300.	PCI/L	7/15/91	
AB-6-110'	91.06230	200.	300.	PCI/L	7/15/91	
AB-6-140'	91.06233	0.0	300.	PCI/L	7/15/91	
AB-6-150'	91.06234	200.	300.	PCI/L	7/15/91	
AB-6-25'QA	91.06240	10300.	1000.	PCI/L	7/15/91	

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REPORT NUMBER: 10953 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: DK on 19-Jul-1991

REQUEST NUMBER: 11698 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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
00.22385	500.	300.	PCI/L	0.0		7/19/91	UNDER CONTROL
00.22385	300.	300.	PCI/L	0.0		7/15/91	UNDER CONTROL
00.22385	100.	400.	PCI/L	0.0		7/15/91	UNDER CONTROL
00.22386	16300.	1000.	PCI/L	18430.	370.	7/15/91	UNDER CONTROL
00.22386	16000.	400.	PCI/L	18430.	370.	7/15/91	OUT OF CONTROL
00.22386	16000.	1000.	PCI/L	18430.	370.	7/19/91	WARNING 2-3 SIG

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
91.06389	297.	20.	NCI/L	356.	9.	7/15/91	WARNING 2-3 SIG
91.06390	77.4	5.	NCI/L	89.1	2.3	7/15/91	WARNING 2-3 SIG
91.06592	4.	0.4	NCI/L	3.56	0.09	7/19/91	UNDER CONTROL

REPORT NUMBER: 10953

Analyst	Section Leader	QA Officer
RJP	GB	
19 Jul 91	7/22/91	
Date	Date	Date

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.

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Gravimetric Moisture Analysis Data
for
Borehole 6

REPORT NUMBER: 10922

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: B BATES on 17-Jul-1991

ANALYSIS: H2O- REQUEST NUMBER: 11698 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-6-5'	91.06217	8.35	0.84	%	7/16/91	
AB-6-10'	91.06218	6.98	0.7	%	7/16/91	
AB-6-15'	91.06219	4.94	0.49	%	7/16/91	
AB-6-20'	91.06220	6.61	0.66	%	7/16/91	
AB-6-25'	91.06221	6.34	0.63	%	7/16/91	
AB-6-30'	91.06222	5.48	0.55	%	7/16/91	
AB-6-40'	91.06223	5.87	0.59	%	7/16/91	
AB-6-50'	91.06224	6.54	0.65	%	7/16/91	
AB-6-70'	91.06226	15.	1.5	%	7/16/91	
AB-6-80'	91.06227	5.79	0.58	%	7/16/91	
AB-6-90'	91.06228 *	20.	27.	%	7/16/91	RANGE-NOT ERROR
AB-6-100'	91.06229	7.45	0.75	%	7/17/91	
AB-6-110'	91.06230	8.04	0.8	%	7/17/91	
AB-6-140'	91.06233	13.13	1.3	%	7/17/91	
AB-6-150'	91.06234	14.42	1.4	%	7/17/91	
AB-6-25'QA	91.06240	6.96	0.7	%	7/16/91	

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REPORT NUMBER: 10922 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: B BATES on 17-Jul-1991

REQUEST NUMBER: 11698 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only 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 HSE-9

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
91.06389	4.59	0.46	%	4.76	0.4	7/16/91	UNDER CONTROL
91.06390	4.58	0.46	%	4.76	0.4	7/16/91	UNDER CONTROL

REPORT NUMBER: 10922

RJP	ibb	
Analyst	Section Leader	QA Officer
18 Jul 91	7/22/91	
Date	Date	Date

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.

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Metals Analysis Data
for
Borehole 6

REPORT NUMBER: 10966

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: BHEMBERGER on 22-Jul-1991

ANALYSIS: AG REQUEST NUMBER: 11697 MATRIX: SS ANALYST: Barbara Hemberger PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: FAA ANALYTICAL PROCEDURE: 200.2

CUSTOMER

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-6-20'	91.06220	< 1.		UG/G	7/22/91	
AB-6-100'	91.06229	< 1.		UG/G	7/22/91	

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-6-100'	91.06229	< 1.		UG/G	7/22/91	

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REPORT NUMBER: 10966 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: BHEMBERGER on 22-Jul-1991

REQUEST NUMBER: 11697 MATRIX: SS ANALYST: Barbara Hemberger PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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
00.01160	33.	3.	UG/L	32.	2.45	7/22/91	UNDER CONTROL
00.98805	0.501	0.05	MG/L	0.5	0.05	7/22/91	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
91.06392	241.	24.	UG/L	250.	25.	7/22/91	UNDER CONTROL

REPORT NUMBER: 10966

Analyst	Section Leader	QA Officer
7/22/91	7/22/91	7/22/91
Date	Date	Date

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.

****

REPORT NUMBER: 10959

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: MAB on 19-Jul-1991

ANALYSIS: HG REQUEST NUMBER: 11697 MATRIX: SS ANALYST: Malti Bhatia PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: CVAA ANALYTICAL PROCEDURE: 7470

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-6-20'	91.06220	< 25.		NG/G	7/19/91	
AB-6-100'	91.06229	< 25.		NG/G	7/19/91	

CUSTOMER SAMPLE DUPLICATES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-6-20'	91.06220	< 25.		NG/G	7/19/91	
AB-6-100'	91.06229	< 25.		NG/G	7/19/91	

MATRIX SPIKES:

CUSTOMER NUM	SAMPLE NUM	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT
AB-6-20'	91.06220	1.	0.9	UG/L	7/19/91	
AB-6-100'	91.06229	1.	0.9	UG/L	7/19/91	

****

REPORT NUMBER: 10959 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: MAB on 19-Jul-1991

REQUEST NUMBER: 11697 MATRIX: SS ANALYST: Malti Bhatia PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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
00.20087	4.	0.4	UG/L	4.	0.4	7/19/91	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
91.06391	0.9	0.2	UG/L	1.	0.06	7/19/91	UNDER CONTROL

REPORT NUMBER: 10959

MAB
Analyst

7/19/91
Date

Section Leader

7/19/91
Date

QA Officer

7/19/91
Date

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.

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REPORT NUMBER: 10983

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 23-Jul-1991

REQUEST NUMBER: 11697 MATRIX: SS ANALYST: Janet Montoya PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: ICPES ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-6-20'	91.06220	AS	< 4.3		UG/G	7/23/91	
AB-6-20'	91.06220	BA	61.	12.	UG/G	7/23/91	
AB-6-20'	91.06220	CD	< 0.3		UG/G	7/23/91	
AB-6-20'	91.06220	CR	3.	0.4	UG/G	7/23/91	
AB-6-20'	91.06220	PB	13.	12.	UG/G	7/23/91	
AB-6-20'	91.06220	SE	< 3.8		UG/G	7/23/91	
AB-6-100'	91.06229	AS	< 4.3		UG/G	7/23/91	
AB-6-100'	91.06229	BA	28.	5.6	UG/G	7/23/91	
AB-6-100'	91.06229	CD	< 0.3		UG/G	7/23/91	
AB-6-100'	91.06229	CR	0.4	1.4	UG/G	7/23/91	
AB-6-100'	91.06229	PB	20.	12.	UG/G	7/23/91	
AB-6-100'	91.06229	SE	< 3.8		UG/G	7/23/91	

****

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: EAJ on 23-Jul-1991

REQUEST NUMBER: 11697 MATRIX: SS ANALYST: Janet Montoya PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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
00.22757	AS	15.	1.5	MG/L	15.	1.5	7/23/91	UNDER CONTROL
00.22757	AS	15.	1.5	MG/L	15.	1.5	7/23/91	UNDER CONTROL
00.22757	BA	2.4	0.2	MG/L	2.5	0.25	7/23/91	UNDER CONTROL
00.22757	BA	2.4	0.2	MG/L	2.5	0.25	7/23/91	UNDER CONTROL
00.22757	CD	1.5	0.2	MG/L	1.5	0.15	7/23/91	UNDER CONTROL
00.22757	CD	1.6	0.2	MG/L	1.5	0.15	7/23/91	UNDER CONTROL
00.22757	CR	3.1	0.3	MG/L	3.	0.3	7/23/91	UNDER CONTROL
00.22757	CR	3.2	0.3	MG/L	3.	0.3	7/23/91	UNDER CONTROL
00.22757	PB	10.	1.	MG/L	10.	1.	7/23/91	UNDER CONTROL
00.22757	PB	11.	1.1	MG/L	10.	1.	7/23/91	UNDER CONTROL
00.22757	SE	15.	1.5	MG/L	15.	1.5	7/23/91	UNDER CONTROL
00.22757	SE	14.	1.4	MG/L	15.	1.5	7/23/91	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
91.06392	AS	21.	2.1	MG/L	20.	2.	7/23/91	UNDER CONTROL
91.06392	BA	< 16.		MG/L	0.0		7/23/91	UNDER CONTROL
91.06392	CD	3.2	0.3	MG/L	3.	0.3	7/23/91	UNDER CONTROL
91.06392	CR	6.2	0.6	MG/L	6.	0.6	7/23/91	UNDER CONTROL
91.06392	PB	10.	1.	MG/L	10.	1.	7/23/91	UNDER CONTROL
91.06392	SE	2.	0.2	MG/L	2.	0.2	7/23/91	UNDER CONTROL

Analyst Section Leader QA Officer

Date Date Date

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.

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Volatile Organic Analysis Data
for
Borehole 6

JULY 16, 1991

TO: ALICE BARR
THRU: CHRIS LEIBMAN
FROM: LAURA TSIAGKOURIS
REQUEST: 11696

The following soil samples were analyzed for Volatile Organic Components (VOC's) using a SW 846 Purge & Trap (P/T) GC/MS method 8260 of analysis:

91.06217	91.06218	91.06219	91.06220
91.06221	91.06222	91.06223	91.06224
91.06227	91.06229	91.06230	91.06233
91.06234	91.06240	91.06393	

A 4 - 6 gram sample aliquot was analyzed. Final results are reported on a wet weight bases. Since the final results are not blank subtracted, the results from the associated method blanks (samples 91.06396 - 91.06398) have been included in the report. **The 14 day holding time for soil samples was met.** It should be noted that a small amount of liquid was in the plastic bag containing the sampling core for samples 91.0218, 91.06223, and sample 91.06227. The sample itself was wet. It is not clear if the liquid in the bag came from the sample, or if the liquid came from ice or condensation as a result of the storage of the samples.

RESULTS:

SAMPLE ID	TARGET COMPOUNDS DETECTED	AMOUNT (ug/kg)	LOQ (ug/kg)
91.06217	NONE	--	--
91.06218	NONE	--	5.0
91.06219	NONE	--	5.0
91.06220	NONE	--	--
91.06221	NONE	--	5.0
91.06223	NONE	--	5.0
91.06224	NONE	--	--
91.06227	NONE	--	5.0
91.06229	Methylene chloride *	77	5.0
91.06230	NONE	--	5.0
91.06233	NONE	--	--
91.06234	Methylene chloride *	72	5.0
91.06240	NONE	--	5.0
91.06393 (TRIP BLANK)	NONE	--	5.0

* - Flagged compound is a result of contamination occurring in the sample storage refrigerator. A vial containing distilled water was place in the sample refrigerator. A 5 mL aliquot was analyzed 5 hours later. Methylene chloride was detected in the water and the results are reported as sample **91.06438.**

It should be noted that the limit of quantitation (LOQ) for the majority of the volatile organic compounds (VOC's) is 5.0 ug/kg. The limit of quantitation for VOC's ranges from 5 - 100 ug/kg as indicated on the final report.

As indicated above, the analysis of samples 91.06217 - 91.06224, 91.06227, 91.06229, 91.06230, 91.06233, 91.06234, 91.06240, and 91.06393 did not detect any target and/or non-target volatile organic compounds at or above the limit of quantitation (LOQ) with the exception of methylene chloride in samples 91.06229 and 91.06234. As previously mention, the detection of methylene chloride is a result of contamination occurring in the sample refrigerator. It should be mentioned that sample 91.06234 had been previously analyzed qualitatively only resulting in the detection of no volatile organic compounds. The data could not be used since the proper tuning and calibrating procedure had not been implemented. Further indicating that the methylene chloride is a result of laboratory contamination and not as a result of actually being in the sample.

QC Summary for RS 11696

The recovery of the surrogate 1,2-dichloroethane-d4 for several samples were above the upper control limits.

Sample 91.06224 was used as the matrix spike media by adding 10 uL of the matrix spike mix to two separate 5 gram aliquots. The precision and accuracy for all spiked components were within the control limits for both spiked aliquots.

Samples 91.06394 and 91.06395 were received from the Quality Assurance section to be analyzed with this request group as a "blind" Q.C. sample. The results are included in the final report.

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY AND ENVIRONMENT DIVISION
HSE-9
SURROGATE RECOVERIES FOR VOLATILES
SOIL

REQUEST #: 11696

NUMBER OF SAMPLES: 22
MATRIX S
ANALYST: LAT
Date: 07/17/91

JT 7/17/91

SURROGATE RECOVERIES

SURROGATE
RECOVERIES IN PERCENT (%)

	SAMPLE NUMBERS	TYPE	d4-1,2-dichloro-ethene	toluene-(d8)	4-bromo-fluoro-benzene
1	b91.06396	BLANK	108	104	103
2	s91.06221	SAMPLE	114	101	102
3	s91.06222	SAMPLE	122 *	107	100
4	s91.06220	SAMPLE	122 *	102	105
5	s91.06240	SAMPLE	134 *	106	103
6	s91.06217	SAMPLE	123 *	105	105
7	s91.06219	SAMPLE	128 *	106	104
8	s91.06223	SAMPLE	120	107	109
9	s91.06224	SAMPLE	125 *	108	102
10	s91.06218	SAMPLE	125 *	106	105
11	m91.06224	MATRIX SPIK	142 *	107	105
12	d91.06224	MATRIX SP-D	135 *	109	100
13	s91.06395	SAMPLE	149 *	112	107
14	b91.06397	BLANK	101	103	99
15	s91.06393	SAMPLE	103	102	96
16	s91.06394	SAMPLE	122 *	106	97
17	s91.06227	SAMPLE	102	97	104
18	s91.06234	SAMPLE	111	102	102
19	s91.06233	SAMPLE	126 *	99	103
20	s91.06229	SAMPLE	125 *	105	102
21	b91.06398	BLANK	98	88	92
22	s91.06230	SAMPLE	93	87	88

Average % Surrogate Recovery...	122	105	104
Defined Lower QC Limits (%)....	70	81	74
Defined Upper QC Limits (%)....	121	117	121
Observed Lower QC Limits (%)...	108	101	100
Observed Upper QC Limits (%)...	134	108	109

"*" If % Surrogate Recovery is Followed by a "*", it is out of QC Limits.

Reviewed By:

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY AND ENVIRONMENT DIVISION
HSE-9
SURROGATE RECOVERIES FOR VOLATILES
SOIL

REQUEST #: 11696

NUMBER OF SAMPLES: 1
MATRIX S
ANALYST: LAT
Date: 07/17/91

JKT 7/17/91

SURROGATE RECOVERIES

SURROGATE
RECOVERIES IN PERCENT (%)

	SAMPLE NUMBERS	TYPE	d4-1,2-dichloroethene	toluene-(d8)	4-bromofluorobenzene
1	s91.06438	SAMPLE	108	101	117
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

Average % Surrogate Recovery...	108	101	117
Defined Lower QC Limits (%)....	70	81	74
Defined Upper QC Limits (%)....	121	117	121
Observed Lower QC Limits (%)...	108	101	117
Observed Upper QC Limits (%)...	108	101	117

"*" If % Surrogate Recovery is Followed by a "*", it is out of QC Limits.

Reviewed By:

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY AND ENVIRONMENT DIVISION
HSE-9
MATRIX SPIKE RECOVERIES FOR VOLATILES

		DRY WT/VOL (G or ML)		DILUTION FACTOR	AMOUNT SPIKED	LOQ (UG/KG OR UG/
REQUEST #:	11696					
NUMBER OF SAMPLES:	20					
SPIKE ID: (STARTS M OR E)	e91.06224	SPIKE	4.91	1	52	5
SPIKE DUP ID: (STARTS D OR F)	d91.06224	SPIKE-DUP	4.85	1	52	5
RAW DATA WITH:	---					
ANALYST:	LAT					

AL 7/17/91

	SPIKE REC.	SPIKE-DUP REC.	SPIKE % REC.	SPIKE-DUP % REC.	RPD	LOW. REC. LIM.	UPP. REC. LIM.	RPD LIM.
1,1-Dichlorethene	65	66	125%	128%	2%	59	172	22
Benzene	54	57	104%	111%	6%	66	142	21
Trichlorethene	57	58	110%	113%	3%	62	137	24
Toluene	53	54	102%	105%	3%	59	139	21
Chlorobenzene	51	53	98%	103%	5%	60	133	21

"*" If % Matrix Recovery is Followed by a "*", it is out of QC Limits.

Reviewed By:

REPORT N 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06217

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/12/91 Date Analyzed: 7/12/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-5'	91.06217	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-5'	91.06217	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-5'	91.06217	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-5'	91.06217	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-5'	91.06217	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-5'	91.06217	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-5'	91.06217	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-5'	91.06217	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-5'	91.06217	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-5'	91.06217	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-5'	91.06217	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-5'	91.06217	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-5'	91.06217	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-5'	91.06217	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-5'	91.06217	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-5'	91.06217	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-5'	91.06217	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-5'	91.06217	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-5'	91.06217	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-5'	91.06217	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-5'	91.06217	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-5'	1.06217	95498	< 5.	UG/KG	91	o-Chlorotoluene
AB-6-5'	91.06217	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-5'	91.06217	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-5'	91.06217	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-5'	91.06217	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-5'	91.06217	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-5'	91.06217	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-5'	91.06217	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-5'	91.06217	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-5'	91.06217	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-5'	91.06217	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-5'	91.06217	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-5'	91.06217	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-5'	91.06217	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-5'	91.06217	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-5'	91.06217	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-5'	91.06217	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-5'	91.06217	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-5'	91.06217	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-5'	91.06217	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-5'	91.06217	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-5'	91.06217	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-5'	91.06217	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-5'	91.06217	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-5'	91.06217	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-5'	91.06217	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-5'	91.06217	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-5'	91.06217	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-5'	91.06217	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-5'	91.06217	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-5'	91.06217	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-5'	91.06217	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-5'	91.06217	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-5'	91.06217	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-5'	91.06217	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-5'	91.06217	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-5'	91.06217	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-5'	91.06217	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-5'	91.06217	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-5'	91.06217	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-5'	91.06217	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-5'	91.06217	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-5'	91.06217	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-5'	91.06217	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06217

none

Customer Sample Duplicate Results for Sample # 91.06217

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06217

none

REPORT NO . 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06218

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/12/91 Date Analyzed: 7/12/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-10'	91.06218	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-10'	91.06218	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-10'	91.06218	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-10'	91.06218	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-10'	91.06218	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-10'	91.06218	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-10'	91.06218	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-10'	91.06218	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-10'	91.06218	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-10'	91.06218	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-10'	91.06218	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-10'	91.06218	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-10'	91.06218	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-10'	91.06218	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-10'	91.06218	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-10'	91.06218	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-10'	91.06218	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-10'	91.06218	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-10'	91.06218	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-10'	91.06218	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-10'	91.06218	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-10'	.06218	95498	< 5.	UG/KG	1	o-Chlorotoluene
AB-6-10'	91.06218	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-10'	91.06218	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-10'	91.06218	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-10'	91.06218	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-10'	91.06218	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-10'	91.06218	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-10'	91.06218	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-10'	91.06218	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-10'	91.06218	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-10'	91.06218	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-10'	91.06218	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-10'	91.06218	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-10'	91.06218	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-10'	91.06218	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-10'	91.06218	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-10'	91.06218	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-10'	91.06218	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-10'	91.06218	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-10'	91.06218	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-10'	91.06218	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-10'	91.06218	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-10'	91.06218	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-10'	91.06218	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-10'	91.06218	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-10'	91.06218	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-10'	91.06218	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-10'	91.06218	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-10'	91.06218	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-10'	91.06218	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-10'	91.06218	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-10'	91.06218	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-10'	91.06218	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-10'	91.06218	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-10'	91.06218	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-10'	91.06218	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-10'	91.06218	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-10'	91.06218	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-10'	91.06218	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-10'	91.06218	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-10'	91.06218	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-10'	91.06218	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-10'	91.06218	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-10'	91.06218	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06218

none

Customer Sample Duplicate Results for Sample # 91.06218

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06218

none

REPORT NO : 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06219

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/12/91 Date Analyzed: 7/12/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-15'	91.06219	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-15'	91.06219	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-15'	91.06219	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-15'	91.06219	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-15'	91.06219	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-15'	91.06219	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-15'	91.06219	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-15'	91.06219	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-15'	91.06219	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-15'	91.06219	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-15'	91.06219	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-15'	91.06219	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-15'	91.06219	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-15'	91.06219	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-15'	91.06219	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-15'	91.06219	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-15'	91.06219	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-15'	91.06219	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-15'	91.06219	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-15'	91.06219	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-15'	91.06219	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-15'	[illegible].06219	95498	< 5.	UG/KG	[illegible]1	o-Chlorotoluene
AB-6-15'	91.06219	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-15'	91.06219	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-15'	91.06219	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-15'	91.06219	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-15'	91.06219	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-15'	91.06219	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-15'	91.06219	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-15'	91.06219	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-15'	91.06219	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-15'	91.06219	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-15'	91.06219	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-15'	91.06219	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-15'	91.06219	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-15'	91.06219	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-15'	91.06219	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-15'	91.06219	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-15'	91.06219	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-15'	91.06219	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-15'	91.06219	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-15'	91.06219	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-15'	91.06219	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-15'	91.06219	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-15'	91.06219	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-15'	91.06219	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-15'	91.06219	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-15'	91.06219	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-15'	91.06219	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-15'	91.06219	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-15'	91.06219	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-15'	91.06219	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-15'	91.06219	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-15'	91.06219	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-15'	91.06219	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-15'	91.06219	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-15'	91.06219	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-15'	91.06219	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-15'	91.06219	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-15'	91.06219	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-15'	91.06219	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-15'	91.06219	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-15'	91.06219	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-15'	91.06219	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-15'	91.06219	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06219

none

Customer Sample Duplicate Results for Sample # 91.06219

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06219

none

REPORT NUM 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06220

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/12/91 Date Analyzed: 7/12/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-20'	91.06220	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-20'	91.06220	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-20'	91.06220	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-20'	91.06220	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-20'	91.06220	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-20'	91.06220	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-20'	91.06220	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-20'	91.06220	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-20'	91.06220	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-20'	91.06220	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-20'	91.06220	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-20'	91.06220	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-20'	91.06220	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-20'	91.06220	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-20'	91.06220	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-20'	91.06220	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-20'	91.06220	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-20'	91.06220	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-20'	91.06220	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-20'	91.06220	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-20'	91.06220	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-20'	.06220	95498	< 5.	UG/KG	1	o-Chlorotoluene
AB-6-20'	91.06220	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-20'	91.06220	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-20'	91.06220	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-20'	91.06220	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-20'	91.06220	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-20'	91.06220	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-20'	91.06220	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-20'	91.06220	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-20'	91.06220	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-20'	91.06220	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-20'	91.06220	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-20'	91.06220	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-20'	91.06220	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-20'	91.06220	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-20'	91.06220	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6 20'	91.06220	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-20'	91.06220	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-20'	91.06220	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-20'	91.06220	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-20'	91.06220	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-20'	91.06220	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-20'	91.06220	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-20'	91.06220	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-20'	91.06220	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-20'	91.06220	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-20'	91.06220	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-20'	91.06220	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-20'	91.06220	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-20'	91.06220	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-20'	91.06220	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-20'	91.06220	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-20'	91.06220	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-20'	91.06220	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-20'	91.06220	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-20'	91.06220	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-20'	91.06220	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-20'	91.06220	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-20'	91.06220	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-20'	91.06220	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-20'	91.06220	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-20'	91.06220	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-20'	91.06220	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-20'	91.06220	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentative .entified Compounds in Customer Sample # 91.06220

none

Customer Sample Duplicate Results for Sample # 91.06220

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06220

none

REPORT NUM. 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06221

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/12/91 Date Analyzed: 7/12/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-25'	91.06221	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-25'	91.06221	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-25'	91.06221	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-25'	91.06221	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-25'	91.06221	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-25'	91.06221	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-25'	91.06221	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-25'	91.06221	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-25'	91.06221	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-25'	91.06221	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-25'	91.06221	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-25'	91.06221	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-25'	91.06221	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-25'	91.06221	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-25'	91.06221	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-25'	91.06221	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-25'	91.06221	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-25'	91.06221	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-25'	91.06221	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-25'	91.06221	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-25'	91.06221	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-25'	91.06221	95498	< 5.	UG/KG	7/17/91	o-Chlorotoluene
AB-6-25'	91.06221	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-25'	91.06221	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-25'	91.06221	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-25'	91.06221	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-25'	91.06221	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-25'	91.06221	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-25'	91.06221	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-25'	91.06221	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-25'	91.06221	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-25'	91.06221	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-25'	91.06221	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-25'	91.06221	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-25'	91.06221	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-25'	91.06221	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-25'	91.06221	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-25'	91.06221	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-25'	91.06221	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-25'	91.06221	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-25'	91.06221	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-25'	91.06221	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-25'	91.06221	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-25'	91.06221	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-25'	91.06221	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-25'	91.06221	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-25'	91.06221	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-25'	91.06221	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-25'	91.06221	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-25'	91.06221	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-25'	91.06221	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-25'	91.06221	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-25'	91.06221	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-25'	91.06221	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-25'	91.06221	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-25'	91.06221	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-25'	91.06221	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-25'	91.06221	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-25'	91.06221	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-25'	91.06221	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-25'	91.06221	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-25'	91.06221	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-25'	91.06221	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-25'	91.06221	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-25'	91.06221	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06221

none

Customer Sample Duplicate Results for Sample # 91.06221

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06221

none

REPORT NU 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06222

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/12/91 Date Analyzed: 7/12/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-30'	91.06222	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-30'	91.06222	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-30'	91.06222	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-30'	91.06222	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-30'	91.06222	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-30'	91.06222	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-30'	91.06222	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-30'	91.06222	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-30'	91.06222	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-30'	91.06222	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-30'	91.06222	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-30'	91.06222	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-30'	91.06222	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-30'	91.06222	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-30'	91.06222	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-30'	91.06222	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-30'	91.06222	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-30'	91.06222	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-30'	91.06222	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-30'	91.06222	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-30'	91.06222	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-30'	.06222	95498	< 5.	UG/KG	1	o-Chlorotoluene
AB-6-30'	91.06222	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-30'	91.06222	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-30'	91.06222	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-30'	91.06222	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-30'	91.06222	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-30'	91.06222	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-30'	91.06222	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-30'	91.06222	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-30'	91.06222	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-30'	91.06222	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-30'	91.06222	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-30'	91.06222	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-30'	91.06222	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-30'	91.06222	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-30'	91.06222	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-30'	91.06222	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-30'	91.06222	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-30'	91.06222	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-30'	91.06222	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-30'	91.06222	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-30'	91.06222	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-30'	91.06222	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-30'	91.06222	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-30'	91.06222	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-30'	91.06222	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-30'	91.06222	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-30'	91.06222	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-30'	91.06222	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-30'	91.06222	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-30'	91.06222	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-30'	91.06222	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-30'	91.06222	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-30'	91.06222	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-30'	91.06222	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-30'	91.06222	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-30'	91.06222	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-30'	91.06222	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-30'	91.06222	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-30'	91.06222	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-30'	91.06222	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-30'	91.06222	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-30'	91.06222	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-30'	91.06222	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentative entified Compounds in Customer Sample # 91.06222

none

Customer Sample Duplicate Results for Sample # 91.06222

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06222

none

REPORT NO . 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06223

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/12/91 Date Analyzed: 7/12/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-40'	91.06223	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-40'	91.06223	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-40'	91.06223	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-40'	91.06223	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-40'	91.06223	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-40'	91.06223	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-40'	91.06223	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-40'	91.06223	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-40'	91.06223	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-40'	91.06223	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-40'	91.06223	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-40'	91.06223	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-40'	91.06223	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-40'	91.06223	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-40'	91.06223	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-40'	91.06223	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-40'	91.06223	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-40'	91.06223	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-40'	91.06223	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-40'	91.06223	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-40'	91.06223	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-40'	[illegible]06223	95498	< 5.	UG/KG	[illegible]	o-Chlorotoluene
AB-6-40'	91.06223	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-40'	91.06223	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-40'	91.06223	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-40'	91.06223	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-40'	91.06223	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-40'	91.06223	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-40'	91.06223	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-40'	91.06223	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-40'	91.06223	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-40'	91.06223	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-40'	91.06223	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-40'	91.06223	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-40'	91.06223	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-40'	91.06223	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-40'	91.06223	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-40'	91.06223	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-40'	91.06223	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-40'	91.06223	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-40'	91.06223	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-40'	91.06223	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-40'	91.06223	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-40'	91.06223	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-40'	91.06223	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-40'	91.06223	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-40'	91.06223	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-40'	91.06223	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-40'	91.06223	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-40'	91.06223	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-40'	91.06223	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-40'	91.06223	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-40'	91.06223	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-40'	91.06223	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-40'	91.06223	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-40'	91.06223	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-40'	91.06223	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-40'	91.06223	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-40'	91.06223	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-40'	91.06223	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-40'	91.06223	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-40'	91.06223	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-40'	91.06223	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-40'	91.06223	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-40'	91.06223	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06223

none

Customer Sample Duplicate Results for Sample # 91.06223

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06223

none

REPORT NO. : 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06224

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/12/91 Date Analyzed: 7/12/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-50'	91.06224	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-50'	91.06224	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-50'	91.06224	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-50'	91.06224	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-50'	91.06224	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-50'	91.06224	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-50'	91.06224	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-50'	91.06224	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-50'	91.06224	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-50'	91.06224	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-50'	91.06224	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-50'	91.06224	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-50'	91.06224	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-50'	91.06224	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-50'	91.06224	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-50'	91.06224	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-50'	91.06224	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-50'	91.06224	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-50'	91.06224	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-50'	91.06224	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-50'	91.06224	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-50'	06224	95498	< 5.	UG/KG	7	o-Chlorotoluene
AB-6-50'	91.06224	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-50'	91.06224	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-50'	91.06224	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-50'	91.06224	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-50'	91.06224	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-50'	91.06224	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-50'	91.06224	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-50'	91.06224	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-50'	91.06224	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-50'	91.06224	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-50'	91.06224	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-50'	91.06224	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-50'	91.06224	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-50'	91.06224	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-50'	91.06224	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-50'	91.06224	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-50'	91.06224	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-50'	91.06224	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-50'	91.06224	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-50'	91.06224	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-50'	91.06224	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-50'	91.06224	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-50'	91.06224	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-50'	91.06224	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-50'	91.06224	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-50'	91.06224	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-50'	91.06224	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-50'	91.06224	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-50'	91.06224	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-50'	91.06224	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-50'	91.06224	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-50'	91.06224	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-50'	91.06224	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-50'	91.06224	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-50'	91.06224	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-50'	91.06224	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-50'	91.06224	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-50'	91.06224	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-50'	91.06224	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-50'	91.06224	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-50'	91.06224	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-50'	91.06224	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-50'	91.06224	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06224

none

Customer Sample Duplicate Results for Sample # 91.06224

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06224

none

Matrix Spike Results for Sample # 91.06224

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-50'	91.06224	71432	51.98	54.	UG/KG	7/17/91		Benzene
AB-6-50'	91.06224	108907	51.98	51.	UG/KG	7/17/91		Chlorobenzene
AB-6-50'	91.06224	75343	51.98	65.	UG/KG	7/17/91		1,1-Dichloroethane
AB-6-50'	91.06224	108883	51.98	53.	UG/KG	7/17/91		Toluene
AB-6-50'	91.06224	79016	51.98	57.	UG/KG	7/17/91		Trichloroethene

Matrix Spike Duplicate Results for Sample # 91.06224

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-50'	91.06224	71432	51.55	57.	UG/KG	7/17/91		Benzene
AB-6-50'	91.06224	108907	51.55	53.	UG/KG	7/17/91		Chlorobenzene
AB-6-50'	91.06224	75343	51.55	66.	UG/KG	7/17/91		1,1-Dichloroethane
AB-6-50'	91.06224	108883	51.55	54.	UG/KG	7/17/91		Toluene
AB-6-50'	91.06224	79016	51.55	58.	UG/KG	7/17/91		Trichloroethene

REPORT NU. . 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06227

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/13/91 Date Analyzed: 7/13/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-80'	91.06227	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-80'	91.06227	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-80'	91.06227	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-80'	91.06227	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-80'	91.06227	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-80'	91.06227	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-80'	91.06227	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-80'	91.06227	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-80'	91.06227	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-80'	91.06227	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-80'	91.06227	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-80'	91.06227	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-80'	91.06227	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-80'	91.06227	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-80'	91.06227	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-80'	91.06227	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-80'	91.06227	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-80'	91.06227	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-80'	91.06227	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-80'	91.06227	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-80'	91.06227	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-80'	[illegible]06227	95498	< 5.	UG/KG	[illegible]	o-Chlorotoluene
AB-6-80'	[illegible].06227	106434	< 5.	UG/KG	7/[illegible]/91	p-Chlorotoluene
AB-6-80'	91.06227	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-80'	91.06227	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-80'	91.06227	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-80'	91.06227	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-80'	91.06227	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-80'	91.06227	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-80'	91.06227	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-80'	91.06227	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-80'	91.06227	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-80'	91.06227	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-80'	91.06227	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-80'	91.06227	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-80'	91.06227	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-80'	91.06227	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-80'	91.06227	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-80'	91.06227	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-80'	91.06227	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-80'	91.06227	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-80'	91.06227	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-80'	91.06227	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-80'	91.06227	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-80'	91.06227	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-80'	91.06227	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-80'	91.06227	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-80'	91.06227	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-80'	91.06227	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-80'	91.06227	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-80'	91.06227	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-80'	91.06227	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-80'	91.06227	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-80'	91.06227	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-80'	91.06227	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-80'	91.06227	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-80'	91.06227	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-80'	91.06227	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-80'	91.06227	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-80'	91.06227	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-80'	91.06227	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-80'	91.06227	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-80'	91.06227	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-80'	91.06227	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-80'	91.06227	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06227

none

Customer Sample Duplicate Results for Sample # 91.06227

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06227

none

REPORT NU 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06229

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/13/91 Date Analyzed: 7/13/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-100'	91.06229	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-100'	91.06229	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-100'	91.06229	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-100'	91.06229	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-100'	91.06229	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-100'	91.06229	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-100'	91.06229	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-100'	91.06229	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-100'	91.06229	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-100'	91.06229	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-100'	91.06229	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-100'	91.06229	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-100'	91.06229	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-100'	91.06229	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-100'	91.06229	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-100'	91.06229	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-100'	91.06229	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-100'	91.06229	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-100'	91.06229	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-100'	91.06229	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-100'	91.06229	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-100'	.06229	95498	< 5.		UG/KG	[illegible]	o-Chlorotoluene
AB-6-100'	91.06229	106434	< 5.		UG/KG	7/17/91	p-Chlorotoluene
AB-6-100'	91.06229	96128	< 10.		UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-100'	91.06229	106934	< 5.		UG/KG	7/17/91	1,2-Dibromoethane
AB-6-100'	91.06229	74953	< 5.		UG/KG	7/17/91	Dibromomethane
AB-6-100'	91.06229	95501	< 5.		UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-100'	91.06229	541731	< 5.		UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-100'	91.06229	106467	< 5.		UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-100'	91.06229	75718	< 10.		UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-100'	91.06229	75343	< 5.		UG/KG	7/17/91	1,1-Dichloroethane
AB-6-100'	91.06229	107062	< 5.		UG/KG	7/17/91	1,2-Dichloroethane
AB-6-100'	91.06229	75354	< 5.		UG/KG	7/17/91	1,1-Dichloroethene
AB-6-100'	91.06229	156605	< 5.		UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-100'	91.06229	156592	< 5.		UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-100'	91.06229	78875	< 5.		UG/KG	7/17/91	1,2-Dichloropropane
AB-6-100'	91.06229	142289	< 5.		UG/KG	7/17/91	1,3-Dichloropropane
AB-6-100'	91.06229	594207	< 5.		UG/KG	7/17/91	2,2-Dichloropropane
AB-6-100'	91.06229	563586	< 5.		UG/KG	7/17/91	1,1-Dichloropropene
AB-6-100'	91.06229	10061015	< 5.		UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-100'	91.06229	10061026	< 5.		UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-100'	91.06229	100414	< 5.		UG/KG	7/17/91	Ethylbenzene
AB-6-100'	91.06229	591786	< 20.		UG/KG	7/17/91	2-Hexanone
AB-6-100'	91.06229	98828	< 5.		UG/KG	7/17/91	Isopropylbenzene
AB-6-100'	91.06229	99876	< 5.		UG/KG	7/17/91	4-Isopropyltoluene
AB-6-100'	91.06229	74884	< 5.		UG/KG	7/17/91	Methyl iodide
AB-6-100'	91.06229	108101	< 20.		UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-100'	91.06229	75092	77.	23.1	UG/KG	7/17/91	Methylene chloride
AB-6-100'	91.06229	103651	< 5.		UG/KG	7/17/91	Propylbenzene
AB-6-100'	91.06229	100425	< 5.		UG/KG	7/17/91	Styrene
AB-6-100'	91.06229	630206	< 5.		UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-100'	91.06229	79345	< 5.		UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-100'	91.06229	127184	< 5.		UG/KG	7/17/91	Tetrachloroethylene
AB-6-100'	91.06229	108883	< 5.		UG/KG	7/17/91	Toluene
AB-6-100'	91.06229	76131	< 5.		UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-100'	91.06229	71556	< 5.		UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-100'	91.06229	79005	< 5.		UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-100'	91.06229	79016	< 5.		UG/KG	7/17/91	Trichloroethene
AB-6-100'	91.06229	75694	< 5.		UG/KG	7/17/91	Trichlorofluoromethane
AB-6-100'	91.06229	96184	< 5.		UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-100'	91.06229	95636	< 5.		UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-100'	91.06229	108678	< 5.		UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-100'	91.06229	108054	< 10.		UG/KG	7/17/91	Vinyl acetate
AB-6-100'	91.06229	75014	< 10.		UG/KG	7/17/91	Vinyl chloride
AB-6-100'	91.06229	1330207	< 5.		UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06229

none

Customer Sample Duplicate Results for Sample # 91.06229

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06229

none

REPORT NO 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91,06230

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/16/91 Date Analyzed: 7/16/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-110'	91.06230	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-110'	91.06230	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-110'	91.06230	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-110'	91.06230	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-110'	91.06230	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-110'	91.06230	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-110'	91.06230	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-110'	91.06230	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-110'	91.06230	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-110'	91.06230	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-110'	91.06230	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-110'	91.06230	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-110'	91.06230	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-110'	91.06230	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-110'	91.06230	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-110'	91.06230	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-110'	91.06230	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-110'	91.06230	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-110'	91.06230	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-110'	91.06230	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-110'	91.06230	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-110'	.06230	95498	< 5.	UG/KG	[illegible]	o-Chlorotoluene
AB-6-110'	91.06230	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-110'	91.06230	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-110'	91.06230	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-110'	91.06230	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-110'	91.06230	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-110'	91.06230	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-110'	91.06230	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-110'	91.06230	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-110'	91.06230	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-110'	91.06230	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-110'	91.06230	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-110'	91.06230	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-110'	91.06230	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-110'	91.06230	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-110'	91.06230	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-110'	91.06230	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-110'	91.06230	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-110'	91.06230	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-110'	91.06230	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-110'	91.06230	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-110'	91.06230	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-110'	91.06230	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-110'	91.06230	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-110'	91.06230	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-110'	91.06230	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-110'	91.06230	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-110'	91.06230	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-110'	91.06230	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-110'	91.06230	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-110'	91.06230	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-110'	91.06230	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-110'	91.06230	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-110'	91.06230	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-110'	91.06230	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-110'	91.06230	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-110'	91.06230	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-110'	91.06230	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-110'	91.06230	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-110'	91.06230	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-110'	91.06230	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-110'	91.06230	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-110'	91.06230	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-110'	91.06230	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91,06230

none

Customer Sample Duplicate Results for Sample # 91,06230

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91,06230

none

REPORT NUM 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06233

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/13/91 Date Analyzed: 7/13/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-140'	91.06233	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-140'	91.06233	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-140'	91.06233	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-140'	91.06233	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-140'	91.06233	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-140'	91.06233	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-140'	91.06233	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-140'	91.06233	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-140'	91.06233	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-140'	91.06233	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-140'	91.06233	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-140'	91.06233	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-140'	91.06233	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-140'	91.06233	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-140'	91.06233	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-140'	91.06233	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-140'	91.06233	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-140'	91.06233	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-140'	91.06233	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-140'	91.06233	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-140'	91.06233	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-140'	.06233	95498	< 5.		UG/KG	[illegible]	o-Chlorotoluene
AB-6-140'	91.06233	106434	< 5.		UG/KG	7/17/91	p-Chlorotoluene
AB-6-140'	91.06233	96128	< 10.		UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-140'	91.06233	106934	< 5.		UG/KG	7/17/91	1,2-Dibromoethane
AB-6-140'	91.06233	74953	< 5.		UG/KG	7/17/91	Dibromomethane
AB-6-140'	91.06233	95501	< 5.		UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-140'	91.06233	541731	< 5.		UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-140'	91.06233	106467	< 5.		UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-140'	91.06233	75718	< 10.		UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-140'	91.06233	75343	< 5.		UG/KG	7/17/91	1,1-Dichloroethane
AB-6-140'	91.06233	107062	< 5.		UG/KG	7/17/91	1,2-Dichloroethane
AB-6-140'	91.06233	75354	< 5.		UG/KG	7/17/91	1,1-Dichloroethene
AB-6-140'	91.06233	156605	< 5.		UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-140'	91.06233	156592	< 5.		UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-140'	91.06233	78875	< 5.		UG/KG	7/17/91	1,2-Dichloropropane
AB-6-140'	91.06233	142289	< 5.		UG/KG	7/17/91	1,3-Dichloropropane
AB-6-140'	91.06233	594207	< 5.		UG/KG	7/17/91	2,2-Dichloropropane
AB-6-140'	91.06233	563586	< 5.		UG/KG	7/17/91	1,1-Dichloropropene
AB-6-140'	91.06233	10061015	< 5.		UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-140'	91.06233	10061026	< 5.		UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-140'	91.06233	100414	< 5.		UG/KG	7/17/91	Ethylbenzene
AB-6-140'	91.06233	591786	< 20.		UG/KG	7/17/91	2-Hexanone
AB-6-140'	91.06233	98828	< 5.		UG/KG	7/17/91	Isopropylbenzene
AB-6-140'	91.06233	99876	< 5.		UG/KG	7/17/91	4-Isopropyltoluene
AB-6-140'	91.06233	74884	< 5.		UG/KG	7/17/91	Methyl iodide
AB-6-140'	91.06233	108101	< 20.		UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-140'	91.06233	75092	82.	24.6	UG/KG	7/17/91	Methylene chloride
AB-6-140'	91.06233	103651	< 5.		UG/KG	7/17/91	Propylbenzene
AB-6-140'	91.06233	100425	< 5.		UG/KG	7/17/91	Styrene
AB-6-140'	91.06233	630206	< 5.		UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-140'	91.06233	79345	< 5.		UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-140'	91.06233	127184	< 5.		UG/KG	7/17/91	Tetrachloroethylene
AB-6-140'	91.06233	108883	< 5.		UG/KG	7/17/91	Toluene
AB-6-140'	91.06233	76131	< 5.		UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-140'	91.06233	71556	< 5.		UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-140'	91.06233	79005	< 5.		UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-140'	91.06233	79016	< 5.		UG/KG	7/17/91	Trichloroethene
AB-6-140'	91.06233	75694	< 5.		UG/KG	7/17/91	Trichlorofluoromethane
AB-6-140'	91.06233	96184	< 5.		UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-140'	91.06233	95636	< 5.		UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-140'	91.06233	108678	< 5.		UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-140'	91.06233	108054	< 10.		UG/KG	7/17/91	Vinyl acetate
AB-6-140'	91.06233	75014	< 10.		UG/KG	7/17/91	Vinyl chloride
AB-6-140'	91.06233	1330207	< 5.		UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06233

none

Customer Sample Duplicate Results for Sample # 91.06233

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06233

none

REPORT NU 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06234

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/13/91 Date Analyzed: 7/13/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-150'	91.06234	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-150'	91.06234	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-150'	91.06234	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-150'	91.06234	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-150'	91.06234	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-150'	91.06234	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-150'	91.06234	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-150'	91.06234	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-150'	91.06234	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-150'	91.06234	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-150'	91.06234	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-150'	91.06234	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-150'	91.06234	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-150'	91.06234	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-150'	91.06234	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-150'	91.06234	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-150'	91.06234	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-150'	91.06234	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-150'	91.06234	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-150'	91.06234	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-150'	91.06234	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-150'	[illegible].06234	95498	< 5.		UG/KG	[illegible]	o-Chlorotoluene
AB-6-150'	91.06234	106434	< 5.		UG/KG	7/17/91	p-Chlorotoluene
AB-6-150'	91.06234	96128	< 10.		UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-150'	91.06234	106934	< 5.		UG/KG	7/17/91	1,2-Dibromoethane
AB-6-150'	91.06234	74953	< 5.		UG/KG	7/17/91	Dibromomethane
AB-6-150'	91.06234	95501	< 5.		UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-150'	91.06234	541731	< 5.		UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-150'	91.06234	106467	< 5.		UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-150'	91.06234	75718	< 10.		UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-150'	91.06234	75343	< 5.		UG/KG	7/17/91	1,1-Dichloroethane
AB-6-150'	91.06234	107062	< 5.		UG/KG	7/17/91	1,2-Dichloroethane
AB-6-150'	91.06234	75354	< 5.		UG/KG	7/17/91	1,1-Dichloroethene
AB-6-150'	91.06234	156605	< 5.		UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-150'	91.06234	156592	< 5.		UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-150'	91.06234	78875	< 5.		UG/KG	7/17/91	1,2-Dichloropropane
AB-6-150'	91.06234	142289	< 5.		UG/KG	7/17/91	1,3-Dichloropropane
AB-6-150'	91.06234	594207	< 5.		UG/KG	7/17/91	2,2-Dichloropropane
AB-6-150'	91.06234	563586	< 5.		UG/KG	7/17/91	1,1-Dichloropropene
AB-6-150'	91.06234	10061015	< 5.		UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-150'	91.06234	10061026	< 5.		UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-150'	91.06234	100414	< 5.		UG/KG	7/17/91	Ethylbenzene
AB-6-150'	91.06234	591786	< 20.		UG/KG	7/17/91	2-Hexanone
AB-6-150'	91.06234	98828	< 5.		UG/KG	7/17/91	Isopropylbenzene
AB-6-150'	91.06234	99876	< 5.		UG/KG	7/17/91	4-Isopropyltoluene
AB-6-150'	91.06234	74884	< 5.		UG/KG	7/17/91	Methyl iodide
AB-6-150'	91.06234	108101	< 20.		UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-150'	91.06234	75092	72.	21.6	UG/KG	7/17/91	Methylene chloride
AB-6-150'	91.06234	103651	< 5.		UG/KG	7/17/91	Propylbenzene
AB-6-150'	91.06234	100425	< 5.		UG/KG	7/17/91	Styrene
AB-6-150'	91.06234	630206	< 5.		UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-150'	91.06234	79345	< 5.		UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-150'	91.06234	127184	< 5.		UG/KG	7/17/91	Tetrachloroethylene
AB-6-150'	91.06234	108883	< 5.		UG/KG	7/17/91	Toluene
AB-6-150'	91.06234	76131	< 5.		UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-150'	91.06234	71556	< 5.		UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-150'	91.06234	79005	< 5.		UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-150'	91.06234	79016	< 5.		UG/KG	7/17/91	Trichloroethene
AB-6-150'	91.06234	75694	< 5.		UG/KG	7/17/91	Trichlorofluoromethane
AB-6-150'	91.06234	96184	< 5.		UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-150'	91.06234	95636	< 5.		UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-150'	91.06234	108678	< 5.		UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-150'	91.06234	108054	< 10.		UG/KG	7/17/91	Vinyl acetate
AB-6-150'	91.06234	75014	< 10.		UG/KG	7/17/91	Vinyl chloride
AB-6-150'	91.06234	1330207	< 5.		UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06234

none

Customer Sample Duplicate Results for Sample # 91.06234

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06234

none

REPORT NUM 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91,06240

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/12/91 Date Analyzed: 7/12/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-25'QA	91.06240	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-25'QA	91.06240	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-25'QA	91.06240	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-25'QA	91.06240	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-25'QA	91.06240	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-25'QA	91.06240	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-25'QA	91.06240	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-25'QA	91.06240	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-25'QA	91.06240	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-25'QA	91.06240	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-25'QA	91.06240	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-25'QA	91.06240	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-25'QA	91.06240	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-25'QA	91.06240	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-25'QA	91.06240	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-25'QA	91.06240	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-25'QA	91.06240	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-25'QA	91.06240	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-25'QA	91.06240	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-25'QA	91.06240	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-25'QA	91.06240	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-25'QA	[illegible]06240	95498	< 5.	UG/KG	[illegible]	o-Chlorotoluene
AB-6-25'QA	[illegible].06240	106434	< 5.	UG/KG	7/[illegible]/91	p-Chlorotoluene
AB-6-25'QA	91.06240	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-25'QA	91.06240	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-25'QA	91.06240	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-25'QA	91.06240	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-25'QA	91.06240	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-25'QA	91.06240	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-25'QA	91.06240	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-25'QA	91.06240	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-25'QA	91.06240	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-25'QA	91.06240	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-25'QA	91.06240	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-25'QA	91.06240	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-25'QA	91.06240	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-25'QA	91.06240	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-25'QA	91.06240	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-25'QA	91.06240	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-25'QA	91.06240	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-25'QA	91.06240	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-25'QA	91.06240	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-25'QA	91.06240	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-25'QA	91.06240	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-25'QA	91.06240	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-25'QA	91.06240	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-25'QA	91.06240	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-25'QA	91.06240	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-25'QA	91.06240	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-25'QA	91.06240	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-25'QA	91.06240	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-25'QA	91.06240	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-25'QA	91.06240	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-25'QA	91.06240	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-25'QA	91.06240	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-25'QA	91.06240	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-25'QA	91.06240	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-25'QA	91.06240	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-25'QA	91.06240	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-25'QA	91.06240	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-25'QA	91.06240	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-25'QA	91.06240	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-25'QA	91.06240	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-25'QA	91.06240	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-25'QA	91.06240	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06240

none

Customer Sample Duplicate Results for Sample # 91.06240

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06240

none

REPORT NU 10957

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06393

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/13/91 Date Analyzed: 7/13/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-TB	91.06393	67641	< 20.		UG/KG	7/17/91		Acetone
AB-6-TB	91.06393	107028	< 100.		UG/KG	7/17/91		Acrolein
AB-6-TB	91.06393	107131	< 100.		UG/KG	7/17/91		Acrylonitrile
AB-6-TB	91.06393	71432	< 5.		UG/KG	7/17/91		Benzene
AB-6-TB	91.06393	108861	< 5.		UG/KG	7/17/91		Bromobenzene
AB-6-TB	91.06393	74975	< 5.		UG/KG	7/17/91		Bromochloromethane
AB-6-TB	91.06393	75274	< 5.		UG/KG	7/17/91		Bromodichloromethane
AB-6-TB	91.06393	75252	< 5.		UG/KG	7/17/91		Bromoform
AB-6-TB	91.06393	74839	< 10.		UG/KG	7/17/91		Bromomethane
AB-6-TB	91.06393	78933	< 20.		UG/KG	7/17/91		2-Butanone
AB-6-TB	91.06393	104518	< 5.		UG/KG	7/17/91		n-Butylbenzene
AB-6-TB	91.06393	135988	< 5.		UG/KG	7/17/91		sec-Butylbenzene
AB-6-TB	91.06393	98066	< 5.		UG/KG	7/17/91		tert-Butylbenzene
AB-6-TB	91.06393	75150	< 5.		UG/KG	7/17/91		Carbon disulfide
AB-6-TB	91.06393	56235	< 5.		UG/KG	7/17/91		Carbon tetrachloride
AB-6-TB	91.06393	108907	< 5.		UG/KG	7/17/91		Chlorobenzene
AB-6-TB	91.06393	124481	< 5.		UG/KG	7/17/91		Chlorodibromomethane
AB-6-TB	91.06393	75003	< 10.		UG/KG	7/17/91		Chloroethane
AB-6-TB	91.06393	110758	< 50.		UG/KG	7/17/91		2-Chloroethylvinyl ether
AB-6-TB	91.06393	67663	< 5.		UG/KG	7/17/91		Chloroform
AB-6-TB	91.06393	74873	< 10.		UG/KG	7/17/91		Chloromethane

AB-6-TB	06393	95498	< 5.	UG/KG	[illegible]	o-Chlorotoluene
AB-6-TB	91.06393	106434	< 5.	UG/KG	7/17/91	p-Chlorotoluene
AB-6-TB	91.06393	96128	< 10.	UG/KG	7/17/91	1,2-Dibromo-3-chloropropane
AB-6-TB	91.06393	106934	< 5.	UG/KG	7/17/91	1,2-Dibromoethane
AB-6-TB	91.06393	74953	< 5.	UG/KG	7/17/91	Dibromomethane
AB-6-TB	91.06393	95501	< 5.	UG/KG	7/17/91	o-Dichlorobenzene (1,2)
AB-6-TB	91.06393	541731	< 5.	UG/KG	7/17/91	m-Dichlorobenzene (1,3)
AB-6-TB	91.06393	106467	< 5.	UG/KG	7/17/91	p-Dichlorobenzene (1,4)
AB-6-TB	91.06393	75718	< 10.	UG/KG	7/17/91	Dichlorodifluoromethane
AB-6-TB	91.06393	75343	< 5.	UG/KG	7/17/91	1,1-Dichloroethane
AB-6-TB	91.06393	107062	< 5.	UG/KG	7/17/91	1,2-Dichloroethane
AB-6-TB	91.06393	75354	< 5.	UG/KG	7/17/91	1,1-Dichloroethene
AB-6-TB	91.06393	156605	< 5.	UG/KG	7/17/91	trans-1,2-Dichloroethene
AB-6-TB	91.06393	156592	< 5.	UG/KG	7/17/91	cis-1,2-Dichloroethylene
AB-6-TB	91.06393	78875	< 5.	UG/KG	7/17/91	1,2-Dichloropropane
AB-6-TB	91.06393	142289	< 5.	UG/KG	7/17/91	1,3-Dichloropropane
AB-6-TB	91.06393	594207	< 5.	UG/KG	7/17/91	2,2-Dichloropropane
AB-6-TB	91.06393	563586	< 5.	UG/KG	7/17/91	1,1-Dichloropropene
AB-6-TB	91.06393	10061015	< 5.	UG/KG	7/17/91	cis-1,3-Dichloropropene
AB-6-TB	91.06393	10061026	< 5.	UG/KG	7/17/91	trans-1,3-Dichloropropene
AB-6-TB	91.06393	100414	< 5.	UG/KG	7/17/91	Ethylbenzene
AB-6-TB	91.06393	591786	< 20.	UG/KG	7/17/91	2-Hexanone
AB-6-TB	91.06393	98828	< 5.	UG/KG	7/17/91	Isopropylbenzene
AB-6-TB	91.06393	99876	< 5.	UG/KG	7/17/91	4-Isopropyltoluene
AB-6-TB	91.06393	74884	< 5.	UG/KG	7/17/91	Methyl iodide
AB-6-TB	91.06393	108101	< 20.	UG/KG	7/17/91	4-Methyl-2-pentanone
AB-6-TB	91.06393	75092	< 5.	UG/KG	7/17/91	Methylene chloride
AB-6-TB	91.06393	103651	< 5.	UG/KG	7/17/91	Propylbenzene
AB-6-TB	91.06393	100425	< 5.	UG/KG	7/17/91	Styrene
AB-6-TB	91.06393	630206	< 5.	UG/KG	7/17/91	1,1,1,2-Tetrachloroethane
AB-6-TB	91.06393	79345	< 5.	UG/KG	7/17/91	1,1,2,2-Tetrachloroethane
AB-6-TB	91.06393	127184	< 5.	UG/KG	7/17/91	Tetrachloroethylene
AB-6-TB	91.06393	108883	< 5.	UG/KG	7/17/91	Toluene
AB-6-TB	91.06393	76131	< 5.	UG/KG	7/17/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-6-TB	91.06393	71556	< 5.	UG/KG	7/17/91	1,1,1-Trichloroethane
AB-6-TB	91.06393	79005	< 5.	UG/KG	7/17/91	1,1,2-Trichloroethane
AB-6-TB	91.06393	79016	< 5.	UG/KG	7/17/91	Trichloroethene
AB-6-TB	91.06393	75694	< 5.	UG/KG	7/17/91	Trichlorofluoromethane
AB-6-TB	91.06393	96184	< 5.	UG/KG	7/17/91	1,2,3-Trichloropropane
AB-6-TB	91.06393	95636	< 5.	UG/KG	7/17/91	1,2,4-Trimethylbenzene
AB-6-TB	91.06393	108678	< 5.	UG/KG	7/17/91	1,3,5-Trimethylbenzene
AB-6-TB	91.06393	108054	< 10.	UG/KG	7/17/91	Vinyl acetate
AB-6-TB	91.06393	75014	< 10.	UG/KG	7/17/91	Vinyl chloride
AB-6-TB	91.06393	1330207	< 5.	UG/KG	7/17/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.06393

none

Customer Sample Duplicate Results for Sample # 91.06393

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06393

none

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********** HSE-9 QUALITY ASSURANCE REPORT **********

Prepared by: EAJ on 19-Jul-1991

EPA VOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Laura Tsiagkouris PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only Blind QC samples run with this batch.

____ No QC samples run with this sample batch.

____ No QC samples for this constituent and matrix type available within HSE-9

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

Blank Results

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUN
00.20227	91.06396	67641	< 20.		UG/KG	0.0		7/17/91	UNDER CONTROL	Acetone
00.20227	91.06396	107028	< 100.		UG/KG	0.0		7/17/91	UNDER CONTROL	Acrolein
00.20227	91.06396	107131	< 100.		UG/KG	0.0		7/17/91	UNDER CONTROL	Acrylonitrile
00.20227	91.06396	71432	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Benzene
00.20227	91.06396	108861	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromobenzene
00.20227	91.06396	74975	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromochloromethane
00.20227	91.06396	75274	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromodichloromethane
00.20227	91.06396	75252	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromoform
00.20227	91.06396	74839	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromomethane
00.20227	91.06396	78933	< 20.		UG/KG	0.0		7/17/91	UNDER CONTROL	2-Butanone
00.20227	91.06396	104518	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	n-Butylbenzene
00.20227	91.06396	135988	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	sec-Butylbenzene
00.20227	91.06396	98066	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	tert-Butylbenzene
00.20227	91.06396	75150	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Carbon disulfide
00.20227	91.06396	56235	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Carbon tetrachloride
00.20227	91.06396	108907	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chlorobenzene
00.20227	91.06396	124481	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chlorodibromomethane
00.20227	91.06396	75003	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chloroethane
00.20227	91.06396	110758	< 50.		UG/KG	0.0		7/17/91	UNDER CONTROL	2-Chloroethylvinyl ether
00.20227	91.06396	67663	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chloroform
00.20227	91.06396	74873	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chloromethane
00.20227	91.06396	95498	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	o-Chlorotoluene
00.20227	91.06396	106434	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	p-Chlorotoluene
00.20227	91.06396	96128	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2-Dibromo-3-chloropropane
00.20227	91.06396	106934	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2-Dibromoethane
00.20227	91.06396	74953	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Dibromomethane
00.20227	91.06396	95501	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
00.20227	91.06396	541731	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
00.20227	91.06396	106467	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
00.20227	91.06396	75718	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Dichlorodifluoromethane
00.20227	91.06396	75343	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1-Dichloroethane
00.20227	91.06396	107062	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2-Dichloroethane
00.20227	91.06396	75354	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1-Dichloroethene

00.20227	.06396	156605	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	trans-1,2-Dichl ene
00.20227	91.06396	156592	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	cis-1,2-Dichloroethylene
00.20227	91.06396	78875	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dichloropropane
00.20227	91.06396	142289	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,3-Dichloropropane
00.20227	91.06396	594207	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	2,2-Dichloropropane
00.20227	91.06396	563586	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloropropene
00.20227	91.06396	10061015	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	cis-1,3-Dichloropropene
00.20227	91.06396	10061026	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	trans-1,3-Dichloropropene
00.20227	91.06396	100414	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Ethylbenzene
00.20227	91.06396	591786	< 20.	UG/KG	0.0	7/17/91	UNDER CONTROL	2-Hexanone
00.20227	91.06396	98828	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Isopropylbenzene
00.20227	91.06396	99876	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	4-Isopropyltoluene
00.20227	91.06396	74884	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Methyl iodide
00.20227	91.06396	108101	< 20.	UG/KG	0.0	7/17/91	UNDER CONTROL	4-Methyl-2-pentanone
00.20227	91.06396	75092	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Methylene chloride
00.20227	91.06396	103651	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Propylbenzene
00.20227	91.06396	100425	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Styrene
00.20227	91.06396	630206	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,1,2-Tetrachloroethane
00.20227	91.06396	79345	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2,2-Tetrachloroethane
00.20227	91.06396	127184	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Tetrachloroethylene
00.20227	91.06396	108883	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Toluene
00.20227	91.06396	76131	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2-Trichloro-1,2,2-trifluoroet
00.20227	91.06396	71556	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,1-Trichloroethane
00.20227	91.06396	79005	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2-Trichloroethane
00.20227	91.06396	79016	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Trichloroethene
00.20227	91.06396	75694	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Trichlorofluoromethane
00.20227	91.06396	96184	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2,3-Trichloropropane
00.20227	91.06396	95636	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2,4-Trimethylbenzene
00.20227	91.06396	108678	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,3,5-Trimethylbenzene
00.20227	91.06396	108054	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Vinyl acetate
00.20227	91.06396	75014	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Vinyl chloride
00.20227	91.06396	1330207	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Mixed-Xylenes (o ± m ± p)
00.20227	91.06397	67641	< 20.	UG/KG	0.0	7/17/91	UNDER CONTROL	Acetone
00.20227	91.06397	107028	< 100.	UG/KG	0.0	7/17/91	UNDER CONTROL	Acrolein
00.20227	91.06397	107131	< 100.	UG/KG	0.0	7/17/91	UNDER CONTROL	Acrylonitrile
00.20227	91.06397	71432	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Benzene
00.20227	91.06397	108861	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromobenzene
00.20227	91.06397	74975	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromochloromethane
00.20227	91.06397	75274	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromodichloromethane
00.20227	91.06397	75252	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromoform
00.20227	91.06397	74839	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromomethane
00.20227	91.06397	78933	< 20.	UG/KG	0.0	7/17/91	UNDER CONTROL	2-Butanone
00.20227	91.06397	104518	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	n-Butylbenzene
00.20227	91.06397	135988	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	sec-Butylbenzene
00.20227	91.06397	98066	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	tert-Butylbenzene

00.20227	06397	75150	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Carbon disulfi
00.20227	91.06397	56235	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Carbon tetrachloride
00.20227	91.06397	108907	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chlorobenzene
00.20227	91.06397	124481	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chlorodibromomethane
00.20227	91.06397	75003	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chloroethane
00.20227	91.06397	110758	< 50.	UG/KG	0.0	7/17/91	UNDER CONTROL	2-Chloroethylvinyl ether
00.20227	91.06397	67663	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chloroform
00.20227	91.06397	74873	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chloromethane
00.20227	91.06397	95498	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	o-Chlorotoluene
00.20227	91.06397	106434	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	p-Chlorotoluene
00.20227	91.06397	96128	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dibromo-3-chloropropane
00.20227	91.06397	106934	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dibromoethane
00.20227	91.06397	74953	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Dibromomethane
00.20227	91.06397	95501	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
00.20227	91.06397	541731	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
00.20227	91.06397	106467	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
00.20227	91.06397	75718	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Dichlorodifluoromethane
00.20227	91.06397	75343	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloroethane
00.20227	91.06397	107062	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dichloroethane
00.20227	91.06397	75354	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloroethene
00.20227	91.06397	156605	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	trans-1,2-Dichloroethene
00.20227	91.06397	156592	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	cis-1,2-Dichloroethylene
00.20227	91.06397	78875	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dichloropropane
00.20227	91.06397	142289	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,3-Dichloropropane
00.20227	91.06397	594207	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	2,2-Dichloropropane
00.20227	91.06397	563586	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloropropene
00.20227	91.06397	10061015	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	cis-1,3-Dichloropropene
00.20227	91.06397	10061026	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	trans-1,3-Dichloropropene
00.20227	91.06397	100414	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Ethylbenzene
00.20227	91.06397	591786	< 20.	UG/KG	0.0	7/17/91	UNDER CONTROL	2-Hexanone
00.20227	91.06397	98828	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Isopropylbenzene
00.20227	91.06397	99876	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	4-Isopropyltoluene
00.20227	91.06397	74884	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Methyl iodide
00.20227	91.06397	108101	< 20.	UG/KG	0.0	7/17/91	UNDER CONTROL	4-Methyl-2-pentanone
00.20227	91.06397	75092	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Methylene chloride
00.20227	91.06397	103651	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Propylbenzene
00.20227	91.06397	100425	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Styrene
00.20227	91.06397	630206	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,1,2-Tetrachloroethane
00.20227	91.06397	79345	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2,2-Tetrachloroethane
00.20227	91.06397	127184	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Tetrachloroethylene
00.20227	91.06397	108883	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Toluene
00.20227	91.06397	76131	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2-Trichloro-1,2,2-trifluoroet
00.20227	91.06397	71556	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,1-Trichloroethane
00.20227	91.06397	79005	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2-Trichloroethane
00.20227	91.06397	79016	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Trichloroethene

00.20227	.06397	75694	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Trichlorofluoro[illegible]e
00.20227	91.06397	96184	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2,3-Trichloropropane
00.20227	91.06397	95636	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2,4-Trimethylbenzene
00.20227	91.06397	108678	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,3,5-Trimethylbenzene
00.20227	91.06397	108054	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Vinyl acetate
00.20227	91.06397	75014	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Vinyl chloride
00.20227	91.06397	1330207	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Mixed-Xylenes (o ± m ± p)
00.20227	91.06398	67641	< 20.	UG/KG	0.0	7/17/91	UNDER CONTROL	Acetone
00.20227	91.06398	107028	< 100.	UG/KG	0.0	7/17/91	UNDER CONTROL	Acrolein
00.20227	91.06398	107131	< 100.	UG/KG	0.0	7/17/91	UNDER CONTROL	Acrylonitrile
00.20227	91.06398	71432	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Benzene
00.20227	91.06398	108861	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromobenzene
00.20227	91.06398	74975	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromochloromethane
00.20227	91.06398	75274	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromodichloromethane
00.20227	91.06398	75252	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromoform
00.20227	91.06398	74839	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Bromomethane
00.20227	91.06398	78933	< 20.	UG/KG	0.0	7/17/91	UNDER CONTROL	2-Butanone
00.20227	91.06398	104518	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	n-Butylbenzene
00.20227	91.06398	135988	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	sec-Butylbenzene
00.20227	91.06398	98066	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	tert-Butylbenzene
00.20227	91.06398	75150	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Carbon disulfide
00.20227	91.06398	56235	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Carbon tetrachloride
00.20227	91.06398	108907	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chlorobenzene
00.20227	91.06398	124481	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chlorodibromomethane
00.20227	91.06398	75003	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chloroethane
00.20227	91.06398	110758	< 50.	UG/KG	0.0	7/17/91	UNDER CONTROL	2-Chloroethylvinyl ether
00.20227	91.06398	67663	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chloroform
00.20227	91.06398	74873	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Chloromethane
00.20227	91.06398	95498	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	o-Chlorotoluene
00.20227	91.06398	106434	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	p-Chlorotoluene
00.20227	91.06398	96128	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dibromo-3-chloropropane
00.20227	91.06398	106934	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dibromoethane
00.20227	91.06398	74953	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Dibromomethane
00.20227	91.06398	95501	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
00.20227	91.06398	541731	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
00.20227	91.06398	106467	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
00.20227	91.06398	75718	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Dichlorodifluoromethane
00.20227	91.06398	75343	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloroethane
00.20227	91.06398	107062	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dichloroethane
00.20227	91.06398	75354	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloroethene
00.20227	91.06398	156605	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	trans-1,2-Dichloroethene
00.20227	91.06398	156592	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	cis-1,2-Dichloroethylene
00.20227	91.06398	78875	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dichloropropane
00.20227	91.06398	142289	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	1,3-Dichloropropane
00.20227	91.06398	594207	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	2,2-Dichloropropane

00.20227	.06398	563586	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloropr
00.20227	91.06398	10061015	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	cis-1,3-Dichloropropene
00.20227	91.06398	10061026	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	trans-1,3-Dichloropropene
00.20227	91.06398	100414	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Ethylbenzene
00.20227	91.06398	591786	< 20.		UG/KG	0.0	7/17/91	UNDER CONTROL	2-Hexanone
00.20227	91.06398	98828	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Isopropylbenzene
00.20227	91.06398	99876	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	4-Isopropyltoluene
00.20227	91.06398	74884	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Methyl iodide
00.20227	91.06398	108101	< 20.		UG/KG	0.0	7/17/91	UNDER CONTROL	4-Methyl-2-pentanone
00.20227	91.06398	75092	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Methylene chloride
00.20227	91.06398	103651	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Propylbenzene
00.20227	91.06398	100425	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Styrene
00.20227	91.06398	630206	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,1,2-Tetrachloroethane
00.20227	91.06398	79345	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2,2-Tetrachloroethane
00.20227	91.06398	127184	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Tetrachloroethylene
00.20227	91.06398	108883	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Toluene
00.20227	91.06398	76131	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2-Trichloro-1,2,2-trifluoroet
00.20227	91.06398	71556	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,1-Trichloroethane
00.20227	91.06398	79005	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2-Trichloroethane
00.20227	91.06398	79016	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Trichloroethene
00.20227	91.06398	75694	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Trichlorofluoromethane
00.20227	91.06398	96184	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,2,3-Trichloropropane
00.20227	91.06398	95636	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,2,4-Trimethylbenzene
00.20227	91.06398	108678	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,3,5-Trimethylbenzene
00.20227	91.06398	108054	< 10.		UG/KG	0.0	7/17/91	UNDER CONTROL	Vinyl acetate
00.20227	91.06398	75014	< 10.		UG/KG	0.0	7/17/91	UNDER CONTROL	Vinyl chloride
00.20227	91.06398	1330207	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Mixed-Xylenes (o ± m ± p)
00.20227	91.06438	67641	70.	21.	UG/KG	0.0	7/17/91	OUT OF CONTROL	Acetone
00.20227	91.06438	107028	< 100.		UG/KG	0.0	7/17/91	UNDER CONTROL	Acrolein
00.20227	91.06438	107131	< 100.		UG/KG	0.0	7/17/91	UNDER CONTROL	Acrylonitrile
00.20227	91.06438	71432	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Benzene
00.20227	91.06438	108861	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Bromobenzene
00.20227	91.06438	74975	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Bromochloromethane
00.20227	91.06438	75274	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Bromodichloromethane
00.20227	91.06438	75252	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Bromoform
00.20227	91.06438	74839	< 10.		UG/KG	0.0	7/17/91	UNDER CONTROL	Bromomethane
00.20227	91.06438	78933	< 20.		UG/KG	0.0	7/17/91	UNDER CONTROL	2-Butanone
00.20227	91.06438	104518	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	n-Butylbenzene
00.20227	91.06438	135988	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	sec-Butylbenzene
00.20227	91.06438	98066	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	tert-Butylbenzene
00.20227	91.06438	75150	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Carbon disulfide
00.20227	91.06438	56235	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Carbon tetrachloride
00.20227	91.06438	108907	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Chlorobenzene
00.20227	91.06438	124481	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Chlorodibromomethane
00.20227	91.06438	75003	< 10.		UG/KG	0.0	7/17/91	UNDER CONTROL	Chloroethane

00.20227	.06438	110758	< 50.		UG/KG	0.0	7/17/91	UNDER CONTROL	2-Chloroethylv	ther
00.20227	91.06438	67663	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Chloroform	
00.20227	91.06438	74873	< 10.		UG/KG	0.0	7/17/91	UNDER CONTROL	Chloromethane	
00.20227	91.06438	95498	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	o-Chlorotoluene	
00.20227	91.06438	106434	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	p-Chlorotoluene	
00.20227	91.06438	96128	< 10.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dibromo-3-chloropropane	
00.20227	91.06438	106934	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dibromoethane	
00.20227	91.06438	74953	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Dibromomethane	
00.20227	91.06438	95501	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	o-Dichlorobenzene (1,2)	
00.20227	91.06438	541731	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	m-Dichlorobenzene (1,3)	
00.20227	91.06438	106467	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	p-Dichlorobenzene (1,4)	
00.20227	91.06438	75718	< 10.		UG/KG	0.0	7/17/91	UNDER CONTROL	Dichlorodifluoromethane	
00.20227	91.06438	75343	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloroethane	
00.20227	91.06438	107062	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dichloroethane	
00.20227	91.06438	75354	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloroethene	
00.20227	91.06438	156605	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	trans-1,2-Dichloroethene	
00.20227	91.06438	156592	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	cis-1,2-Dichloroethylene	
00.20227	91.06438	78875	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,2-Dichloropropane	
00.20227	91.06438	142289	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,3-Dichloropropane	
00.20227	91.06438	594207	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	2,2-Dichloropropane	
00.20227	91.06438	563586	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1-Dichloropropene	
00.20227	91.06438	10061015	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	cis-1,3-Dichloropropene	
00.20227	91.06438	10061026	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	trans-1,3-Dichloropropene	
00.20227	91.06438	100414	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Ethylbenzene	
00.20227	91.06438	591786	< 20.		UG/KG	0.0	7/17/91	UNDER CONTROL	2-Hexanone	
00.20227	91.06438	98828	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Isopropylbenzene	
00.20227	91.06438	99876	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	4-Isopropyltoluene	
00.20227	91.06438	74884	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Methyl iodide	
00.20227	91.06438	108101	< 20.		UG/KG	0.0	7/17/91	UNDER CONTROL	4-Methyl-2-pentanone	
00.20227	91.06438	75092	110.	33.	UG/KG	0.0	7/17/91	OUT OF CONTROL	Methylene chloride	
00.20227	91.06438	103651	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Propylbenzene	
00.20227	91.06438	100425	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Styrene	
00.20227	91.06438	630206	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,1,2-Tetrachloroethane	
00.20227	91.06438	79345	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2,2-Tetrachloroethane	
00.20227	91.06438	127184	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Tetrachloroethylene	
00.20227	91.06438	108883	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Toluene	
00.20227	91.06438	76131	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2-Trichloro-1,2,2-trifluoroet	
00.20227	91.06438	71556	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,1-Trichloroethane	
00.20227	91.06438	79005	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,1,2-Trichloroethane	
00.20227	91.06438	79016	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Trichloroethene	
00.20227	91.06438	75694	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	Trichlorofluoromethane	
00.20227	91.06438	96184	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,2,3-Trichloropropane	
00.20227	91.06438	95636	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,2,4-Trimethylbenzene	
00.20227	91.06438	108678	< 5.		UG/KG	0.0	7/17/91	UNDER CONTROL	1,3,5-Trimethylbenzene	
00.20227	91.06438	108054	< 10.		UG/KG	0.0	7/17/91	UNDER CONTROL	Vinyl acetate	

00.20227	1.06438	75014	< 10.	UG/KG	0.0	7/17/91	UNDER CONTROL	Vinyl chloride
00.20227	91.06438	1330207	< 5.	UG/KG	0.0	7/17/91	UNDER CONTROL	Mixed-Xylenes (o ± m ± p)

Blank Spike Results

none

Blank Spike Duplicate Results

none

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

Blind QC Results, Sample # 91.06394

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/13/91 Date Analyzed: 7/13/91

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
91.06394	67641	76.	22.8	UG/KG	138.	14.	7/17/91	WARNING 2-3 SIG	Acetone
91.06394	107028	< 100.		UG/KG	0.0		7/17/91	UNDER CONTROL	Acrolein
91.06394	107131	< 100.		UG/KG	0.0		7/17/91	UNDER CONTROL	Acrylonitrile
91.06394	71432	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Benzene
91.06394	108861	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromobenzene
91.06394	74975	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromochloromethane
91.06394	75274	110.	33.	UG/KG	103.	10.	7/17/91	UNDER CONTROL	Bromodichloromethane
91.06394	75252	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromoform
91.06394	74839	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromomethane
91.06394	78933	71.	21.3	UG/KG	142.	14.	7/17/91	WARNING 2-3 SIG	2-Butanone
91.06394	104518	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	n-Butylbenzene
91.06394	135988	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	sec-Butylbenzene
91.06394	98066	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	tert-Butylbenzene
91.06394	75150	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Carbon disulfide
91.06394	56235	150.	45.	UG/KG	106.	10.	7/17/91	UNDER CONTROL	Carbon tetrachloride
91.06394	108907	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chlorobenzene
91.06394	124481	140.	42.	UG/KG	148.	15.	7/17/91	UNDER CONTROL	Chlorodibromomethane
91.06394	75003	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chloroethane
91.06394	110758	< 50.		UG/KG	0.0		7/17/91	UNDER CONTROL	2-Chloroethylvinyl ether
91.06394	67663	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chloroform
91.06394	74873	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chloromethane
91.06394	95498	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	o-Chlorotoluene

91.06394	[illegible]34	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	p-Chlorotoluene
91.06394	[illegible]128	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2-Dibromo-3-chloropropane
91.06394	106934	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2-Dibromoethane
91.06394	74953	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Dibromomethane
91.06394	95501	100.	30.	UG/KG	103.	10.	7/17/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
91.06394	541731	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
91.06394	106467	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
91.06394	75718	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Dichlorodifluoromethane
91.06394	75343	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1-Dichloroethane
91.06394	107062	150.	45.	UG/KG	131.	13.	7/17/91	UNDER CONTROL	1,2-Dichloroethane
91.06394	75354	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1-Dichloroethene
91.06394	156605	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	trans-1,2-Dichloroethene
91.06394	156592	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	cis-1,2-Dichloroethylene
91.06394	78875	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2-Dichloropropane
91.06394	142289	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,3-Dichloropropane
91.06394	594207	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	2,2-Dichloropropane
91.06394	563586	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1-Dichloropropene
91.06394	10061015	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	cis-1,3-Dichloropropene
91.06394	10061026	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	trans-1,3-Dichloropropene
91.06394	100414	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Ethylbenzene
91.06394	591786	< 20.		UG/KG	0.0		7/17/91	UNDER CONTROL	2-Hexanone
91.06394	98828	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Isopropylbenzene
91.06394	99876	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	4-Isopropyltoluene
91.06394	74884	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Methyl iodide
91.06394	108101	130.	39.	UG/KG	143.	14.	7/17/91	UNDER CONTROL	4-Methyl-2-pentanone
91.06394	75092	190.	57.	UG/KG	154.	15.	7/17/91	UNDER CONTROL	Methylene chloride
91.06394	103651	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Propylbenzene
91.06394	100425	100.	30.	UG/KG	120.	12.	7/17/91	UNDER CONTROL	Styrene
91.06394	630206	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1,1,2-Tetrachloroethane
91.06394	79345	110.	33.	UG/KG	112.	11.	7/17/91	UNDER CONTROL	1,1,2,2-Tetrachloroethane
91.06394	127184	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Tetrachloroethylene
91.06394	108883	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Toluene
91.06394	76131	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1,2-Trichloro-1,2,2-trifluoroethane
91.06394	71556	160.	48.	UG/KG	142.	14.	7/17/91	UNDER CONTROL	1,1,1-Trichloroethane
91.06394	79005	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1,2-Trichloroethane
91.06394	79016	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Trichloroethene
91.06394	75694	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Trichlorofluoromethane
91.06394	96184	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2,3-Trichloropropane
91.06394	95636	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2,4-Trimethylbenzene
91.06394	108678	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,3,5-Trimethylbenzene
91.06394	108054	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Vinyl acetate
91.06394	75014	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Vinyl chloride
91.06394	1330207	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Mixed-Xylenes (o ± m ± p)

Blind QC Results, Sample # 91.06395

Date Coll[illegible]: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/13/9[illegible] [illegible]te Analyzed: 7/13/91

91.06395	67641	76.	22.8	UG/KG	101.	10.	7/17/91	UNDER CONTROL	Acetone
91.06395	107028	< 100.		UG/KG	0.0		7/17/91	UNDER CONTROL	Acrolein
91.06395	107131	< 100.		UG/KG	0.0		7/17/91	UNDER CONTROL	Acrylonitrile
91.06395	71432	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Benzene
91.06395	108861	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromobenzene
91.06395	74975	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromochloromethane
91.06395	75274	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromodichloromethane
91.06395	75252	190.	57.	UG/KG	136.	14.	7/17/91	UNDER CONTROL	Bromoform
91.06395	74839	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Bromomethane
91.06395	78933	63.	18.9	UG/KG	104.	10.	7/17/91	UNDER CONTROL	2-Butanone
91.06395	104518	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	n-Butylbenzene
91.06395	135988	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	sec-Butylbenzene
91.06395	98066	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	tert-Butylbenzene
91.06395	75150	12.	3.6	UG/KG	0.0		7/17/91	OUT OF CONTROL	Carbon disulfide
91.06395	56235	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Carbon tetrachloride
91.06395	108907	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chlorobenzene
91.06395	124481	140.	42.	UG/KG	108.	11.	7/17/91	UNDER CONTROL	Chlorodibromomethane
91.06395	75003	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chloroethane
91.06395	110758	< 50.		UG/KG	0.0		7/17/91	UNDER CONTROL	2-Chloroethylvinyl ether
91.06395	67663	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chloroform
91.06395	74873	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Chloromethane
91.06395	95498	140.	42.	UG/KG	125.	12.	7/17/91	UNDER CONTROL	o-Chlorotoluene
91.06395	106434	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	p-Chlorotoluene
91.06395	96128	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2-Dibromo-3-chloropropane
91.06395	106934	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2-Dibromoethane
91.06395	74953	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Dibromomethane
91.06395	95501	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
91.06395	541731	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
91.06395	106467	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
91.06395	75718	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Dichlorodifluoromethane
91.06395	75343	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1-Dichloroethane
91.06395	107062	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2-Dichloroethane
91.06395	75354	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1-Dichloroethene
91.06395	156605	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	trans-1,2-Dichloroethene
91.06395	156592	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	cis-1,2-Dichloroethylene
91.06395	78875	150.	45.	UG/KG	133.	13.	7/17/91	UNDER CONTROL	1,2-Dichloropropane
91.06395	142289	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,3-Dichloropropane
91.06395	594207	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	2,2-Dichloropropane
91.06395	563586	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1-Dichloropropene
91.06395	10061015	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	cis-1,3-Dichloropropene
91.06395	10061026	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	trans-1,3-Dichloropropene
91.06395	100414	150.	45.	UG/KG	132.	13.	7/17/91	UNDER CONTROL	Ethylbenzene
91.06395	591786	120.	36.	UG/KG	119.	12.	7/17/91	UNDER CONTROL	2-Hexanone

91.06395	28	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Isopropylbenzene
91.06395	99876	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	4-Isopropyltoluene
91.06395	74884	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Methyl iodide
91.06395	108101	130.	39.	UG/KG	105.	10.	7/17/91	UNDER CONTROL	4-Methyl-2-pentanone
91.06395	75092	150.	45.	UG/KG	113.	11.	7/17/91	UNDER CONTROL	Methylene chloride
91.06395	103651	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Propylbenzene
91.06395	100425	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Styrene
91.06395	630206	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1,1,2-Tetrachloroethane
91.06395	79345	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1,2,2-Tetrachloroethane
91.06395	127184	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Tetrachloroethylene
91.06395	108883	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Toluene
91.06395	76131	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,1,2-Trichloro-1,2,2-trifluoroethane
91.06395	71556	150.	45.	UG/KG	104.	10.	7/17/91	UNDER CONTROL	1,1,1-Trichloroethane
91.06395	79005	170.	51.	UG/KG	131.	13.	7/17/91	UNDER CONTROL	1,1,2-Trichloroethane
91.06395	79016	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Trichloroethene
91.06395	75694	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Trichlorofluoromethane
91.06395	96184	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2,3-Trichloropropane
91.06395	95636	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,2,4-Trimethylbenzene
91.06395	108678	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	1,3,5-Trimethylbenzene
91.06395	108054	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Vinyl acetate
91.06395	75014	< 10.		UG/KG	0.0		7/17/91	UNDER CONTROL	Vinyl chloride
91.06395	1330207	< 5.		UG/KG	0.0		7/17/91	UNDER CONTROL	Mixed-Xylenes (o ± m ± p)

SURROGATE RESULTS FOR EPA VOLATILES

Surrogate 1 = 1,2-Dichloroethane d4 (CAS # = 17060070)
Surrogate 2 = Toluene d8 (CAS # = 2037265)
Surrogate 3 = 4-Bromofluorobenzene (CAS # = 460004)

SAMPLE NUMBER	UNITS	Surrogate 1	Surrogate 2	Surrogate 3	COMPLETION DATE
91.06217	%	123.06	104.88	105.48	17-Jul-1991
91.06218	%	128.14	105.74	105.24	17-Jul-1991
91.06219	%	128.32	105.8	103.62	17-Jul-1991
91.06220	%	122.24	102.48	105.42	17-Jul-1991
91.06221	%	114.34	101.44	102.48	17-Jul-1991
91.06222	%	121.66	107.3	99.82	17-Jul-1991
91.06223	%	119.64	106.56	108.7	17-Jul-1991
91.06224	%	124.82	108.38	102.08	17-Jul-1991
91.06224	%	141.6	107.28	104.5	17-Jul-1991
91.06224	%	134.52	108.94	99.88	17-Jul-1991
91.06227	%	102.28	97.28	104.16	17-Jul-1991
91.06229	%	125.	104.56	102.34	17-Jul-1991
91.06230	%	92.7	87.12	88.08	17-Jul-1991

91.06233		125.58	99.32	102.6	17-Jul-1991
91.06234	%	111.34	101.62	101.82	17-Jul-1991
91.06240	%	134.32	105.88	102.76	17-Jul-1991
91.06393	%	102.56	102.32	95.74	17-Jul-1991
91.06394	%	122.14	105.72	97.48	17-Jul-1991
91.06395	%	149.02	111.56	106.98	17-Jul-1991
91.06396	%	108.16	103.94	103.44	17-Jul-1991
91.06397	%	101.32	102.76	99.4	17-Jul-1991
91.06398	%	97.7	87.9	91.52	17-Jul-1991
91.06438	%	107.9	100.82	116.7	17-Jul-1991

EPA Limits:

Water	%	76 - 114	88 - 110	86 - 115
Soil	%	70 - 121	81 - 117	74 - 121

REPORT NUMBER: 10957

Analyst	Reviewer	Section Leader	QA Officer
7/19/91	7/19/91	7/19/91	7/22/91
Date	Date	Date	Date

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.

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Semi-Volatile Organic Analysis Data
for
Borehole 6

HSE-9 SEMIVOLATILE ORGANIC ANALYSIS
SUMMARY OF ANALYTICAL RESULTS

To: Alice Barr
From: Martin Koby

Request Number: 11696
Matrix: Soil
Summary Date: 7/19/91

Sample ID	Target Compounds Found	Amount (ug/Kg)	LOQ (ug/Kg)	TICs (Y/N)
91.06217	None	<330	330	N
91.06218	None	<330	330	N
91.06219	None	<330	330	N
91.06220	None	<330	330	N
91.06221	None	<330	330	N
91.06222	None	<330	330	N
91.06223	None	<330	330	N
91.06224	None	<330	330	N
91.06227	None	<330	330	N
91.06229	None	<330	330	N
91.06234	None	<330	330	N
91.06240	None	<330	330	N

The samples were extracted by mixing approximately 30 g of sample with 60 g sodium sulfate and sonicating with 100 ml of methylene chloride. This was repeated two more times. Sample extracts were combined, centifuged, and concentrated to a 1.0 ml final volume. Appropriate surrogate standards were added prior to extraction as a check of method efficiency. Analysis was performed by capillary column GC/MS methods. These methods are consistent with EPA SW-846 protocol.

No target compounds were detected above the practical limit of quantitation. All analytical holding times were satisfied regarding this request. If you have any questions concerning this data, please do not hesitate to call either myself or Laura Tsiagkouris at 667-5889.

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06217

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/15/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-5'	91.06217	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-5'	91.06217	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-5'	91.06217	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-5'	91.06217	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-5'	91.06217	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-5'	91.06217	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-5'	91.06217	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-5'	91.06217	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-5'	91.06217	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-5'	91.06217	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-5'	91.06217	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-5'	91.06217	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-5'	91.06217	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-5'	91.06217	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-5'	91.06217	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-5'	91.06217	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-5'	91.06217	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-5'	91.06217	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-5'	91.06217	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-5'	91.06217	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-5'	91.06217	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-5'	91.06217	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-5'	91.06217	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-5'	91.06217	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-5'	91.06217	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-5'	91.06217	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-5'	91.06217	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-5'	91.06217	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-5'	91.06217	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-5'	91.06217	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-5'	91.06217	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-5'	91.06217	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-5'	91.06217	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-5'	91.06217	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-5'	91.06217	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-5'	91.06217	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-5'	91.06217	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-5'	91.06217	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-5'	91.06217	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-5'	91.06217	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-5'	91.06217	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-5'	91.06217	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-5'	91.06217	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-5'	91.06217	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-5'	91.06217	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-5'	91.06217	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-5'	91.06217	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-5'	91.06217	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-5'	91.06217	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-5'	91.06217	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-5'	91.06217	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-5'	91.06217	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-5'	91.06217	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-5'	91.06217	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-5'	91.06217	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-5'	91.06217	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-5'	91.06217	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-5'	91.06217	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-5'	91.06217	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-5'	91.06217	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-5'	91.06217	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-5'	91.06217	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-5'	91.06217	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-5'	91.06217	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-5'	91.06217	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-5'	91.06217	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-5'	91.06217	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-5'	91.06217	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-5'	91.06217	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06217

none

Customer Sample Duplicate Results for Sample # 91.06217

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06217

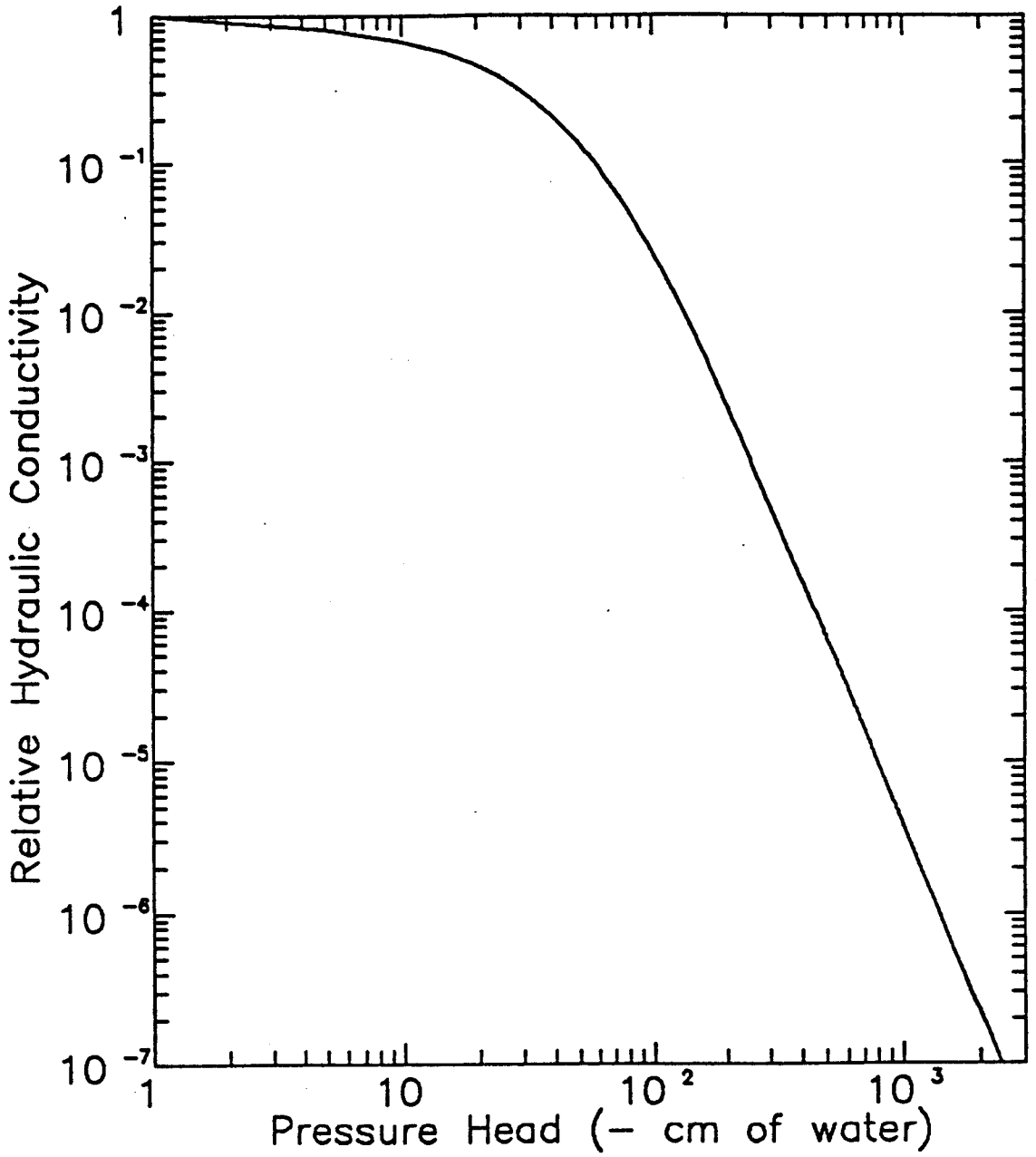
none

Matrix Spike Results for Sample # 91.06217

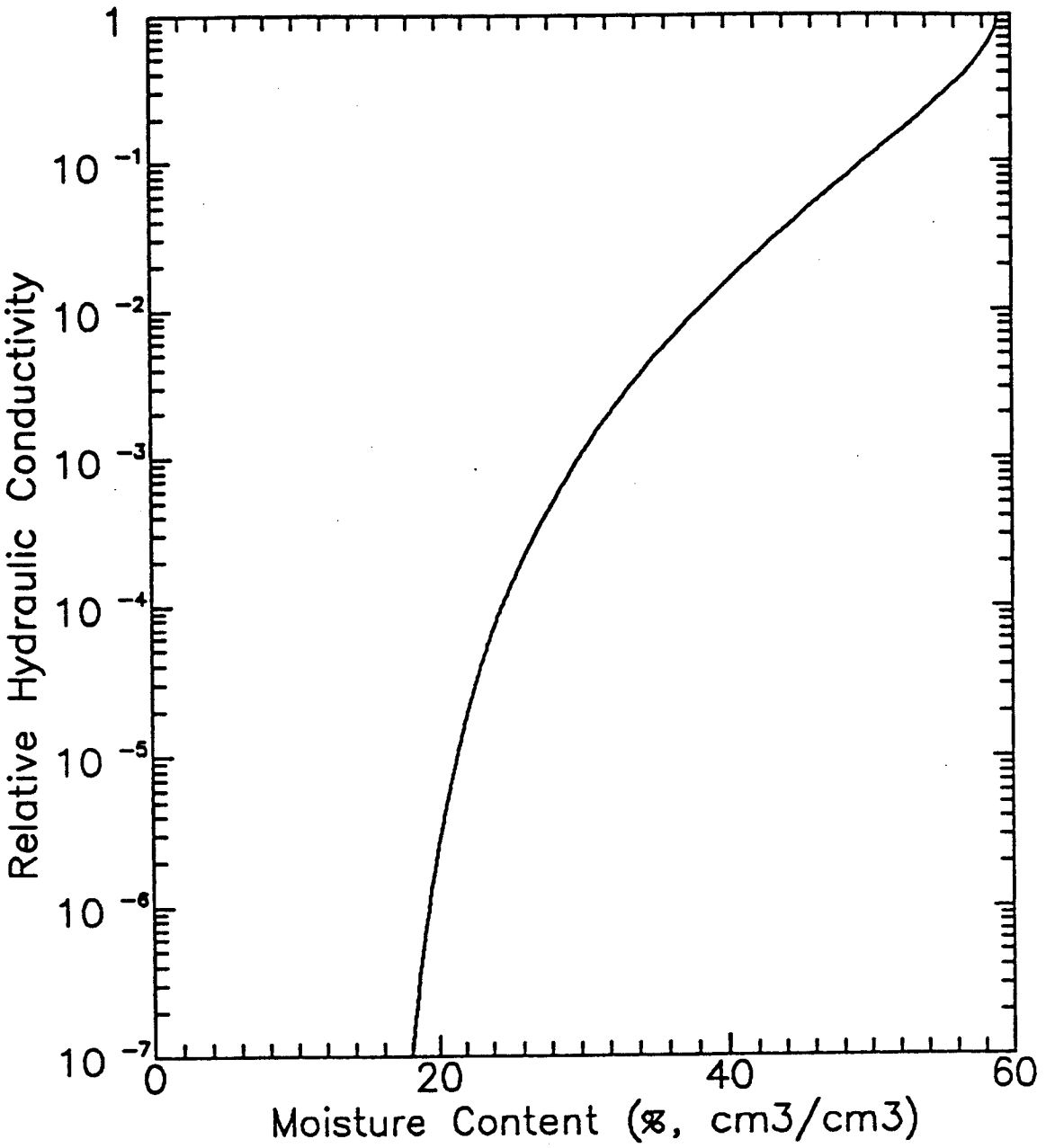
CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-5'	91.06217	83329	1880.94	1200.	UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-5'	91.06217	59507	3761.87	2500.	UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-5'	91.06217	95578	3761.87	1100.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-5'	91.06217	106467	1880.94	1100.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-5'	91.06217	121142	1880.94	1300.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-5'	91.06217	100027	3761.87	2400.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-5'	91.06217	621647	1880.94	1100.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-5'	91.06217	87865	3761.87	3200.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-5'	91.06217	108952	3761.87	2400.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-5'	91.06217	129000	1880.94	1600.	UG/KG	7/19/91	PRIORITY 1	Pyrene
AB-6-5'	91.06217	120821	1880.94	1100.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene

Matrix Spike Duplicate Results for Sample # 91.06217

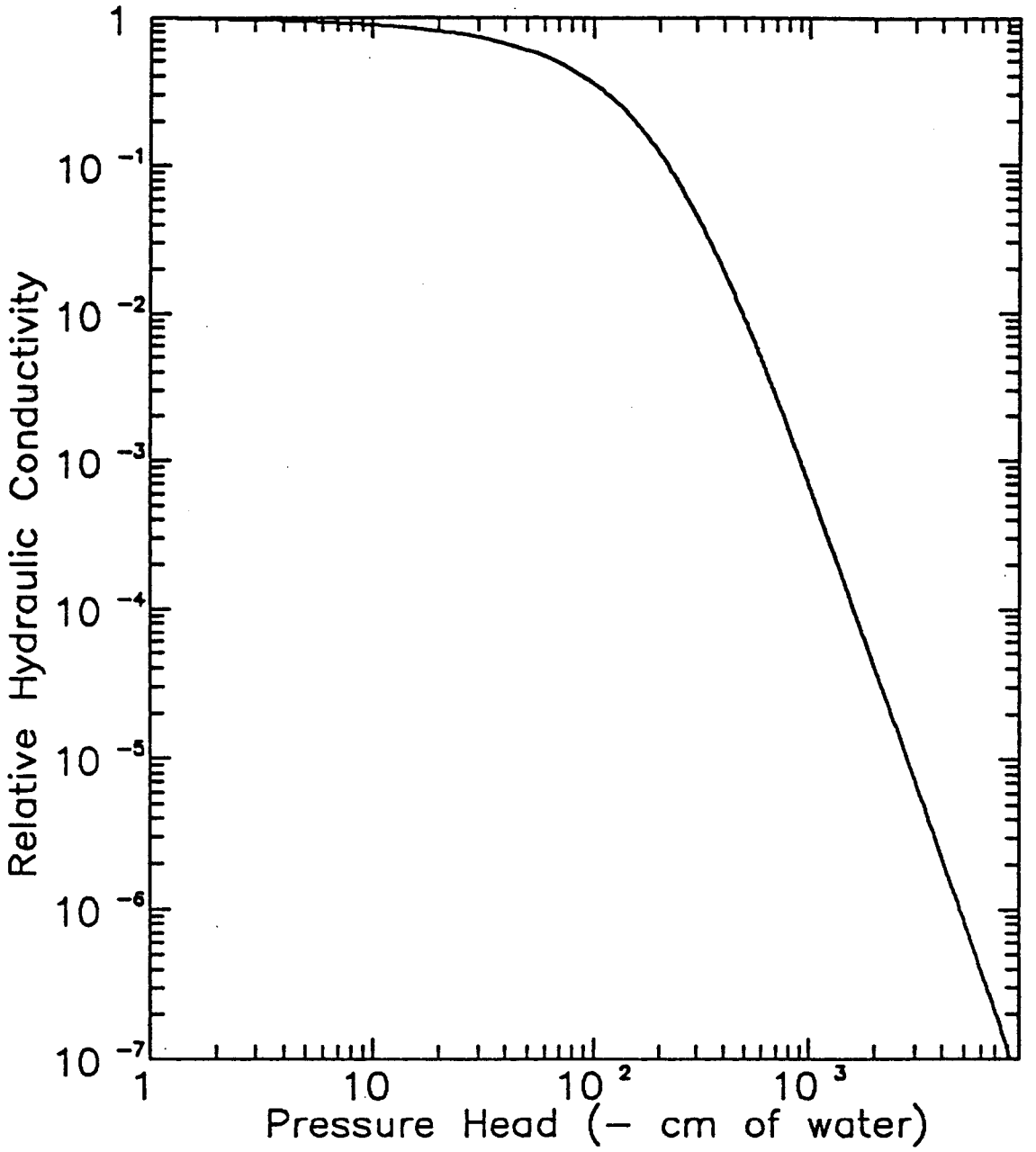
CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-5'	91.06217	83329	1897.8	770.	UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-5'	91.06217	59507	3795.61	2300.	UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-5'	91.06217	95578	3795.61	430.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-5'	91.06217	106467	1897.8	330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-5'	91.06217	121142	1897.8	1200.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-5'	91.06217	100027	3795.61	2200.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-5'	91.06217	621647	1897.8	330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine



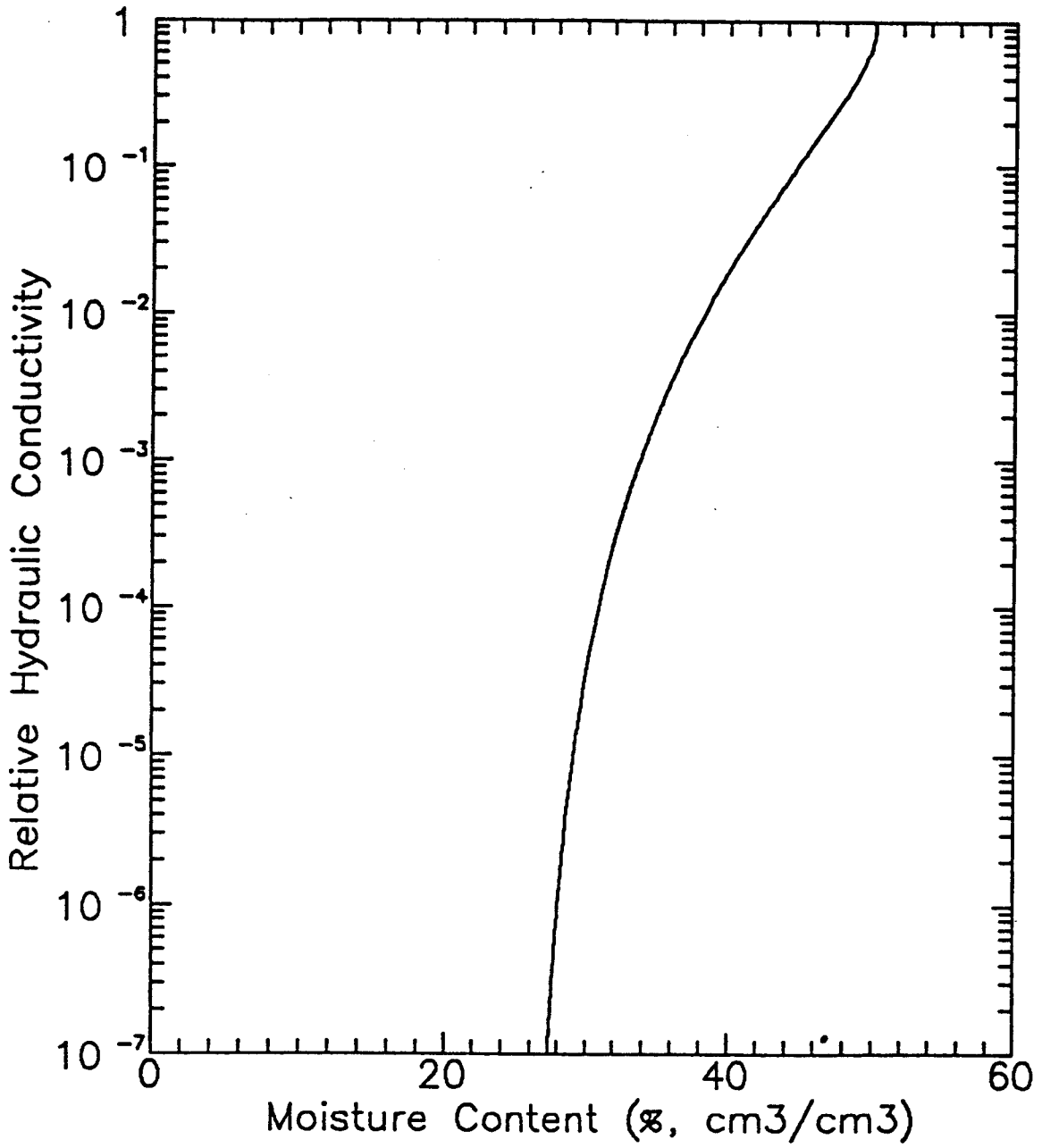
Relative Hydraulic Conductivity vs. Pressure Head, Sample SIM01 85.0–86.0 FT.



Relative Hydraulic Conductivity vs. Moisture Content, Sample SIM01 85.0–86.0



Relative Hydraulic Conductivity vs. Pressure Head, Sample SIMO1 89.0–90.0 FT.



Relative Hydraulic Conductivity vs. Moisture Content, Sample SIM01 89.0–90.0

APPENDIX E

LABORATORY METHODS

SUMMARY OF LABORATORY METHODS

Methods	Reference
Moisture Content	ASTM D 2216-80
Bulk Density	MOSA*, 1986, chp. 13, pp. 363-367
Porosity	MOSA*, 1986, chp. 18, pp. 444-445
Saturated Hydraulic Conductivity	
Constant Head	ASTM D 2434-68
Falling Head	MOSA*, 1986, chp. 28, pp. 700-703
Moisture Retention Characteristics	
Hanging Column	MOSA*, 1986, chp. 26, pp. 637-639
Pressure Plate Extractor	ASTM D 2325-68
Unsaturated Hydraulic Conductivity (Calculated)	Van Genuchten, M., 1980, "A Closed Form Equation for Predicting the Hydraulic Conductivity of Unsaturated Soils." *Soil Sci. Soc. Am. J.*, V. 44, pp. 892-898.

* *Methods of Soil Analysis, Part 1*, A. Klute ed., American Society of Agronomy, Madison, WI.

AB-6-5'	91.06217	87865	3795.61	3300.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-5'	91.06217	108952	3795.61	740.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-5'	91.06217	129000	1897.8	1600.	UG/KG	7/19/91	PRIORITY 1	Pyrene
AB-6-5'	91.06217	120821	1897.8	330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91,06218

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/15/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-10'	91.06218	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-10'	91.06218	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-10'	91.06218	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-10'	91.06218	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-10'	91.06218	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-10'	91.06218	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-10'	91.06218	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-10'	91.06218	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-10'	91.06218	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-10'	91.06218	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-10'	91.06218	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-10'	91.06218	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-10'	91.06218	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-10'	91.06218	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-10'	91.06218	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-10'	91.06218	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-10'	91.06218	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-10'	91.06218	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-10'	91.06218	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-10'	91.06218	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-10'	91.06218	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-10'	91.06218	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-10'	91.06218	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-10'	91.06218	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-10'	91.06218	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-10'	91.06218	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-10'	91.06218	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-10'	91.06218	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-10'	91.06218	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-10'	91.06218	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-10'	91.06218	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-10'	91.06218	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-10'	91.06218	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-10'	91.06218	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-10'	91.06218	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-10'	91.06218	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-10'	91.06218	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-10'	91.06218	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-10'	91.06218	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-10'	91.06218	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-10'	91.06218	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-10'	91.06218	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-10'	91.06218	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-10'	91.06218	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-10'	91.06218	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-10'	91.06218	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-10'	91.06218	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-10'	91.06218	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-10'	91.06218	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-10'	91.06218	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-10'	91.06218	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-10'	91.06218	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-10'	91.06218	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-10'	91.06218	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-10'	91.06218	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-10'	91.06218	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-10'	91.06218	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-10'	91.06218	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-10'	91.06218	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-10'	91.06218	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-10'	91.06218	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-10'	91.06218	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-10'	91.06218	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-10'	91.06218	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-10'	91.06218	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-10'	91.06218	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-10'	91.06218	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-10'	91.06218	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-10'	91.06218	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06218

none

Customer Sample Duplicate Results for Sample # 91.06218

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06218

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06219

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/15/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-15'	91.06219	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-15'	91.06219	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-15'	91.06219	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-15'	91.06219	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-15'	91.06219	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-15'	91.06219	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-15'	91.06219	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-15'	91.06219	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-15'	91.06219	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-15'	91.06219	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-15'	91.06219	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-15'	91.06219	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-15'	91.06219	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-15'	91.06219	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-15'	91.06219	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-15'	91.06219	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-15'	91.06219	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-15'	91.06219	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-15'	91.06219	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-15'	91.06219	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-15'	91.06219	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-15'	91.06219	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-15'	91.06219	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-15'	91.06219	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-15'	91.06219	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-15'	91.06219	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-15'	91.06219	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-15'	91.06219	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-15'	91.06219	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-15'	91.06219	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-15'	91.06219	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-15'	91.06219	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-15'	91.06219	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-15'	91.06219	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-15'	91.06219	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-15'	91.06219	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-15'	91.06219	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-15'	91.06219	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-15'	91.06219	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-15'	91.06219	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-15'	91.06219	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-15'	91.06219	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-15'	91.06219	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-15'	91.06219	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-15'	91.06219	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-15'	91.06219	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-15'	91.06219	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-15'	91.06219	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-15'	91.06219	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-15'	91.06219	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-15'	91.06219	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-15'	91.06219	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-15'	91.06219	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-15'	91.06219	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-15'	91.06219	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-15'	91.06219	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-15'	91.06219	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-15'	91.06219	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-15'	91.06219	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-15'	91.06219	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-15'	91.06219	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-15'	91.06219	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-15'	91.06219	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-15'	91.06219	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-15'	91.06219	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-15'	91.06219	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-15'	91.06219	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-15'	91.06219	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-15'	91.06219	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06219

none

Customer Sample Duplicate Results for Sample # 91.06219

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06219

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06220

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/15/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-20'	91.06220	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-20'	91.06220	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-20'	91.06220	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-20'	91.06220	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-20'	91.06220	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-20'	91.06220	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-20'	91.06220	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-20'	91.06220	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-20'	91.06220	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-20'	91.06220	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-20'	91.06220	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-20'	91.06220	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-20'	91.06220	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-20'	91.06220	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-20'	91.06220	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-20'	91.06220	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-20'	91.06220	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-20'	91.06220	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-20'	91.06220	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-20'	91.06220	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-20'	91.06220	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-20'	91.06220	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-20'	91.06220	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-20'	91.06220	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-20'	91.06220	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-20'	91.06220	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-20'	91.06220	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-20'	91.06220	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-20'	91.06220	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-20'	91.06220	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-20'	91.06220	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-20'	91.06220	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-20'	91.06220	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-20'	91.06220	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-20'	91.06220	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-20'	91.06220	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-20'	91.06220	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-20'	91.06220	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-20'	91.06220	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-20'	91.06220	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-20'	91.06220	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-20'	91.06220	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-20'	91.06220	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-20'	91.06220	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-20'	91.06220	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-20'	91.06220	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-20'	91.06220	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-20'	91.06220	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-20'	91.06220	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-20'	91.06220	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-20'	91.06220	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-20'	91.06220	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-20'	91.06220	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-20'	91.06220	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-20'	91.06220	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-20'	91.06220	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-20'	91.06220	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-20'	91.06220	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-20'	91.06220	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-20'	91.06220	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-20'	91.06220	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-20'	91.06220	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-20'	91.06220	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-20'	91.06220	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-20'	91.06220	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-20'	91.06220	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-20'	91.06220	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-20'	91.06220	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-20'	91.06220	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06220

none

Customer Sample Duplicate Results for Sample # 91.06220

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06220

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06221

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/15/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-25'	91.06221	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-25'	91.06221	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-25'	91.06221	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-25'	91.06221	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-25'	91.06221	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-25'	91.06221	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-25'	91.06221	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-25'	91.06221	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-25'	91.06221	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-25'	91.06221	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-25'	91.06221	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-25'	91.06221	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-25'	91.06221	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-25'	91.06221	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-25'	91.06221	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-25'	91.06221	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-25'	91.06221	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-25'	91.06221	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-25'	91.06221	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-25'	91.06221	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-25'	91.06221	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-25'	91.06221	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-25'	91.06221	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-25'	91.06221	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-25'	91.06221	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-25'	91.06221	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-25'	91.06221	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-25'	91.06221	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-25'	91.06221	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-25'	91.06221	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-25'	91.06221	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-25'	91.06221	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-25'	91.06221	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-25'	91.06221	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-25'	91.06221	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-25'	91.06221	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-25'	91.06221	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-25'	91.06221	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-25'	91.06221	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-25'	91.06221	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-25'	91.06221	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-25'	91.06221	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-25'	91.06221	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-25'	91.06221	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-25'	91.06221	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-25'	91.06221	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-25'	91.06221	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-25'	91.06221	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-25'	91.06221	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-25'	91.06221	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-25'	91.06221	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-25'	91.06221	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-25'	91.06221	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-25'	91.06221	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-25'	91.06221	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-25'	91.06221	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-25'	91.06221	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-25'	91.06221	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-25'	91.06221	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-25'	91.06221	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-25'	91.06221	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-25'	91.06221	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-25'	91.06221	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-25'	91.06221	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-25'	91.06221	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-25'	91.06221	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-25'	91.06221	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-25'	91.06221	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-25'	91.06221	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06221

none

Customer Sample Duplicate Results for Sample # 91.06221

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06221

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06222

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/15/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-30'	91.06222	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-30'	91.06222	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-30'	91.06222	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-30'	91.06222	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-30'	91.06222	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-30'	91.06222	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-30'	91.06222	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-30'	91.06222	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-30'	91.06222	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-30'	91.06222	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-30'	91.06222	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-30'	91.06222	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-30'	91.06222	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-30'	91.06222	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-30'	91.06222	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-30'	91.06222	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-30'	91.06222	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-30'	91.06222	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-30'	91.06222	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-30'	91.06222	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-30'	91.06222	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-30'	91.06222	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-30'	91.06222	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-30'	91.06222	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-30'	91.06222	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-30'	91.06222	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-30'	91.06222	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-30'	91.06222	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-30'	91.06222	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-30'	91.06222	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-30'	91.06222	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-30'	91.06222	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-30'	91.06222	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-30'	91.06222	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-30'	91.06222	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-30'	91.06222	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-30'	91.06222	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-30'	91.06222	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-30'	91.06222	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-30'	91.06222	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-30'	91.06222	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-30'	91.06222	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-30'	91.06222	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-30'	91.06222	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-30'	91.06222	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-30'	91.06222	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-30'	91.06222	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-30'	91.06222	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-30'	91.06222	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-30'	91.06222	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-30'	91.06222	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-30'	91.06222	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-30'	91.06222	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-30'	91.06222	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-30'	91.06222	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-30'	91.06222	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-30'	91.06222	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-30'	91.06222	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-30'	91.06222	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-30'	91.06222	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-30'	91.06222	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-30'	91.06222	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-30'	91.06222	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-30'	91.06222	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-30'	91.06222	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-30'	91.06222	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-30'	91.06222	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-30'	91.06222	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-30'	91.06222	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06222

none

Customer Sample Duplicate Results for Sample # 91.06222

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06222

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06223

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/16/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-40'	91.06223	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-40'	91.06223	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-40'	91.06223	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-40'	91.06223	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-40'	91.06223	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-40'	91.06223	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-40'	91.06223	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-40'	91.06223	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-40'	91.06223	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-40'	91.06223	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-40'	91.06223	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-40'	91.06223	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-40'	91.06223	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-40'	91.06223	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-40'	91.06223	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-40'	91.06223	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-40'	91.06223	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-40'	91.06223	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-40'	91.06223	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-40'	91.06223	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-40'	91.06223	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-40'	91.06223	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-40'	91.06223	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-40'	91.06223	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-40'	91.06223	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-40'	91.06223	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-40'	91.06223	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-40'	91.06223	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-40'	91.06223	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-40'	91.06223	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-40'	91.06223	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-40'	91.06223	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-40'	91.06223	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-40'	91.06223	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-40'	91.06223	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-40'	91.06223	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-40'	91.06223	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-40'	91.06223	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-40'	91.06223	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-40'	91.06223	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-40'	91.06223	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-40'	91.06223	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-40'	91.06223	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-40'	91.06223	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-40'	91.06223	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-40'	91.06223	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-40'	91.06223	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-40'	91.06223	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-40'	91.06223	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-40'	91.06223	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-40'	91.06223	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-40'	91.06223	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-40'	91.06223	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-40'	91.06223	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-40'	91.06223	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-40'	91.06223	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-40'	91.06223	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-40'	91.06223	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-40'	91.06223	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-40'	91.06223	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-40'	91.06223	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-40'	91.06223	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-40'	91.06223	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-40'	91.06223	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-40'	91.06223	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-40'	91.06223	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-40'	91.06223	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-40'	91.06223	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-40'	91.06223	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06223

none

Customer Sample Duplicate Results for Sample # 91.06223

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06223

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06224

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/16/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-50'	91.06224	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-50'	91.06224	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-50'	91.06224	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-50'	91.06224	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-50'	91.06224	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-50'	91.06224	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-50'	91.06224	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-50'	91.06224	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-50'	91.06224	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-50'	91.06224	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-50'	91.06224	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-50'	91.06224	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-50'	91.06224	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-50'	91.06224	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-50'	91.06224	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-50'	91.06224	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-50'	91.06224	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-50'	91.06224	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-50'	91.06224	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-50'	91.06224	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-50'	91.06224	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-50'	91.06224	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-50'	91.06224	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-50'	91.06224	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-50'	91.06224	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-50'	91.06224	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-50'	91.06224	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-50'	91.06224	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-50'	91.06224	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-50'	91.06224	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-50'	91.06224	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-50'	91.06224	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-50'	91.06224	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-50'	91.06224	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-50'	91.06224	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-50'	91.06224	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-50'	91.06224	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-50'	91.06224	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-50'	91.06224	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-50'	91.06224	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-50'	91.06224	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-50'	91.06224	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-50'	91.06224	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-50'	91.06224	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-50'	91.06224	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-50'	91.06224	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-50'	91.06224	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-50'	91.06224	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-50'	91.06224	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-50'	91.06224	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-50'	91.06224	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-50'	91.06224	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-50'	91.06224	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-50'	91.06224	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-50'	91.06224	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-50'	91.06224	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-50'	91.06224	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-50'	91.06224	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-50'	91.06224	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-50'	91.06224	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-50'	91.06224	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-50'	91.06224	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-50'	91.06224	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-50'	91.06224	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-50'	91.06224	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-50'	91.06224	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-50'	91.06224	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-50'	91.06224	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-50'	91.06224	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06224

none

Customer Sample Duplicate Results for Sample # 91.06224

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06224

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91,06227

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/16/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-80'	91.06227	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-80'	91.06227	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-80'	91.06227	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-80'	91.06227	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-80'	91.06227	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-80'	91.06227	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-80'	91.06227	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-80'	91.06227	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-80'	91.06227	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-80'	91.06227	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-80'	91.06227	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-80'	91.06227	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-80'	91.06227	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-80'	91.06227	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-80'	91.06227	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-80'	91.06227	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-80'	91.06227	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-80'	91.06227	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-80'	91.06227	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-80'	91.06227	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-80'	91.06227	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-80'	91.06227	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-80'	91.06227	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-80'	91.06227	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-80'	91.06227	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-80'	91.06227	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-80'	91.06227	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-80'	91.06227	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-80'	91.06227	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-80'	91.06227	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-80'	91.06227	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-80'	91.06227	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-80'	91.06227	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-80'	91.06227	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-80'	91.06227	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-80'	91.06227	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-80'	91.06227	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-80'	91.06227	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-80'	91.06227	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-80'	91.06227	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-80'	91.06227	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-80'	91.06227	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-80'	91.06227	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-80'	91.06227	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-80'	91.06227	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-80'	91.06227	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-80'	91.06227	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-80'	91.06227	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-80'	91.06227	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-80'	91.06227	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-80'	91.06227	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-80'	91.06227	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-80'	91.06227	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-80'	91.06227	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-80'	91.06227	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-80'	91.06227	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-80'	91.06227	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-80'	91.06227	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-80'	91.06227	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-80'	91.06227	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-80'	91.06227	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-80'	91.06227	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-80'	91.06227	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-80'	91.06227	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-80'	91.06227	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-80'	91.06227	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-80'	91.06227	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-80'	91.06227	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-80'	91.06227	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06227

none

Customer Sample Duplicate Results for Sample # 91.06227

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06227

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06229

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/16/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-100'	91.06229	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-100'	91.06229	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-100'	91.06229	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-100'	91.06229	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-100'	91.06229	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-100'	91.06229	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-100'	91.06229	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-100'	91.06229	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-100'	91.06229	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-100'	91.06229	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-100'	91.06229	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-100'	91.06229	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-100'	91.06229	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-100'	91.06229	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-100'	91.06229	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-100'	91.06229	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-100'	91.06229	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-100'	91.06229	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-100'	91.06229	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-100'	91.06229	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-100'	91.06229	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-100'	91.06229	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-100'	91.06229	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-100'	91.06229	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-100'	91.06229	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-100'	91.06229	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-100'	91.06229	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-100'	91.06229	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-100'	91.06229	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-100'	91.06229	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-100'	91.06229	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-100'	91.06229	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-100'	91.06229	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-100'	91.06229	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-100'	91.06229	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-100'	91.06229	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-100'	91.06229	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-100'	91.06229	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-100'	91.06229	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-100'	91.06229	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-100'	91.06229	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-100'	91.06229	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-100'	91.06229	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-100'	91.06229	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-100'	91.06229	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-100'	91.06229	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-100'	91.06229	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-100'	91.06229	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-100'	91.06229	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-100'	91.06229	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-100'	91.06229	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-100'	91.06229	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-100'	91.06229	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-100'	91.06229	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-100'	91.06229	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-100'	91.06229	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-100'	91.06229	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-100'	91.06229	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-100'	91.06229	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-100'	91.06229	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-100'	91.06229	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-100'	91.06229	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-100'	91.06229	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-100'	91.06229	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-100'	91.06229	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-100'	91.06229	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-100'	91.06229	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-100'	91.06229	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-100'	91.06229	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06229

none

Customer Sample Duplicate Results for Sample # 91.06229

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06229

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06234

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/16/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-150'	91.06234	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-150'	91.06234	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-150'	91.06234	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-150'	91.06234	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-150'	91.06234	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-150'	91.06234	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-150'	91.06234	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-150'	91.06234	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-150'	91.06234	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-150'	91.06234	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-150'	91.06234	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-150'	91.06234	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-150'	91.06234	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-150'	91.06234	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-150'	91.06234	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-150'	91.06234	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-150'	91.06234	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-150'	91.06234	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-150'	91.06234	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-150'	91.06234	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-150'	91.06234	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-150'	91.06234	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-150'	91.06234	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-150'	91.06234	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-150'	91.06234	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-150'	91.06234	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-150'	91.06234	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-150'	91.06234	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-150'	91.06234	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-150'	91.06234	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-150'	91.06234	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-150'	91.06234	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-150'	91.06234	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-150'	91.06234	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-150'	91.06234	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-150'	91.06234	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-150'	91.06234	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-150'	91.06234	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-150'	91.06234	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-150'	91.06234	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-150'	91.06234	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-150'	91.06234	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-150'	91.06234	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-150'	91.06234	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-150'	91.06234	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-150'	91.06234	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-150'	91.06234	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-150'	91.06234	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-150'	91.06234	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-150'	91.06234	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-150'	91.06234	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-150'	91.06234	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-150'	91.06234	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-150'	91.06234	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-150'	91.06234	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-150'	91.06234	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-150'	91.06234	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-150'	91.06234	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-150'	91.06234	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-150'	91.06234	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-150'	91.06234	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-150'	91.06234	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-150'	91.06234	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-150'	91.06234	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-150'	91.06234	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-150'	91.06234	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-150'	91.06234	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-150'	91.06234	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-150'	91.06234	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06234

none

Customer Sample Duplicate Results for Sample # 91.06234

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06234

none

REPORT NUMBER: 10958

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06240

Date Collected: 7/11/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/16/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-25'QA	91.06240	83329	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthene
AB-6-25'QA	91.06240	208968	< 330.		UG/KG	7/19/91	PRIORITY 1	Acenaphthylene
AB-6-25'QA	91.06240	62533	< 330.		UG/KG	7/19/91	PRIORITY 1	Aniline
AB-6-25'QA	91.06240	120127	< 330.		UG/KG	7/19/91	PRIORITY 1	Anthracene
AB-6-25'QA	91.06240	103333	< 330.		UG/KG	7/19/91	PRIORITY 1	Azobenzene
AB-6-25'QA	91.06240	92875	< 330.		UG/KG	7/19/91	PRIORITY 1	m-Benzidine
AB-6-25'QA	91.06240	56553	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]anthracene
AB-6-25'QA	91.06240	50328	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[a]pyrene
AB-6-25'QA	91.06240	205992	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[b]fluoranthene
AB-6-25'QA	91.06240	191242	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[g,h,i]perylene
AB-6-25'QA	91.06240	207089	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzo[k]fluoranthene
AB-6-25'QA	91.06240	65850	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzoic acid
AB-6-25'QA	91.06240	100516	< 330.		UG/KG	7/19/91	PRIORITY 1	Benzyl alcohol
AB-6-25'QA	91.06240	111911	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethoxy)methane
AB-6-25'QA	91.06240	111444	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroethyl)ether
AB-6-25'QA	91.06240	108601	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-chloroisopropyl)ether
AB-6-25'QA	91.06240	117817	< 330.		UG/KG	7/19/91	PRIORITY 1	Bis(2-ethylhexyl)phthalate
AB-6-25'QA	91.06240	101553	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Bromophenylphenyl ether
AB-6-25'QA	91.06240	85687	< 330.		UG/KG	7/19/91	PRIORITY 1	Butylbenzyl phthalate
AB-6-25'QA	91.06240	59507	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-25'QA	91.06240	106478	< 330.		UG/KG	7/19/91	PRIORITY 1	4-Chloroaniline

AB-6-25'QA	91.06240	91587	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Chloronaphthalene
AB-6-25'QA	91.06240	95578	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Chlorophenol
AB-6-25'QA	91.06240	7005723	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Chlorophenylphenyl ether
AB-6-25'QA	91.06240	218019	< 330.	UG/KG	7/19/91	PRIORITY 1	Chrysene
AB-6-25'QA	91.06240	84742	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-butyl phthalate
AB-6-25'QA	91.06240	117840	< 330.	UG/KG	7/19/91	PRIORITY 1	Di-n-octyl phthalate
AB-6-25'QA	91.06240	53703	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzo[a,h]anthracene
AB-6-25'QA	91.06240	132649	< 330.	UG/KG	7/19/91	PRIORITY 1	Dibenzofuran
AB-6-25'QA	91.06240	95501	< 330.	UG/KG	7/19/91	PRIORITY 1	o-Dichlorobenzene (1,2)
AB-6-25'QA	91.06240	541731	< 330.	UG/KG	7/19/91	PRIORITY 1	m-Dichlorobenzene (1,3)
AB-6-25'QA	91.06240	106467	< 330.	UG/KG	7/19/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-25'QA	91.06240	91941	< 330.	UG/KG	7/19/91	PRIORITY 1	3,3'-Dichlorobenzidine
AB-6-25'QA	91.06240	120832	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dichlorophenol
AB-6-25'QA	91.06240	84662	< 330.	UG/KG	7/19/91	PRIORITY 1	Diethyl phthalate
AB-6-25'QA	91.06240	131113	< 330.	UG/KG	7/19/91	PRIORITY 1	Dimethyl phthalate
AB-6-25'QA	91.06240	105679	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dimethylphenol
AB-6-25'QA	91.06240	51285	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrophenol
AB-6-25'QA	91.06240	121142	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-25'QA	91.06240	606202	< 330.	UG/KG	7/19/91	PRIORITY 1	2,6-Dinitrotoluene
AB-6-25'QA	91.06240	206440	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluoranthene
AB-6-25'QA	91.06240	86737	< 330.	UG/KG	7/19/91	PRIORITY 1	Fluorene
AB-6-25'QA	91.06240	118741	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobenzene
AB-6-25'QA	91.06240	87683	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorobutadiene
AB-6-25'QA	91.06240	77474	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachlorocyclopentadiene
AB-6-25'QA	91.06240	67721	< 330.	UG/KG	7/19/91	PRIORITY 1	Hexachloroethane
AB-6-25'QA	91.06240	193395	< 330.	UG/KG	7/19/91	PRIORITY 1	Indeno[1,2,3-cd]pyrene
AB-6-25'QA	91.06240	78591	< 330.	UG/KG	7/19/91	PRIORITY 1	Isophorone
AB-6-25'QA	91.06240	534521	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methyl-4,6-dinitrophenol
AB-6-25'QA	91.06240	91576	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylnaphthalene
AB-6-25'QA	91.06240	95487	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Methylphenol
AB-6-25'QA	91.06240	106445	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Methylphenol
AB-6-25'QA	91.06240	91203	< 330.	UG/KG	7/19/91	PRIORITY 1	Naphthalene
AB-6-25'QA	91.06240	88744	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitroaniline
AB-6-25'QA	91.06240	99092	< 330.	UG/KG	7/19/91	PRIORITY 1	3-Nitroaniline
AB-6-25'QA	91.06240	100016	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitroaniline
AB-6-25'QA	91.06240	98953	< 330.	UG/KG	7/19/91	PRIORITY 1	Nitrobenzene
AB-6-25'QA	91.06240	88755	< 330.	UG/KG	7/19/91	PRIORITY 1	2-Nitrophenol
AB-6-25'QA	91.06240	100027	< 330.	UG/KG	7/19/91	PRIORITY 1	4-Nitrophenol
AB-6-25'QA	91.06240	621647	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-25'QA	91.06240	62759	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodimethylamine
AB-6-25'QA	91.06240	86306	< 330.	UG/KG	7/19/91	PRIORITY 1	N-Nitrosodiphenylamine
AB-6-25'QA	91.06240	87865	< 330.	UG/KG	7/19/91	PRIORITY 1	Pentachlorophenol
AB-6-25'QA	91.06240	85018	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenanthrene
AB-6-25'QA	91.06240	108952	< 330.	UG/KG	7/19/91	PRIORITY 1	Phenol
AB-6-25'QA	91.06240	129000	< 330.	UG/KG	7/19/91	PRIORITY 1	Pyrene

AB-6-25'QA	91.06240	120821	< 330.	UG/KG	7/19/91	PRIORITY 1	1,2,4-Trichlorobenzene
AB-6-25'QA	91.06240	95954	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,5-Trichlorophenol
AB-6-25'QA	91.06240	88062	< 330.	UG/KG	7/19/91	PRIORITY 1	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.06240

none

Customer Sample Duplicate Results for Sample # 91.06240

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06240

none

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REPORT NUMBER: 10958 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT **********

Prepared by: LAT on 19-Jul-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11696 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only Blind QC samples run with this batch.

____ No QC samples run with this sample batch.

____ No QC samples for this constituent and matrix type available within HSE-9

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

Blank Results

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUN
00.20227	91.06400	83329	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Acenaphthene
00.20227	91.06400	208968	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Acenaphthylene
00.20227	91.06400	62533	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Aniline
00.20227	91.06400	120127	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Anthracene
00.20227	91.06400	103333	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Azobenzene
00.20227	91.06400	92875	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	m-Benzidine
00.20227	91.06400	56553	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[a]anthracene
00.20227	91.06400	50328	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[a]pyrene
00.20227	91.06400	205992	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[b]fluoranthene
00.20227	91.06400	191242	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[g,h,i]perylene
00.20227	91.06400	207089	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[k]fluoranthene
00.20227	91.06400	65850	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Benzoic acid
00.20227	91.06400	100516	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Benzyl alcohol
00.20227	91.06400	111911	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-chloroethoxy)methane
00.20227	91.06400	111444	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-chloroethyl)ether
00.20227	91.06400	108601	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-chloroisopropyl)ether
00.20227	91.06400	117817	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-ethylhexyl)phthalate
00.20227	91.06400	101553	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	4-Bromophenylphenyl ether
00.20227	91.06400	85687	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Butylbenzyl phthalate
00.20227	91.06400	59507	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	4-Chloro-3-methylphenol
00.20227	91.06400	106478	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	4-Chloroaniline
00.20227	91.06400	91587	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	2-Chloronaphthalene
00.20227	91.06400	95578	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	o-Chlorophenol
00.20227	91.06400	7005723	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	4-Chlorophenylphenyl ether
00.20227	91.06400	218019	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Chrysene
00.20227	91.06400	84742	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Di-n-butyl phthalate
00.20227	91.06400	117840	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Di-n-octyl phthalate
00.20227	91.06400	53703	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Dibenzo[a,h]anthracene
00.20227	91.06400	132649	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	Dibenzofuran
00.20227	91.06400	95501	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
00.20227	91.06400	541731	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
00.20227	91.06400	106467	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
00.20227	91.06400	91941	< 330.		UG/KG	0.0		7/19/91	UNDER CONTROL	3,3'-Dichlorobenzidine

00.20227	91.06400	120832	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2,4-Dichlorophenol
00.20227	91.06400	84662	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Diethyl phthalate
00.20227	91.06400	131113	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Dimethyl phthalate
00.20227	91.06400	105679	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2,4-Dimethylphenol
00.20227	91.06400	51285	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2,4-Dinitrophenol
00.20227	91.06400	121142	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2,4-Dinitrotoluene
00.20227	91.06400	606202	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2,6-Dinitrotoluene
00.20227	91.06400	206440	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Fluoranthene
00.20227	91.06400	86737	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Fluorene
00.20227	91.06400	118741	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Hexachlorobenzene
00.20227	91.06400	87683	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Hexachlorobutadiene
00.20227	91.06400	77474	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Hexachlorocyclopentadiene
00.20227	91.06400	67721	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Hexachloroethane
00.20227	91.06400	193395	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Indeno[1,2,3-cd]pyrene
00.20227	91.06400	78591	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Isophorone
00.20227	91.06400	534521	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2-Methyl-4,6-dinitrophenol
00.20227	91.06400	91576	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2-Methylnaphthalene
00.20227	91.06400	95487	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2-Methylphenol
00.20227	91.06400	106445	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	4-Methylphenol
00.20227	91.06400	91203	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Naphthalene
00.20227	91.06400	88744	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2-Nitroaniline
00.20227	91.06400	99092	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	3-Nitroaniline
00.20227	91.06400	100016	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	4-Nitroaniline
00.20227	91.06400	98953	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Nitrobenzene
00.20227	91.06400	88755	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2-Nitrophenol
00.20227	91.06400	100027	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	4-Nitrophenol
00.20227	91.06400	621647	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	N-Nitrosodi-n-propylamine
00.20227	91.06400	62759	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	N-Nitrosodimethylamine
00.20227	91.06400	86306	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	N-Nitrosodiphenylamine
00.20227	91.06400	87865	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Pentachlorophenol
00.20227	91.06400	85018	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Phenanthrene
00.20227	91.06400	108952	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Phenol
00.20227	91.06400	129000	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	Pyrene
00.20227	91.06400	120821	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	1,2,4-Trichlorobenzene
00.20227	91.06400	95954	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2,4,5-Trichlorophenol
00.20227	91.06400	88062	< 330.	UG/KG	0.0	7/19/91	UNDER CONTROL	2,4,6-Trichlorophenol

Blank Spike Results

none

Blank Spike Duplicate Results

none

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

Blind QC Results, Sample # 91.06399

Date Collected: 7/10/91 Date Received: 7/12/91 Date Extracted: 7/15/91 Date Analyzed: 7/16/91

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
91.06399	83329	2.9	0.87	MG/KG	4.7	0.5	7/19/91	UNDER CONTROL	Acenaphthene
91.06399	208968	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Acenaphthylene
91.06399	62533	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Aniline
91.06399	120127	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Anthracene
91.06399	103333	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Azobenzene
91.06399	92875	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	m-Benzidine
91.06399	56553	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[a]anthracene
91.06399	50328	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[a]pyrene
91.06399	205992	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[b]fluoranthene
91.06399	191242	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[g,h,i]perylene
91.06399	207089	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[k]fluoranthene
91.06399	65850	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzoic acid
91.06399	100516	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzyl alcohol
91.06399	111911	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-chloroethoxy)methane
91.06399	111444	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-chloroethyl)ether
91.06399	108601	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-chloroisopropyl)ether
91.06399	117817	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-ethylhexyl)phthalate
91.06399	101553	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Bromophenylphenyl ether
91.06399	85687	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Butylbenzyl phthalate
91.06399	59507	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Chloro-3-methylphenol
91.06399	106478	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Chloroaniline
91.06399	91587	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Chloronaphthalene
91.06399	95578	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	o-Chlorophenol
91.06399	7005723	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Chlorophenylphenyl ether
91.06399	218019	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Chrysene
91.06399	84742	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Di-n-butyl phthalate
91.06399	117840	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Di-n-octyl phthalate
91.06399	53703	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Dibenzo[a,h]anthracene
91.06399	132649	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Dibenzofuran
91.06399	95501	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
91.06399	541731	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
91.06399	106467	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
91.06399	91941	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	3,3'-Dichlorobenzidine

91.06399	120832	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4-Dichlorophenol
91.06399	84662	3.1	0.93	MG/KG	4.5	0.4	7/19/91	UNDER CONTROL	Diethyl phthalate
91.06399	131113	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Dimethyl phthalate
91.06399	105679	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4-Dimethylphenol
91.06399	51285	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4-Dinitrophenol
91.06399	121142	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4-Dinitrotoluene
91.06399	606202	3.2	0.96	MG/KG	4.7	0.5	7/19/91	UNDER CONTROL	2,6-Dinitrotoluene
91.06399	206440	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Fluoranthene
91.06399	86737	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Fluorene
91.06399	118741	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Hexachlorobenzene
91.06399	87683	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Hexachlorobutadiene
91.06399	77474	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Hexachlorocyclopentadiene
91.06399	67721	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Hexachloroethane
91.06399	193395	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Indeno[1,2,3-cd]pyrene
91.06399	78591	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Isophorone
91.06399	534521	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Methyl-4,6-dinitrophenol
91.06399	91576	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Methylnaphthalene
91.06399	95487	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Methylphenol
91.06399	106445	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Methylphenol
91.06399	91203	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Naphthalene
91.06399	88744	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Nitroaniline
91.06399	99092	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	3-Nitroaniline
91.06399	100016	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Nitroaniline
91.06399	98953	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Nitrobenzene
91.06399	88755	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Nitrophenol
91.06399	100027	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Nitrophenol
91.06399	621647	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	N-Nitrosodi-n-propylamine
91.06399	62759	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	N-Nitrosodimethylamine
91.06399	86306	3.4	1.02	MG/KG	4.4	0.4	7/19/91	UNDER CONTROL	N-Nitrosodiphenylamine
91.06399	87865	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Pentachlorophenol
91.06399	85018	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Phenanthrene
91.06399	108952	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Phenol
91.06399	129000	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Pyrene
91.06399	120821	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	1,2,4-Trichlorobenzene
91.06399	95954	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4,5-Trichlorophenol
91.06399	88062	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4,6-Trichlorophenol

SURROGATE RESULTS FOR EPA SEMIVOLATILES

Surrogate 1 = 2-Fluorophenol (CAS # = 367124)
Surrogate 2 = Phenol-d5 (CAS # = 4165622)
Surrogate 3 = Nitrobenzene-d5 (CAS # = 4165600)
Surrogate 4 = 2-Fluorobiphenyl (CAS # = 321608)
Surrogate 5 = 2,4,6-Tribromophenol (CAS # = 118796)
Surrogate 6 = p-Terphenyl-d14 (CAS # =)

SAMPLE NUMBER	UNITS	Surrogate 1	Surrogate 2	Surrogate 3	Surrogate 4	Surrogate 5	Surrogate 6	COMPLETION DATE
91.06217	%	54.75	63.55	57.08	62.88	79.19	84.7	19-Jul-1991
91.06217	%	5.33	19.84	4.24	29.64	75.8	81.3	19-Jul-1991
91.06217	%	59.02	66.49	57.7	62.9	66.68	86.18	19-Jul-1991
91.06218	%	60.12	66.66	58.54	68.08	66.45	88.64	19-Jul-1991
91.06219	%	57.97	68.48	58.92	66.5	70.89	81.7	19-Jul-1991
91.06220	%	60.29	67.92	57.46	66.78	63.36	76.8	19-Jul-1991
91.06221	%	65.27	72.14	63.7	72.56	69.85	79.82	19-Jul-1991
91.06222	%	21.13	25.32	17.3	29.6	37.19	47.5	19-Jul-1991
91.06223	%	70.21	74.49	67.08	75.72	70.37	84.28	19-Jul-1991
91.06224	%	52.13	58.54	50.08	61.26	65.31	71.42	19-Jul-1991
91.06227	%	44.24	50.72	35.66	56.02	53.28	79.68	19-Jul-1991
91.06229	%	60.72	68.92	57.8	71.16	69.79	83.32	19-Jul-1991
91.06234	%	67.41	73.64	65.	74.84	71.33	86.96	19-Jul-1991
91.06240	%	41.73	52.24	35.42	57.62	56.3	67.42	19-Jul-1991
91.06399	%	60.77	74.08	63.16	72.94	58.89	86.78	19-Jul-1991
91.06400	%	58.14	63.88	56.92	64.36	59.99	82.88	19-Jul-1991

EPA Limits:							
Water	%	21 - 100	10 - 94	35 - 114	43 - 116	10 - 123	33 - 141
Soil	%	25 - 121	24 - 113	23 - 120	30 - 115	19 - 122	18 - 137

REPORT NUMBER: 10958

Analyst	Reviewer	Section Leader	QA Officer
7/22/91	7-22-91		
Date	Date	Date	Date

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.

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Tritium Analysis Data
for
Borehole 6

REPORT NUMBER: 10995

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: DK on 23-Jul-1991

ANALYSIS: H-3 REQUEST NUMBER: 11698 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-6-60'	91.06225	900.	300.	PCI/L	7/23/91	
AB-6-120'	91.06231	600.	300.	PCI/L	7/23/91	
AB-6-130'	91.06232	0.0	300.	PCI/L	7/23/91	

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REPORT NUMBER: 10995 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: DK on 23-Jul-1991

REQUEST NUMBER: 11698 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only 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 HSE-9

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 HSE-9

REPORT NUMBER: 10995			
	[illegible]	D Kuch	mag
	Analyst	Section Leader	QA Officer
	24 Jul, 91	7-24-91	7/24/91
	Date	Date	Date

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

Gravimetric Moisture Analysis Data
for
Borehole 6

REPORT NUMBER: 11049

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: B BATES on 24-Jul-1991

ANALYSIS: H2O REQUEST NUMBER: 11698 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-6-60'	91.06225	5.56	0.56	%	7/24/91	
AB-6-120'	91.06231	8.6	0.86	%	7/24/91	
AB-6-130'	91.06232	10.3	1.	%	7/24/91	

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REPORT NUMBER: 11049 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: B BATES on 24-Jul-1991

REQUEST NUMBER: 11698 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only 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 HSE-9

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 HSE-9

REPORT NUMBER: 11049	RJP	D Knol	mag
	Analyst	Section Leader	QA Officer
	24 July 91	7-24-91	7/24/91
	Date	Date	Date

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

Tritium Analysis Data
for
Borehole 7

REPORT NUMBER: 10952

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: DK on 19-Jul-1991

ANALYSIS: H-3 REQUEST NUMBER: 11731 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-7-0'	91.06578	1200.	300.	PCI/L	7/19/91	
AB-7-5'	91.06579	2000.	300.	PCI/L	7/19/91	
AB-7-5'QA	91.06580	1000.	300.	PCI/L	7/19/91	
AB-7-10'	91.06581	700.	300.	PCI/L	7/19/91	
AB-7-15'	91.06582	900.	300.	PCI/L	7/19/91	
AB-7-20'	91.06583	1100.	300.	PCI/L	7/19/91	
AB-7-25'	91.06584	900.	300.	PCI/L	7/19/91	
AB-7-30'	91.06585	800.	300.	PCI/L	7/19/91	
AB-7-40'	91.06586	900.	300.	PCI/L	7/19/91	
AB-7-50'	91.06587	900.	300.	PCI/L	7/19/91	
AB-7-60'	91.06588	700.	300.	PCI/L	7/19/91	
AB-7-70'	91.06589	900.	300.	PCI/L	7/19/91	
AB-7-80'	91.06590	600.	300.	PCI/L	7/19/91	
AB-7-35'	91.06591	900.	300.	PCI/L	7/19/91	

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REPORT NUMBER: 10952 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: DK on 19-Jul-1991

REQUEST NUMBER: 11731 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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
00.22385	500.	300.	PCI/L	0.0		7/19/91	UNDER CONTROL
00.22386	16000.	1000.	PCI/L	18430.	370.	7/19/91	WARNING 2-3 SIG

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
91.06592	4.	0.4	NCI/L	3.56	0.09	7/19/91	UNDER CONTROL

REPORT NUMBER: 10952

Analyst	Section Leader	QA Officer
	D Kinnel	mag
19 Jul 91	7-19-91	7-19-91
Date	Date	Date

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.

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Gravimetric Moisture Analysis Data
for
Borehole 7
(Cores)

REPORT NUMBER: 10949

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: B BATES on 18-Jul-1991

ANALYSIS: H2O- REQUEST NUMBER: 11731 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

ANALYTICAL TECHNIQUE: LS ANALYTICAL PROCEDURE:

CUSTOMER SAMPLES:

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
AB-7-0'	91.06578	3.23	0.32	%	7/18/91	
AB-7-5'	91.06579	2.71	0.27	%	7/18/91	
AB-7-5'QA	91.06580	2.7	0.27	%	7/18/91	
AB-7-10'	91.06581	3.79	0.38	%	7/18/91	
AB-7-15'	91.06582	3.31	0.33	%	7/18/91	
AB-7-20'	91.06583	19.2	1.9	%	7/18/91	
AB-7-25'	91.06584	8.87	0.89	%	7/18/91	
AB-7-30'	91.06585	20.	2.	%	7/18/91	
AB-7-40'	91.06586	9.09	0.91	%	7/18/91	
AB-7-50'	91.06587	12.4	1.2	%	7/18/91	
AB-7-60'	91.06588	15.8	1.6	%	7/18/91	
AB-7-70'	91.06589	14.9	1.5	%	7/18/91	
AB-7-80'	91.06590	16.	1.6	%	7/18/91	
AB-7-35'	91.06591	17.6	1.8	%	7/18/91	

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REPORT NUMBER: 10949 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: B BATES on 18-Jul-1991

REQUEST NUMBER: 11731 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only 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 HSE-9

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
91.06592	4.58	0.46	%	4.76	0.4	7/18/91	UNDER CONTROL

REPORT NUMBER: 10949

RJP — Analyst — 19 Jul 91 — Date

[illegible] — Section Leader — 7-19-91 — Date

mag — QA Officer — 7-19-91 — Date

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.

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Volatile Organic Analysis Data
for
Borehole 7

TO: Alice Barr, HSE-8

FROM: Suzanne Ehart Bell, HSE-9 Organic Analysis Section

THRU: Chris Leibman
Laura Tsiagkouris

DATE: July 30, 1991

REQUEST: 11777

The following samples were received for volatile organic analysis using SW846 purge and trap method 8260:

91.07037 91.07038 91.07039

These samples were received as core tubes in plastic bags. Approximately 5 gms of the soil was added to 5 ml of water for heated purge and trap analysis.

Since the sample results are not blank subtracted, a copy of the method blank results have been included with this report. The 14 day holding time requirement was met.

Results:

No target compounds were detected in any of the samples. Because these were priority 1 samples, the customer was given a preliminary verbal report by phone as soon as work was completed.

QC Summary:

All matrix spikes were within control limits. A "blind" QC sample was analyzed with this batch of samples and the results of this analysis are included with this report. One of the surrogate recoveries was slightly above control limits on this sample, but all other surrogate recoveries were within control limits.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

	SPIKE REC.	SPIKE-DUP REC.	SPIKE % REC.	SPIKE-DUP % REC.	RPD	LOW. CONT. REC. LIM.	UP. CONT. REC. LIM.	RPD LIM.
1,1-Dichloroethene	59	61	96%	101%	5%	59	172	22
Benzene	56	57	92%	94%	2%	66	142	21
Trichloroethene	55	57	91%	94%	4%	62	137	24
Toluene	57	58	94%	96%	2%	59	139	21
Chlorobenzene	54	52	89%	86%	4%	60	133	21

* If % Matrix Recovery is Followed by a "*", it is out of QC Limits.

Reviewed By:

VM 8/1/91

SB 7-31-91

SURROGATE RECOVERIES

PROJECT #: [illegible]

NUMBER OF SAMPLES: 8
MATRIX: S
ANALYST: BCC
DATE: 08/01/91

SURROGATE RECOVERIES

SURROGATE RECOVERIES IN PERCENT (%)

	SAMPLE NUMBERS	TYPE	1,2-Dichloroethane-D4	Dibromofluoromethane (S3)	4-Bromofluorobenzene
1	SR1.07042	BLANK	98	98	93
2	SR1.07037	SAMPLE	99	97	94
3	SR1.07038	SAMPLE	95	96	95
4	SR1.07039	SAMPLE	99	99	93
5	SR1.07040	SAMPLE	93	95	95
6	*R1.07039	MATRIX SPIK	105	99	94
7	SR1.07039	MATRIX SP-D	103	97	94
8	SR1.07041	SAMPLE	101 *	97	95
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
Average % Surrogate Recovery...			100	97	93
Defined Lower QC Limits (%)....			70	81	74
Defined Upper QC Limits (%)....			121	117	121
Observed Lower QC Limits (%)...			88	95	93
Observed Upper QC Limits (%)...			121	99	95

8-1-91
Corrected.

* If % Surrogate Recovery is Followed by a "*", it is out of QC Limits.

Reviewed By:

8/1/91

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA VOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Suzanne Bell PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.07037

Date Collected: 7/16/91 Date Received: 7/23/91 Date Extracted: 7/24/91 Date Analyzed: 7/24/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-7-5'	91.07037	67641	< 20.		UG/KG	8/01/91		Acetone
AB-7-5'	91.07037	107028	< 100.		UG/KG	8/01/91		Acrolein
AB-7-5'	91.07037	107131	< 100.		UG/KG	8/01/91		Acrylonitrile
AB-7-5'	91.07037	71432	< 5.		UG/KG	8/01/91		Benzene
AB-7-5'	91.07037	108861	< 5.		UG/KG	8/01/91		Bromobenzene
AB-7-5'	91.07037	74975	< 5.		UG/KG	8/01/91		Bromochloromethane
AB-7-5'	91.07037	75274	< 5.		UG/KG	8/01/91		Bromodichloromethane
AB-7-5'	91.07037	75252	< 5.		UG/KG	8/01/91		Bromoform
AB-7-5'	91.07037	74839	< 10.		UG/KG	8/01/91		Bromomethane
AB-7-5'	91.07037	78933	< 20.		UG/KG	8/01/91		2-Butanone
AB-7-5'	91.07037	104518	< 5.		UG/KG	8/01/91		n-Butylbenzene
AB-7-5'	91.07037	135988	< 5.		UG/KG	8/01/91		sec-Butylbenzene
AB-7-5'	91.07037	98066	< 5.		UG/KG	8/01/91		tert-Butylbenzene
AB-7-5'	91.07037	75150	< 5.		UG/KG	8/01/91		Carbon disulfide
AB-7-5'	91.07037	56235	< 5.		UG/KG	8/01/91		Carbon tetrachloride
AB-7-5'	91.07037	108907	< 5.		UG/KG	8/01/91		Chlorobenzene
AB-7-5'	91.07037	124481	< 5.		UG/KG	8/01/91		Chlorodibromomethane
AB-7-5'	91.07037	75003	< 10.		UG/KG	8/01/91		Chloroethane
AB-7-5'	91.07037	110758	< 50.		UG/KG	8/01/91		2-Chloroethylvinyl ether
AB-7-5'	91.07037	67663	< 5.		UG/KG	8/01/91		Chloroform
AB-7-5'	91.07037	74873	< 10.		UG/KG	8/01/91		Chloromethane

AB-7-5'	91.07037	95498	< 5.	UG/KG	/91	o-Chlorotoluene
AB-7-5'	91.07037	106434	< 5.	UG/KG	/91	p-Chlorotoluene
AB-7-5'	91.07037	96128	< 10.	UG/KG	8/01/91	1,2-Dibromo-3-chloropropane
AB-7-5'	91.07037	106934	< 5.	UG/KG	8/01/91	1,2-Dibromoethane
AB-7-5'	91.07037	74953	< 5.	UG/KG	8/01/91	Dibromomethane
AB-7-5'	91.07037	95501	< 5.	UG/KG	8/01/91	o-Dichlorobenzene (1,2)
AB-7-5'	91.07037	541731	< 5.	UG/KG	8/01/91	m-Dichlorobenzene (1,3)
AB-7-5'	91.07037	106467	< 5.	UG/KG	8/01/91	p-Dichlorobenzene (1,4)
AB-7-5'	91.07037	75718	< 10.	UG/KG	8/01/91	Dichlorodifluoromethane
AB-7-5'	91.07037	75343	< 5.	UG/KG	8/01/91	1,1-Dichloroethane
AB-7-5'	91.07037	107062	< 5.	UG/KG	8/01/91	1,2-Dichloroethane
AB-7-5'	91.07037	75354	< 5.	UG/KG	8/01/91	1,1-Dichloroethene
AB-7-5'	91.07037	156605	< 5.	UG/KG	8/01/91	trans-1,2-Dichloroethene
AB-7-5'	91.07037	156592	< 5.	UG/KG	8/01/91	cis-1,2-Dichloroethylene
AB-7-5'	91.07037	78875	< 5.	UG/KG	8/01/91	1,2-Dichloropropane
AB-7-5'	91.07037	142289	< 5.	UG/KG	8/01/91	1,3-Dichloropropane
AB-7-5'	91.07037	594207	< 5.	UG/KG	8/01/91	2,2-Dichloropropane
AB-7-5'	91.07037	563586	< 5.	UG/KG	8/01/91	1,1-Dichloropropene
AB-7-5'	91.07037	10061015	< 5.	UG/KG	8/01/91	cis-1,3-Dichloropropene
AB-7-5'	91.07037	10061026	< 5.	UG/KG	8/01/91	trans-1,3-Dichloropropene
AB-7-5'	91.07037	100414	< 5.	UG/KG	8/01/91	Ethylbenzene
AB-7-5'	91.07037	591786	< 20.	UG/KG	8/01/91	2-Hexanone
AB-7-5'	91.07037	98828	< 5.	UG/KG	8/01/91	Isopropylbenzene
AB-7-5'	91.07037	99876	< 5.	UG/KG	8/01/91	4-Isopropyltoluene
AB-7-5'	91.07037	74884	< 5.	UG/KG	8/01/91	Methyl iodide
AB-7-5'	91.07037	108101	< 20.	UG/KG	8/01/91	4-Methyl-2-pentanone
AB-7-5'	91.07037	75092	< 5.	UG/KG	8/01/91	Methylene chloride
AB-7-5'	91.07037	103651	< 5.	UG/KG	8/01/91	Propylbenzene
AB-7-5'	91.07037	100425	< 5.	UG/KG	8/01/91	Styrene
AB-7-5'	91.07037	630206	< 5.	UG/KG	8/01/91	1,1,1,2-Tetrachloroethane
AB-7-5'	91.07037	79345	< 5.	UG/KG	8/01/91	1,1,2,2-Tetrachloroethane
AB-7-5'	91.07037	127184	< 5.	UG/KG	8/01/91	Tetrachloroethylene
AB-7-5'	91.07037	108883	< 5.	UG/KG	8/01/91	Toluene
AB-7-5'	91.07037	76131	< 5.	UG/KG	8/01/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-7-5'	91.07037	71556	< 5.	UG/KG	8/01/91	1,1,1-Trichloroethane
AB-7-5'	91.07037	79005	< 5.	UG/KG	8/01/91	1,1,2-Trichloroethane
AB-7-5'	91.07037	79016	< 5.	UG/KG	8/01/91	Trichloroethene
AB-7-5'	91.07037	75694	< 5.	UG/KG	8/01/91	Trichlorofluoromethane
AB-7-5'	91.07037	96184	< 5.	UG/KG	8/01/91	1,2,3-Trichloropropane
AB-7-5'	91.07037	95636	< 5.	UG/KG	8/01/91	1,2,4-Trimethylbenzene
AB-7-5'	91.07037	108678	< 5.	UG/KG	8/01/91	1,3,5-Trimethylbenzene
AB-7-5'	91.07037	108054	< 10.	UG/KG	8/01/91	Vinyl acetate
AB-7-5'	91.07037	75014	< 10.	UG/KG	8/01/91	Vinyl chloride
AB-7-5'	91.07037	1330207	< 5.	UG/KG	8/01/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.07037

none

Customer Sample Duplicate Results for Sample # 91.07037

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.07037

none

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA VOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Suzanne Bell PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.07038

Date Collected: 7/16/91 Date Received: 7/23/91 Date Extracted: 7/24/91 Date Analyzed: 7/24/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-7-20'	91.07038	67641	< 20.		UG/KG	8/01/91		Acetone
AB-7-20'	91.07038	107028	< 100.		UG/KG	8/01/91		Acrolein
AB-7-20'	91.07038	107131	< 100.		UG/KG	8/01/91		Acrylonitrile
AB-7-20'	91.07038	71432	< 5.		UG/KG	8/01/91		Benzene
AB-7-20'	91.07038	108861	< 5.		UG/KG	8/01/91		Bromobenzene
AB-7-20'	91.07038	74975	< 5.		UG/KG	8/01/91		Bromochloromethane
AB-7-20'	91.07038	75274	< 5.		UG/KG	8/01/91		Bromodichloromethane
AB-7-20'	91.07038	75252	< 5.		UG/KG	8/01/91		Bromoform
AB-7-20'	91.07038	74839	< 10.		UG/KG	8/01/91		Bromomethane
AB-7-20'	91.07038	78933	< 20.		UG/KG	8/01/91		2-Butanone
AB-7-20'	91.07038	104518	< 5.		UG/KG	8/01/91		n-Butylbenzene
AB-7-20'	91.07038	135988	< 5.		UG/KG	8/01/91		sec-Butylbenzene
AB-7-20'	91.07038	98066	< 5.		UG/KG	8/01/91		tert-Butylbenzene
AB-7-20'	91.07038	75150	< 5.		UG/KG	8/01/91		Carbon disulfide
AB-7-20'	91.07038	56235	< 5.		UG/KG	8/01/91		Carbon tetrachloride
AB-7-20'	91.07038	108907	< 5.		UG/KG	8/01/91		Chlorobenzene
AB-7-20'	91.07038	124481	< 5.		UG/KG	8/01/91		Chlorodibromomethane
AB-7-20'	91.07038	75003	< 10.		UG/KG	8/01/91		Chloroethane
AB-7-20'	91.07038	110758	< 50.		UG/KG	8/01/91		2-Chloroethylvinyl ether
AB-7-20'	91.07038	67663	< 5.		UG/KG	8/01/91		Chloroform
AB-7-20'	91.07038	74873	< 10.		UG/KG	8/01/91		Chloromethane

AB-7-20	91.07038	95498	< 5.	UG/KG	/91	o-Chlorotoluene
AB-7-20	91.07038	106434	< 5.	UG/KG	1/91	p-Chlorotoluene
AB-7-20'	91.07038	96128	< 10.	UG/KG	8/01/91	1,2-Dibromo-3-chloropropane
AB-7-20'	91.07038	106934	< 5.	UG/KG	8/01/91	1,2-Dibromoethane
AB-7-20'	91.07038	74953	< 5.	UG/KG	8/01/91	Dibromomethane
AB-7-20'	91.07038	95501	< 5.	UG/KG	8/01/91	o-Dichlorobenzene (1,2)
AB-7-20'	91.07038	541731	< 5.	UG/KG	8/01/91	m-Dichlorobenzene (1,3)
AB-7-20'	91.07038	106467	< 5.	UG/KG	8/01/91	p-Dichlorobenzene (1,4)
AB-7-20'	91.07038	75718	< 10.	UG/KG	8/01/91	Dichlorodifluoromethane
AB-7-20'	91.07038	75343	< 5.	UG/KG	8/01/91	1,1-Dichloroethane
AB-7-20'	91.07038	107062	< 5.	UG/KG	8/01/91	1,2-Dichloroethane
AB-7-20'	91.07038	75354	< 5.	UG/KG	8/01/91	1,1-Dichloroethene
AB-7-20'	91.07038	156605	< 5.	UG/KG	8/01/91	trans-1,2-Dichloroethene
AB-7-20'	91.07038	156592	< 5.	UG/KG	8/01/91	cis-1,2-Dichloroethylene
AB-7-20'	91.07038	78875	< 5.	UG/KG	8/01/91	1,2-Dichloropropane
AB-7-20'	91.07038	142289	< 5.	UG/KG	8/01/91	1,3-Dichloropropane
AB-7-20'	91.07038	594207	< 5.	UG/KG	8/01/91	2,2-Dichloropropane
AB-7-20'	91.07038	563586	< 5.	UG/KG	8/01/91	1,1-Dichloropropene
AB-7-20'	91.07038	10061015	< 5.	UG/KG	8/01/91	cis-1,3-Dichloropropene
AB-7-20'	91.07038	10061026	< 5.	UG/KG	8/01/91	trans-1,3-Dichloropropene
AB-7-20'	91.07038	100414	< 5.	UG/KG	8/01/91	Ethylbenzene
AB-7-20'	91.07038	591786	< 20.	UG/KG	8/01/91	2-Hexanone
AB-7-20'	91.07038	98828	< 5.	UG/KG	8/01/91	Isopropylbenzene
AB-7-20'	91.07038	99876	< 5.	UG/KG	8/01/91	4-Isopropyltoluene
AB-7-20'	91.07038	74884	< 5.	UG/KG	8/01/91	Methyl iodide
AB-7-20'	91.07038	108101	< 20.	UG/KG	8/01/91	4-Methyl-2-pentanone
AB-7-20'	91.07038	75092	< 5.	UG/KG	8/01/91	Methylene chloride
AB-7-20'	91.07038	103651	< 5.	UG/KG	8/01/91	Propylbenzene
AB-7-20'	91.07038	100425	< 5.	UG/KG	8/01/91	Styrene
AB-7-20'	91.07038	630206	< 5.	UG/KG	8/01/91	1,1,1,2-Tetrachloroethane
AB-7-20'	91.07038	79345	< 5.	UG/KG	8/01/91	1,1,2,2-Tetrachloroethane
AB-7-20'	91.07038	127184	< 5.	UG/KG	8/01/91	Tetrachloroethylene
AB-7-20'	91.07038	108883	< 5.	UG/KG	8/01/91	Toluene
AB-7-20'	91.07038	76131	< 5.	UG/KG	8/01/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-7-20'	91.07038	71556	< 5.	UG/KG	8/01/91	1,1,1-Trichloroethane
AB-7-20'	91.07038	79005	< 5.	UG/KG	8/01/91	1,1,2-Trichloroethane
AB-7-20'	91.07038	79016	< 5.	UG/KG	8/01/91	Trichloroethene
AB-7-20'	91.07038	75694	< 5.	UG/KG	8/01/91	Trichlorofluoromethane
AB-7-20'	91.07038	96184	< 5.	UG/KG	8/01/91	1,2,3-Trichloropropane
AB-7-20'	91.07038	95636	< 5.	UG/KG	8/01/91	1,2,4-Trimethylbenzene
AB-7-20'	91.07038	108678	< 5.	UG/KG	8/01/91	1,3,5-Trimethylbenzene
AB-7-20'	91.07038	108054	< 10.	UG/KG	8/01/91	Vinyl acetate
AB-7-20'	91.07038	75014	< 10.	UG/KG	8/01/91	Vinyl chloride
AB-7-20'	91.07038	1330207	< 5.	UG/KG	8/01/91	Mixed-Xylenes (o ± m ± p)

Tentati[illegible]dentified Compounds in Customer Sample # 91.07038

none

Customer Sample Duplicate Results for Sample # 91.07038

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.07038

none

REPORT [illegible]: 11146

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA VOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Suzanne Bell PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91,07039

Date Collected: 7/16/91 Date Received: 7/23/91 Date Extracted: 7/24/91 Date Analyzed: 7/24/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-7-80'	91.07039	67641	< 20.		UG/KG	8/01/91		Acetone
AB-7-80'	91.07039	107028	< 100.		UG/KG	8/01/91		Acrolein
AB-7-80'	91.07039	107131	< 100.		UG/KG	8/01/91		Acrylonitrile
AB-7-80'	91.07039	71432	< 5.		UG/KG	8/01/91		Benzene
AB-7-80'	91.07039	108861	< 5.		UG/KG	8/01/91		Bromobenzene
AB-7-80'	91.07039	74975	< 5.		UG/KG	8/01/91		Bromochloromethane
AB-7-80'	91.07039	75274	< 5.		UG/KG	8/01/91		Bromodichloromethane
AB-7-80'	91.07039	75252	< 5.		UG/KG	8/01/91		Bromoform
AB-7-80'	91.07039	74839	< 10.		UG/KG	8/01/91		Bromomethane
AB-7-80'	91.07039	78933	< 20.		UG/KG	8/01/91		2-Butanone
AB-7-80'	91.07039	104518	< 5.		UG/KG	8/01/91		n-Butylbenzene
AB-7-80'	91.07039	135988	< 5.		UG/KG	8/01/91		sec-Butylbenzene
AB-7-80'	91.07039	98066	< 5.		UG/KG	8/01/91		tert-Butylbenzene
AB-7-80'	91.07039	75150	< 5.		UG/KG	8/01/91		Carbon disulfide
AB-7-80'	91.07039	56235	< 5.		UG/KG	8/01/91		Carbon tetrachloride
AB-7-80'	91.07039	108907	< 5.		UG/KG	8/01/91		Chlorobenzene
AB-7-80'	91.07039	124481	< 5.		UG/KG	8/01/91		Chlorodibromomethane
AB-7-80'	91.07039	75003	< 10.		UG/KG	8/01/91		Chloroethane
AB-7-80'	91.07039	110758	< 50.		UG/KG	8/01/91		2-Chloroethylvinyl ether
AB-7-80'	91.07039	67663	< 5.		UG/KG	8/01/91		Chloroform
AB-7-80'	91.07039	74873	< 10.		UG/KG	8/01/91		Chloromethane

AB-7-80	91.07039	95498	< 5.	UG/KG	/91	o-Chlorotoluene
AB-7-80	91.07039	106434	< 5.	UG/KG	/91	p-Chlorotoluene
AB-7-80'	91.07039	96128	< 10.	UG/KG	8/01/91	1,2-Dibromo-3-chloropropane
AB-7-80'	91.07039	106934	< 5.	UG/KG	8/01/91	1,2-Dibromoethane
AB-7-80'	91.07039	74953	< 5.	UG/KG	8/01/91	Dibromomethane
AB-7-80'	91.07039	95501	< 5.	UG/KG	8/01/91	o-Dichlorobenzene (1,2)
AB-7-80'	91.07039	541731	< 5.	UG/KG	8/01/91	m-Dichlorobenzene (1,3)
AB-7-80'	91.07039	106467	< 5.	UG/KG	8/01/91	p-Dichlorobenzene (1,4)
AB-7-80'	91.07039	75718	< 10.	UG/KG	8/01/91	Dichlorodifluoromethane
AB-7-80'	91.07039	75343	< 5.	UG/KG	8/01/91	1,1-Dichloroethane
AB-7-80'	91.07039	107062	< 5.	UG/KG	8/01/91	1,2-Dichloroethane
AB-7-80'	91.07039	75354	< 5.	UG/KG	8/01/91	1,1-Dichloroethene
AB-7-80'	91.07039	156605	< 5.	UG/KG	8/01/91	trans-1,2-Dichloroethene
AB-7-80'	91.07039	156592	< 5.	UG/KG	8/01/91	cis-1,2-Dichloroethylene
AB-7-80'	91.07039	78875	< 5.	UG/KG	8/01/91	1,2-Dichloropropane
AB-7-80'	91.07039	142289	< 5.	UG/KG	8/01/91	1,3-Dichloropropane
AB-7-80'	91.07039	594207	< 5.	UG/KG	8/01/91	2,2-Dichloropropane
AB-7-80'	91.07039	563586	< 5.	UG/KG	8/01/91	1,1-Dichloropropene
AB-7-80'	91.07039	10061015	< 5.	UG/KG	8/01/91	cis-1,3-Dichloropropene
AB-7-80'	91.07039	10061026	< 5.	UG/KG	8/01/91	trans-1,3-Dichloropropene
AB-7-80'	91.07039	100414	< 5.	UG/KG	8/01/91	Ethylbenzene
AB-7-80'	91.07039	591786	< 20.	UG/KG	8/01/91	2-Hexanone
AB-7-80'	91.07039	98828	< 5.	UG/KG	8/01/91	Isopropylbenzene
AB-7-80'	91.07039	99876	< 5.	UG/KG	8/01/91	4-Isopropyltoluene
AB-7-80'	91.07039	74884	< 5.	UG/KG	8/01/91	Methyl iodide
AB-7-80'	91.07039	108101	< 20.	UG/KG	8/01/91	4-Methyl-2-pentanone
AB-7-80'	91.07039	75092	< 5.	UG/KG	8/01/91	Methylene chloride
AB-7-80'	91.07039	103651	< 5.	UG/KG	8/01/91	Propylbenzene
AB-7-80'	91.07039	100425	< 5.	UG/KG	8/01/91	Styrene
AB-7-80'	91.07039	630206	< 5.	UG/KG	8/01/91	1,1,1,2-Tetrachloroethane
AB-7-80'	91.07039	79345	< 5.	UG/KG	8/01/91	1,1,2,2-Tetrachloroethane
AB-7-80'	91.07039	127184	< 5.	UG/KG	8/01/91	Tetrachloroethylene
AB-7-80'	91.07039	108883	< 5.	UG/KG	8/01/91	Toluene
AB-7-80'	91.07039	76131	< 5.	UG/KG	8/01/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-7-80'	91.07039	71556	< 5.	UG/KG	8/01/91	1,1,1-Trichloroethane
AB-7-80'	91.07039	79005	< 5.	UG/KG	8/01/91	1,1,2-Trichloroethane
AB-7-80'	91.07039	79016	< 5.	UG/KG	8/01/91	Trichloroethene
AB-7-80'	91.07039	75694	< 5.	UG/KG	8/01/91	Trichlorofluoromethane
AB-7-80'	91.07039	96184	< 5.	UG/KG	8/01/91	1,2,3-Trichloropropane
AB-7-80'	91.07039	95636	< 5.	UG/KG	8/01/91	1,2,4-Trimethylbenzene
AB-7-80'	91.07039	108678	< 5.	UG/KG	8/01/91	1,3,5-Trimethylbenzene
AB-7-80'	91.07039	108054	< 10.	UG/KG	8/01/91	Vinyl acetate
AB-7-80'	91.07039	75014	< 10.	UG/KG	8/01/91	Vinyl chloride
AB-7-80'	91.07039	1330207	< 5.	UG/KG	8/01/91	Mixed-Xylenes (o ± m ± p)

Tentatively Identified Compounds in Customer Sample # 91.07039

none

Customer Sample Duplicate Results for Sample # 91.07039

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.07039

none

Matrix Spike Results for Sample # 91.07039

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-7-80'	91.07039	71432	60.68	56.	UG/KG	8/01/91		Benzene
AB-7-80'	91.07039	108907	60.68	54.	UG/KG	8/01/91		Chlorobenzene
AB-7-80'	91.07039	75343	60.68	58.	UG/KG	8/01/91		1,1-Dichloroethane
AB-7-80'	91.07039	108883	60.68	57.	UG/KG	8/01/91		Toluene
AB-7-80'	91.07039	79016	60.68	55.	UG/KG	8/01/91		Trichloroethene

Matrix Spike Duplicate Results for Sample # 91.07039

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-7-80'	91.07039	71432	60.68	57.	UG/KG	8/01/91		Benzene
AB-7-80'	91.07039	108907	60.68	52.	UG/KG	8/01/91		Chlorobenzene
AB-7-80'	91.07039	75343	60.68	61.	UG/KG	8/01/91		1,1-Dichloroethane
AB-7-80'	91.07039	108883	60.68	58.	UG/KG	8/01/91		Toluene
AB-7-80'	91.07039	79016	60.68	57.	UG/KG	8/01/91		Trichloroethene

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA VOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Suzanne Bell PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91,07040

Date Collected: 7/16/91 Date Received: 7/23/91 Date Extracted: 7/24/91 Date Analyzed: 7/24/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-7-TB	91.07040	67641	< 20.		UG/KG	8/01/91		Acetone
AB-7-TB	91.07040	107028	< 100.		UG/KG	8/01/91		Acrolein
AB-7-TB	91.07040	107131	< 100.		UG/KG	8/01/91		Acrylonitrile
AB-7-TB	91.07040	71432	< 5.		UG/KG	8/01/91		Benzene
AB-7-TB	91.07040	108861	< 5.		UG/KG	8/01/91		Bromobenzene
AB-7-TB	91.07040	74975	< 5.		UG/KG	8/01/91		Bromochloromethane
AB-7-TB	91.07040	75274	< 5.		UG/KG	8/01/91		Bromodichloromethane
AB-7-TB	91.07040	75252	< 5.		UG/KG	8/01/91		Bromoform
AB-7-TB	91.07040	74839	< 10.		UG/KG	8/01/91		Bromomethane
AB-7-TB	91.07040	78933	< 20.		UG/KG	8/01/91		2-Butanone
AB-7-TB	91.07040	104518	< 5.		UG/KG	8/01/91		n-Butylbenzene
AB-7-TB	91.07040	135988	< 5.		UG/KG	8/01/91		sec-Butylbenzene
AB-7-TB	91.07040	98066	< 5.		UG/KG	8/01/91		tert-Butylbenzene
AB-7-TB	91.07040	75150	< 5.		UG/KG	8/01/91		Carbon disulfide
AB-7-TB	91.07040	56235	< 5.		UG/KG	8/01/91		Carbon tetrachloride
AB-7-TB	91.07040	108907	< 5.		UG/KG	8/01/91		Chlorobenzene
AB-7-TB	91.07040	124481	< 5.		UG/KG	8/01/91		Chlorodibromomethane
AB-7-TB	91.07040	75003	< 10.		UG/KG	8/01/91		Chloroethane
AB-7-TB	91.07040	110758	< 50.		UG/KG	8/01/91		2-Chloroethylvinyl ether
AB-7-TB	91.07040	67663	< 5.		UG/KG	8/01/91		Chloroform
AB-7-TB	91.07040	74873	< 10.		UG/KG	8/01/91		Chloromethane

AB-7-TB	91.07040	95498	< 5.	UG/KG	/91	o-Chlorotoluene
AB-7-TB	91.07040	106434	< 5.	UG/KG	1/91	p-Chlorotoluene
AB-7-TB	91.07040	96128	< 10.	UG/KG	8/01/91	1,2-Dibromo-3-chloropropane
AB-7-TB	91.07040	106934	< 5.	UG/KG	8/01/91	1,2-Dibromoethane
AB-7-TB	91.07040	74953	< 5.	UG/KG	8/01/91	Dibromomethane
AB-7-TB	91.07040	95501	< 5.	UG/KG	8/01/91	o-Dichlorobenzene (1,2)
AB-7-TB	91.07040	541731	< 5.	UG/KG	8/01/91	m-Dichlorobenzene (1,3)
AB-7-TB	91.07040	106467	< 5.	UG/KG	8/01/91	p-Dichlorobenzene (1,4)
AB-7-TB	91.07040	75718	< 10.	UG/KG	8/01/91	Dichlorodifluoromethane
AB-7-TB	91.07040	75343	< 5.	UG/KG	8/01/91	1,1-Dichloroethane
AB-7-TB	91.07040	107062	< 5.	UG/KG	8/01/91	1,2-Dichloroethane
AB-7-TB	91.07040	75354	< 5.	UG/KG	8/01/91	1,1-Dichloroethene
AB-7-TB	91.07040	156605	< 5.	UG/KG	8/01/91	trans-1,2-Dichloroethene
AB-7-TB	91.07040	156592	< 5.	UG/KG	8/01/91	cis-1,2-Dichloroethylene
AB-7-TB	91.07040	78875	< 5.	UG/KG	8/01/91	1,2-Dichloropropane
AB-7-TB	91.07040	142289	< 5.	UG/KG	8/01/91	1,3-Dichloropropane
AB-7-TB	91.07040	594207	< 5.	UG/KG	8/01/91	2,2-Dichloropropane
AB-7-TB	91.07040	563586	< 5.	UG/KG	8/01/91	1,1-Dichloropropene
AB-7-TB	91.07040	10061015	< 5.	UG/KG	8/01/91	cis-1,3-Dichloropropene
AB-7-TB	91.07040	10061026	< 5.	UG/KG	8/01/91	trans-1,3-Dichloropropene
AB-7-TB	91.07040	100414	< 5.	UG/KG	8/01/91	Ethylbenzene
AB-7-TB	91.07040	591786	< 20.	UG/KG	8/01/91	2-Hexanone
AB-7-TB	91.07040	98828	< 5.	UG/KG	8/01/91	Isopropylbenzene
AB-7-TB	91.07040	99876	< 5.	UG/KG	8/01/91	4-Isopropyltoluene
AB-7-TB	91.07040	74884	< 5.	UG/KG	8/01/91	Methyl iodide
AB-7-TB	91.07040	108101	< 20.	UG/KG	8/01/91	4-Methyl-2-pentanone
AB-7-TB	91.07040	75092	< 5.	UG/KG	8/01/91	Methylene chloride
AB-7-TB	91.07040	103651	< 5.	UG/KG	8/01/91	Propylbenzene
AB-7-TB	91.07040	100425	< 5.	UG/KG	8/01/91	Styrene
AB-7-TB	91.07040	630206	< 5.	UG/KG	8/01/91	1,1,1,2-Tetrachloroethane
AB-7-TB	91.07040	79345	< 5.	UG/KG	8/01/91	1,1,2,2-Tetrachloroethane
AB-7-TB	91.07040	127184	< 5.	UG/KG	8/01/91	Tetrachloroethylene
AB-7-TB	91.07040	108883	< 5.	UG/KG	8/01/91	Toluene
AB-7-TB	91.07040	76131	< 5.	UG/KG	8/01/91	1,1,2-Trichloro-1,2,2-trifluoroethane
AB-7-TB	91.07040	71556	< 5.	UG/KG	8/01/91	1,1,1-Trichloroethane
AB-7-TB	91.07040	79005	< 5.	UG/KG	8/01/91	1,1,2-Trichloroethane
AB-7-TB	91.07040	79016	< 5.	UG/KG	8/01/91	Trichloroethene
AB-7-TB	91.07040	75694	< 5.	UG/KG	8/01/91	Trichlorofluoromethane
AB-7-TB	91.07040	96184	< 5.	UG/KG	8/01/91	1,2,3-Trichloropropane
AB-7-TB	91.07040	95636	< 5.	UG/KG	8/01/91	1,2,4-Trimethylbenzene
AB-7-TB	91.07040	108678	< 5.	UG/KG	8/01/91	1,3,5-Trimethylbenzene
AB-7-TB	91.07040	108054	< 10.	UG/KG	8/01/91	Vinyl acetate
AB-7-TB	91.07040	75014	< 10.	UG/KG	8/01/91	Vinyl chloride
AB-7-TB	91.07040	1330207	< 5.	UG/KG	8/01/91	Mixed-Xylenes (o ± m ± p)

Tentati[illegible]dentified Compounds in Customer Sample # 91.07040

none

Customer Sample Duplicate Results for Sample # 91.07040

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.07040

none

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********** HSE-9 QUALITY ASSURANCE REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA VOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Suzanne Bell PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only Blind QC samples run with this batch.

____ No QC samples run with this sample batch.

____ No QC samples for this constituent and matrix type available within HSE-9

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

Blank Results

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUN
00.20227	91.07042	67641	< 20.		UG/KG	0.0		8/01/91	UNDER CONTROL	Acetone
00.20227	91.07042	107028	< 100.		UG/KG	0.0		8/01/91	UNDER CONTROL	Acrolein
00.20227	91.07042	107131	< 100.		UG/KG	0.0		8/01/91	UNDER CONTROL	Acrylonitrile
00.20227	91.07042	71432	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Benzene
00.20227	91.07042	108861	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Bromobenzene
00.20227	91.07042	74975	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Bromochloromethane
00.20227	91.07042	75274	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Bromodichloromethane
00.20227	91.07042	75252	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Bromoform
00.20227	91.07042	74839	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Bromomethane
00.20227	91.07042	78933	< 20.		UG/KG	0.0		8/01/91	UNDER CONTROL	2-Butanone
00.20227	91.07042	104518	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	n-Butylbenzene
00.20227	91.07042	135988	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	sec-Butylbenzene
00.20227	91.07042	98066	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	tert-Butylbenzene
00.20227	91.07042	75150	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Carbon disulfide
00.20227	91.07042	56235	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Carbon tetrachloride
00.20227	91.07042	108907	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Chlorobenzene
00.20227	91.07042	124481	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Chlorodibromomethane
00.20227	91.07042	75003	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Chloroethane
00.20227	91.07042	110758	< 50.		UG/KG	0.0		8/01/91	UNDER CONTROL	2-Chloroethylvinyl ether
00.20227	91.07042	67663	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Chloroform
00.20227	91.07042	74873	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Chloromethane
00.20227	91.07042	95498	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	o-Chlorotoluene
00.20227	91.07042	106434	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	p-Chlorotoluene
00.20227	91.07042	96128	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,2-Dibromo-3-chloropropane
00.20227	91.07042	106934	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,2-Dibromoethane
00.20227	91.07042	74953	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Dibromomethane
00.20227	91.07042	95501	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
00.20227	91.07042	541731	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
00.20227	91.07042	106467	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
00.20227	91.07042	75718	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Dichlorodifluoromethane
00.20227	91.07042	75343	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,1-Dichloroethane
00.20227	91.07042	107062	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,2-Dichloroethane
00.20227	91.07042	75354	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,1-Dichloroethene

00.20227	91.07042	156605	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	trans-1,2-D[illegible]ethene
00.20227	91.07042	156592	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	cis-1,2-Dich[illegible]thylene
00.20227	91.07042	78875	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,2-Dichloropropane
00.20227	91.07042	142289	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,3-Dichloropropane
00.20227	91.07042	594207	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	2,2-Dichloropropane
00.20227	91.07042	563586	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,1-Dichloropropene
00.20227	91.07042	10061015	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	cis-1,3-Dichloropropene
00.20227	91.07042	10061026	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	trans-1,3-Dichloropropene
00.20227	91.07042	100414	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Ethylbenzene
00.20227	91.07042	591786	< 20.	UG/KG	0.0	8/01/91	UNDER CONTROL	2-Hexanone
00.20227	91.07042	98828	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Isopropylbenzene
00.20227	91.07042	99876	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	4-Isopropyltoluene
00.20227	91.07042	74884	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Methyl iodide
00.20227	91.07042	108101	< 20.	UG/KG	0.0	8/01/91	UNDER CONTROL	4-Methyl-2-pentanone
00.20227	91.07042	75092	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Methylene chloride
00.20227	91.07042	103651	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Propylbenzene
00.20227	91.07042	100425	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Styrene
00.20227	91.07042	630206	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,1,1,2-Tetrachloroethane
00.20227	91.07042	79345	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,1,2,2-Tetrachloroethane
00.20227	91.07042	127184	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Tetrachloroethylene
00.20227	91.07042	108883	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Toluene
00.20227	91.07042	76131	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,1,2-Trichloro-1,2,2-trifluoroet
00.20227	91.07042	71556	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,1,1-Trichloroethane
00.20227	91.07042	79005	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,1,2-Trichloroethane
00.20227	91.07042	79016	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Trichloroethene
00.20227	91.07042	75694	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Trichlorofluoromethane
00.20227	91.07042	96184	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,2,3-Trichloropropane
00.20227	91.07042	95636	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,2,4-Trimethylbenzene
00.20227	91.07042	108678	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	1,3,5-Trimethylbenzene
00.20227	91.07042	108054	< 10.	UG/KG	0.0	8/01/91	UNDER CONTROL	Vinyl acetate
00.20227	91.07042	75014	< 10.	UG/KG	0.0	8/01/91	UNDER CONTROL	Vinyl chloride
00.20227	91.07042	1330207	< 5.	UG/KG	0.0	8/01/91	UNDER CONTROL	Mixed-Xylenes (o ± m ± p)

Blank Spike Results

none

Blank Spike Duplicate Results

none

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

Blind C lts, Sample # 91.07041

Date Collected: 7/23/91 Date Received: 7/23/91 Date Extracted: 7/24/91 Date Analyzed: 7/24/91

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
91.07041	67641	53.	15.9	UG/KG	150.	15.	8/01/91	OUT OF CONTROL	Acetone
91.07041	107028	< 100.		UG/KG	0.0		8/01/91	UNDER CONTROL	Acrolein
91.07041	107131	< 100.		UG/KG	0.0		8/01/91	UNDER CONTROL	Acrylonitrile
91.07041	71432	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Benzene
91.07041	108861	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Bromobenzene
91.07041	74975	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Bromochloromethane
91.07041	75274	110.	33.	UG/KG	120.	12.	8/01/91	UNDER CONTROL	Bromodichloromethane
91.07041	75252	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Bromoform
91.07041	74839	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Bromomethane
91.07041	78933	55.	16.5	UG/KG	150.	15.	8/01/91	OUT OF CONTROL	2-Butanone
91.07041	104518	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	n-Butylbenzene
91.07041	135988	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	sec-Butylbenzene
91.07041	98066	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	tert-Butylbenzene
91.07041	75150	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Carbon disulfide
91.07041	56235	140.	42.	UG/KG	120.	12.	8/01/91	UNDER CONTROL	Carbon tetrachloride
91.07041	108907	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Chlorobenzene
91.07041	124481	160.	48.	UG/KG	160.	16.	8/01/91	UNDER CONTROL	Chlorodibromomethane
91.07041	75003	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Chloroethane
91.07041	110758	< 50.		UG/KG	0.0		8/01/91	UNDER CONTROL	2-Chloroethylvinyl ether
91.07041	67663	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Chloroform
91.07041	74873	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Chloromethane
91.07041	95498	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	o-Chlorotoluene
91.07041	106434	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	p-Chlorotoluene
91.07041	96128	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,2-Dibromo-3-chloropropane
91.07041	106934	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,2-Dibromoethane
91.07041	74953	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Dibromomethane
91.07041	95501	110.	33.	UG/KG	120.	12.	8/01/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
91.07041	541731	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
91.07041	106467	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
91.07041	75718	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Dichlorodifluoromethane
91.07041	75343	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,1-Dichloroethane
91.07041	107062	160.	48.	UG/KG	150.	15.	8/01/91	UNDER CONTROL	1,2-Dichloroethane
91.07041	75354	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,1-Dichloroethene
91.07041	156605	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	trans-1,2-Dichloroethene
91.07041	156592	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	cis-1,2-Dichloroethylene
91.07041	78875	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,2-Dichloropropane
91.07041	142289	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,3-Dichloropropane

91.0704[illegible]	[illegible]94207	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	2,2-Dichloropropan[illegible]
91.07041	563586	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,1-Dichloropropene
91.07041	10061015	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	cis-1,3-Dichloropropene
91.07041	10061026	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	trans-1,3-Dichloropropene
91.07041	100414	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Ethylbenzene
91.07041	591786	< 20.		UG/KG	0.0		8/01/91	UNDER CONTROL	2-Hexanone
91.07041	98828	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Isopropylbenzene
91.07041	99876	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	4-Isopropyltoluene
91.07041	74884	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Methyl iodide
91.07041	108101	120.	36.	UG/KG	160.	16.	8/01/91	UNDER CONTROL	4-Methyl-2-pentanone
91.07041	75092	160.	48.	UG/KG	170.	17.	8/01/91	UNDER CONTROL	Methylene chloride
91.07041	103651	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Propylbenzene
91.07041	100425	110.	33.	UG/KG	130.	13.	8/01/91	UNDER CONTROL	Styrene
91.07041	630206	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,1,1,2-Tetrachloroethane
91.07041	79345	110.	33.	UG/KG	130.	13.	8/01/91	UNDER CONTROL	1,1,2,2-Tetrachloroethane
91.07041	127184	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Tetrachloroethylene
91.07041	108883	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Toluene
91.07041	76131	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,1,2-Trichloro-1,2,2-trifluoroethane
91.07041	71556	160.	48.	UG/KG	150.	15.	8/01/91	UNDER CONTROL	1,1,1-Trichloroethane
91.07041	79005	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,1,2-Trichloroethane
91.07041	79016	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Trichloroethene
91.07041	75694	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Trichlorofluoromethane
91.07041	96184	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,2,3-Trichloropropane
91.07041	95636	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,2,4-Trimethylbenzene
91.07041	108678	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	1,3,5-Trimethylbenzene
91.07041	108054	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Vinyl acetate
91.07041	75014	< 10.		UG/KG	0.0		8/01/91	UNDER CONTROL	Vinyl chloride
91.07041	1330207	< 5.		UG/KG	0.0		8/01/91	UNDER CONTROL	Mixed-Xylenes (o ± m ± p)

SURROGATE RESULTS FOR EPA VOLATILES

Surrogate 1 = 1,2-Dichloroethane d4 (CAS # = 17060070)
Surrogate 2 = Toluene d8 (CAS # = 2037265)
Surrogate 3 = 4-Bromofluorobenzene (CAS # = 460004)

SAMPLE NUMBER	UNITS	Surrogate 1	Surrogate 2	Surrogate 3	COMPLETION DATE
91.07037	%	98.84	87.22	93.86	1-Aug-1991
91.07038	%	98.02	85.86	92.02	1-Aug-1991
91.07039	%	104.58	89.42	93.72	1-Aug-1991
91.07039	%	100.32	87.18	94.28	1-Aug-1991
91.07039	%	98.58	87.56	93.28	1-Aug-1991
91.07040	%	92.96	85.32	92.42	1-Aug-1991
91.07041	%	121.24	86.92	95.44	1-Aug-1991

91.07		88.42	88.1	92.38	1-Aug-1991

EPA Limits:

Water	%	76 - 114	88 - 110	86 - 115
Soil	%	70 - 121	81 - 117	74 - 121

REPORT NUMBER: 11146

Analyst	Reviewer	Section Leader	QA Officer
8/2/91	8/2/91	8/2/91	8/2/91
Date	Date	Date	Date

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.

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Semivolatile Organic Analysis Data
for
Borehole 7

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY AND ENVIRONMENT DIVISION
HSE-9
SURROGATE RECOVERIES FOR SEMI-VOLATILES
IN SOIL TYPE MATRICES

REQUEST #: 11777

NUMBER OF SAMPLES: 7
MATRIX S
ANALYST: MWK
Date: 08/01/91

SURROGATE RECOVERIES

SURROGATE
RECOVERIES IN PERCENT (%)

	SAMPLE NUMBERS	TYPE	2-FLUORO-PHENOL	PHENOL (D6)	NITRO-BENZENE (D5)	2-FLUORO-BIPHENYL	2,4,6-TRIBROMO-PHENOL	TERPHENYL (D14)
1	S91.07037	SAMPLE	66	78	67	76	67	87
2	S91.07038	SAMPLE	57	72	60	68	70	81
3	S91.07039	SAMPLE	66	83	69	77	73	89
4	B91.07045	BLANK	65	79	67	77	74	84
5	S91.06399	SAMPLE	61	74	63	73	59	87
6	M91.06217	MATRIX SPIK	55	64	57	63	79	85
7	D91.06217	MATRIX SP-D	5 *	20 *	4 *	30 *	76	81
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Average % Surrogate Recovery...	53	67	55	66	71	85
Defined Lower QC Limits (%)....	23	24	23	30	19	18
Defined Upper QC Limits (%)....	121	113	120	115	122	137
Observed Lower QC Limits (%)...	5	20	4	30	59	81
Observed Upper QC Limits (%)...	66	83	69	77	79	89

If % Surrogate Recovery is Followed by a "*", it is out of QC Limits.

Reviewed By:

8/2/91

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY AND ENVIRONMENT DIVISION
HSE-9
MATRIX SPIKE RECOVERIES FOR SEMI-VOLATILES

		DRY WT/VOL (G or L)	AMOUNT SPIKED IN UG/KG ACIDS	BASES	LOQ (UG/KG)
REQUEST #:	11777				
NUMBER OF SAMPLES:	7				
SPIKE ID: (STARTS M OR E)	M91.06217	SPIKE 26.582	3762	1861	330
SPIKE DUP ID: (STARTS D OR F)	D91.06217	SPIKE-DUP26.346	3796	1898	330
RAW DATA WITH:	11696				
ANALYST:	MWK				

	SPIKE REC.	SPIKE-DUP REC.	SPIKE % REC.	SPIKE-DUP % REC.	RPD	LOW. REC. LIM.	UPP. REC. LIM.	RPD LIM.
PHENOL	2400	740	64%	19%*	106%*	26	90	35
2-CHLOROPHENOL	1100	430	29%	11%*	88%*	25	102	50
1,4-DICHLOROBENZENE	1100	<LOQ	58%	0%*	200%*	28	104	27
N-NITROSO-DI-N-PROPYLAMINE	1100	<LOQ	58%	0%*	200%*	41	126	38
1,2,4-TRICLOROBENZENE	1100	<LOQ	58%	0%*	200%*	38	107	23
4-CHLORO-3-METHYLPHENOL	2500	2300	66%	61%	9%	26	103	33
ACENAPHTHENE	1200	770	64%	41%	45%*	31	137	19
4-NITROPHENOL	2400	2200	64%	58%	10%	11	114	50
2,4-DINITROTOLUENE	1300	1200	69%	63%	9%	28	89	47
PENTACHLOROPHENOL	3200	3300	85%	87%	2%	17	109	47
PYRENE	1600	1600	85%	84%	1%	35	142	36

"*" If % Matrix Recovery is Followed by a "*", it is out of QC Limits.

Reviewed By: 8/2/91

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.06217

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME

Tentatively Identified Compounds in Customer Sample # 91.06217

none

Customer Sample Duplicate Results for Sample # 91.06217

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.06217

none

Matrix Spike Results for Sample # 91.06217

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-5'	91.06217	83329	1880.94	1200.	UG/KG	8/02/91	PRIORITY 1	Acenaphthene
AB-6-5'	91.06217	59507	3761.87	2500.	UG/KG	8/02/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-5'	91.06217	95578	3761.87	1100.	UG/KG	8/02/91	PRIORITY 1	o-Chlorophenol
AB-6-5'	91.06217	106467	1880.94	1100.	UG/KG	8/02/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-5'	91.06217	121142	1880.94	1300.	UG/KG	8/02/91	PRIORITY 1	2,4-Dinitrotoluene

AB-6-5'	91.06217	100027	3761.87	2400.	UG/KG	8/02/91	PRIORITY 1	4-Nitrophenol
AB-6-5'	91.06217	621647	1880.94	1100.	UG/KG	8/02/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-5'	91.06217	87865	3761.87	3200.	UG/KG	8/02/91	PRIORITY 1	Pentachlorophenol
AB-6-5'	91.06217	108952	3761.87	2400.	UG/KG	8/02/91	PRIORITY 1	Phenol
AB-6-5'	91.06217	129000	1880.94	1600.	UG/KG	8/02/91	PRIORITY 1	Pyrene
AB-6-5'	91.06217	120821	1880.94	1100.	UG/KG	8/02/91	PRIORITY 1	1,2,4-Trichlorobenzene

Matrix Spike Duplicate Results for Sample # 91.06217

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	AMOUNT SPIKED	AMOUNT RECOVERED	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-6-5'	91.06217	83329	1897.8	770.	UG/KG	8/02/91	PRIORITY 1	Acenaphthene
AB-6-5'	91.06217	59507	3795.61	2300.	UG/KG	8/02/91	PRIORITY 1	4-Chloro-3-methylphenol
AB-6-5'	91.06217	95578	3795.61	430.	UG/KG	8/02/91	PRIORITY 1	o-Chlorophenol
AB-6-5'	91.06217	106467	1897.8	330.	UG/KG	8/02/91	PRIORITY 1	p-Dichlorobenzene (1,4)
AB-6-5'	91.06217	121142	1897.8	1200.	UG/KG	8/02/91	PRIORITY 1	2,4-Dinitrotoluene
AB-6-5'	91.06217	100027	3795.61	2200.	UG/KG	8/02/91	PRIORITY 1	4-Nitrophenol
AB-6-5'	91.06217	621647	1897.8	330.	UG/KG	8/02/91	PRIORITY 1	N-Nitrosodi-n-propylamine
AB-6-5'	91.06217	87865	3795.61	3300.	UG/KG	8/02/91	PRIORITY 1	Pentachlorophenol
AB-6-5'	91.06217	108952	3795.61	740.	UG/KG	8/02/91	PRIORITY 1	Phenol
AB-6-5'	91.06217	129000	1897.8	1600.	UG/KG	8/02/91	PRIORITY 1	Pyrene
AB-6-5'	91.06217	120821	1897.8	330.	UG/KG	8/02/91	PRIORITY 1	1,2,4-Trichlorobenzene

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.07037

Date Collected: 7/16/91 Date Received: 7/23/91 Date Extracted: 7/25/91 Date Analyzed: 7/25/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-7-5'	91.07037	83329	< 330.		UG/KG	8/02/91		Acenaphthene
AB-7-5'	91.07037	208968	< 330.		UG/KG	8/02/91		Acenaphthylene
AB-7-5'	91.07037	62533	< 330.		UG/KG	8/02/91		Aniline
AB-7-5'	91.07037	120127	< 330.		UG/KG	8/02/91		Anthracene
AB-7-5'	91.07037	103333	< 330.		UG/KG	8/02/91		Azobenzene
AB-7-5'	91.07037	92875	< 330.		UG/KG	8/02/91		m-Benzidine
AB-7-5'	91.07037	56553	< 330.		UG/KG	8/02/91		Benzo[a]anthracene
AB-7-5'	91.07037	50328	< 330.		UG/KG	8/02/91		Benzo[a]pyrene
AB-7-5'	91.07037	205992	< 330.		UG/KG	8/02/91		Benzo[b]fluoranthene
AB-7-5'	91.07037	191242	< 330.		UG/KG	8/02/91		Benzo[g,h,i]perylene
AB-7-5'	91.07037	207089	< 330.		UG/KG	8/02/91		Benzo[k]fluoranthene
AB-7-5'	91.07037	65850	< 330.		UG/KG	8/02/91		Benzoic acid
AB-7-5'	91.07037	100516	< 330.		UG/KG	8/02/91		Benzyl alcohol
AB-7-5'	91.07037	111911	< 330.		UG/KG	8/02/91		Bis(2-chloroethoxy)methane
AB-7-5'	91.07037	111444	< 330.		UG/KG	8/02/91		Bis(2-chloroethyl)ether
AB-7-5'	91.07037	108601	< 330.		UG/KG	8/02/91		Bis(2-chloroisopropyl)ether
AB-7-5'	91.07037	117817	< 330.		UG/KG	8/02/91		Bis(2-ethylhexyl)phthalate
AB-7-5'	91.07037	101553	< 330.		UG/KG	8/02/91		4-Bromophenylphenyl ether
AB-7-5'	91.07037	85687	< 330.		UG/KG	8/02/91		Butylbenzyl phthalate
AB-7-5'	91.07037	59507	< 330.		UG/KG	8/02/91		4-Chloro-3-methylphenol
AB-7-5'	91.07037	106478	< 330.		UG/KG	8/02/91		4-Chloroaniline

AB-7-5'	91.07037	91587	< 330.	UG/KG	/91	2-Chloronaphthalene
AB-7-5'	91.07037	95578	< 330.	UG/KG	/91	o-Chlorophenol
AB-7-5'	91.07037	7005723	< 330.	UG/KG	8/02/91	4-Chlorophenylphenyl ether
AB-7-5'	91.07037	218019	< 330.	UG/KG	8/02/91	Chrysene
AB-7-5'	91.07037	84742	< 330.	UG/KG	8/02/91	Di-n-butyl phthalate
AB-7-5'	91.07037	117840	< 330.	UG/KG	8/02/91	Di-n-octyl phthalate
AB-7-5'	91.07037	53703	< 330.	UG/KG	8/02/91	Dibenzo[a,h]anthracene
AB-7-5'	91.07037	132649	< 330.	UG/KG	8/02/91	Dibenzofuran
AB-7-5'	91.07037	95501	< 330.	UG/KG	8/02/91	o-Dichlorobenzene (1,2)
AB-7-5'	91.07037	541731	< 330.	UG/KG	8/02/91	m-Dichlorobenzene (1,3)
AB-7-5'	91.07037	106467	< 330.	UG/KG	8/02/91	p-Dichlorobenzene (1,4)
AB-7-5'	91.07037	91941	< 330.	UG/KG	8/02/91	3,3'-Dichlorobenzidine
AB-7-5'	91.07037	120832	< 330.	UG/KG	8/02/91	2,4-Dichlorophenol
AB-7-5'	91.07037	84662	< 330.	UG/KG	8/02/91	Diethyl phthalate
AB-7-5'	91.07037	131113	< 330.	UG/KG	8/02/91	Dimethyl phthalate
AB-7-5'	91.07037	105679	< 330.	UG/KG	8/02/91	2,4-Dimethylphenol
AB-7-5'	91.07037	51285	< 330.	UG/KG	8/02/91	2,4-Dinitrophenol
AB-7-5'	91.07037	121142	< 330.	UG/KG	8/02/91	2,4-Dinitrotoluene
AB-7-5'	91.07037	606202	< 330.	UG/KG	8/02/91	2,6-Dinitrotoluene
AB-7-5'	91.07037	206440	< 330.	UG/KG	8/02/91	Fluoranthene
AB-7-5'	91.07037	86737	< 330.	UG/KG	8/02/91	Fluorene
AB-7-5'	91.07037	118741	< 330.	UG/KG	8/02/91	Hexachlorobenzene
AB-7-5'	91.07037	87683	< 330.	UG/KG	8/02/91	Hexachlorobutadiene
AB-7-5'	91.07037	77474	< 330.	UG/KG	8/02/91	Hexachlorocyclopentadiene
AB-7-5'	91.07037	67721	< 330.	UG/KG	8/02/91	Hexachloroethane
AB-7-5'	91.07037	193395	< 330.	UG/KG	8/02/91	Indeno[1,2,3-cd]pyrene
AB-7-5'	91.07037	78591	< 330.	UG/KG	8/02/91	Isophorone
AB-7-5'	91.07037	534521	< 330.	UG/KG	8/02/91	2-Methyl-4,6-dinitrophenol
AB-7-5'	91.07037	91576	< 330.	UG/KG	8/02/91	2-Methylnaphthalene
AB-7-5'	91.07037	95487	< 330.	UG/KG	8/02/91	2-Methylphenol
AB-7-5'	91.07037	106445	< 330.	UG/KG	8/02/91	4-Methylphenol
AB-7-5'	91.07037	91203	< 330.	UG/KG	8/02/91	Naphthalene
AB-7-5'	91.07037	88744	< 330.	UG/KG	8/02/91	2-Nitroaniline
AB-7-5'	91.07037	99092	< 330.	UG/KG	8/02/91	3-Nitroaniline
AB-7-5'	91.07037	100016	< 330.	UG/KG	8/02/91	4-Nitroaniline
AB-7-5'	91.07037	98953	< 330.	UG/KG	8/02/91	Nitrobenzene
AB-7-5'	91.07037	88755	< 330.	UG/KG	8/02/91	2-Nitrophenol
AB-7-5'	91.07037	100027	< 330.	UG/KG	8/02/91	4-Nitrophenol
AB-7-5'	91.07037	621647	< 330.	UG/KG	8/02/91	N-Nitrosodi-n-propylamine
AB-7-5'	91.07037	62759	< 330.	UG/KG	8/02/91	N-Nitrosodimethylamine
AB-7-5'	91.07037	86306	< 330.	UG/KG	8/02/91	N-Nitrosodiphenylamine
AB-7-5'	91.07037	87865	< 330.	UG/KG	8/02/91	Pentachlorophenol
AB-7-5'	91.07037	85018	< 330.	UG/KG	8/02/91	Phenanthrene
AB-7-5'	91.07037	108952	< 330.	UG/KG	8/02/91	Phenol
AB-7-5'	91.07037	129000	< 330.	UG/KG	8/02/91	Pyrene

AB-7-5'	91.07037	120821	< 330.	UG/KG	/91	1,2,4-Trichlorobenzene
AB-7-5'	91.07037	95954	< 330.	UG/KG	/91	2,4,5-Trichlorophenol
AB-7-5'	91.07037	88062	< 330.	UG/KG	8/02/91	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.07037

none

Customer Sample Duplicate Results for Sample # 91.07037

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.07037

none

REPORT R: 11153

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.07038

Date Collected: 7/16/91 Date Received: 7/23/91 Date Extracted: 7/25/91 Date Analyzed: 7/25/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-7-20'	91.07038	83329	< 330.		UG/KG	8/02/91		Acenaphthene
AB-7-20'	91.07038	208968	< 330.		UG/KG	8/02/91		Acenaphthylene
AB-7-20'	91.07038	62533	< 330.		UG/KG	8/02/91		Aniline
AB-7-20'	91.07038	120127	< 330.		UG/KG	8/02/91		Anthracene
AB-7-20'	91.07038	103333	< 330.		UG/KG	8/02/91		Azobenzene
AB-7-20'	91.07038	92875	< 330.		UG/KG	8/02/91		m-Benzidine
AB-7-20'	91.07038	56553	< 330.		UG/KG	8/02/91		Benzo[a]anthracene
AB-7-20'	91.07038	50328	< 330.		UG/KG	8/02/91		Benzo[a]pyrene
AB-7-20'	91.07038	205992	< 330.		UG/KG	8/02/91		Benzo[b]fluoranthene
AB-7-20'	91.07038	191242	< 330.		UG/KG	8/02/91		Benzo[g,h,i]perylene
AB-7-20'	91.07038	207089	< 330.		UG/KG	8/02/91		Benzo[k]fluoranthene
AB-7-20'	91.07038	65850	< 330.		UG/KG	8/02/91		Benzoic acid
AB-7-20'	91.07038	100516	< 330.		UG/KG	8/02/91		Benzyl alcohol
AB-7-20'	91.07038	111911	< 330.		UG/KG	8/02/91		Bis(2-chloroethoxy)methane
AB-7-20'	91.07038	111444	< 330.		UG/KG	8/02/91		Bis(2-chloroethyl)ether
AB-7-20'	91.07038	108601	< 330.		UG/KG	8/02/91		Bis(2-chloroisopropyl)ether
AB-7-20'	91.07038	117817	< 330.		UG/KG	8/02/91		Bis(2-ethylhexyl)phthalate
AB-7-20'	91.07038	101553	< 330.		UG/KG	8/02/91		4-Bromophenylphenyl ether
AB-7-20'	91.07038	85687	< 330.		UG/KG	8/02/91		Butylbenzyl phthalate
AB-7-20'	91.07038	59507	< 330.		UG/KG	8/02/91		4-Chloro-3-methylphenol
AB-7-20'	91.07038	106478	< 330.		UG/KG	8/02/91		4-Chloroaniline

AB-7-20'	1.07038	91587	< 330.	UG/KG	/91	2-Chloronaphthalene
AB-7-20'	1.07038	95578	< 330.	UG/KG	/91	o-Chlorophenol
AB-7-20'	91.07038	7005723	< 330.	UG/KG	8/02/91	4-Chlorophenylphenyl ether
AB-7-20'	91.07038	218019	< 330.	UG/KG	8/02/91	Chrysene
AB-7-20'	91.07038	84742	< 330.	UG/KG	8/02/91	Di-n-butyl phthalate
AB-7-20'	91.07038	117840	< 330.	UG/KG	8/02/91	Di-n-octyl phthalate
AB-7-20'	91.07038	53703	< 330.	UG/KG	8/02/91	Dibenzo[a,h]anthracene
AB-7-20'	91.07038	132649	< 330.	UG/KG	8/02/91	Dibenzofuran
AB-7-20'	91.07038	95501	< 330.	UG/KG	8/02/91	o-Dichlorobenzene (1,2)
AB-7-20'	91.07038	541731	< 330.	UG/KG	8/02/91	m-Dichlorobenzene (1,3)
AB-7-20'	91.07038	106467	< 330.	UG/KG	8/02/91	p-Dichlorobenzene (1,4)
AB-7-20'	91.07038	91941	< 330.	UG/KG	8/02/91	3,3'-Dichlorobenzidine
AB-7-20'	91.07038	120832	< 330.	UG/KG	8/02/91	2,4-Dichlorophenol
AB-7-20'	91.07038	84662	< 330.	UG/KG	8/02/91	Diethyl phthalate
AB-7-20'	91.07038	131113	< 330.	UG/KG	8/02/91	Dimethyl phthalate
AB-7-20'	91.07038	105679	< 330.	UG/KG	8/02/91	2,4-Dimethylphenol
AB-7-20'	91.07038	51285	< 330.	UG/KG	8/02/91	2,4-Dinitrophenol
AB-7-20'	91.07038	121142	< 330.	UG/KG	8/02/91	2,4-Dinitrotoluene
AB-7-20'	91.07038	606202	< 330.	UG/KG	8/02/91	2,6-Dinitrotoluene
AB-7-20'	91.07038	206440	< 330.	UG/KG	8/02/91	Fluoranthene
AB-7-20'	91.07038	86737	< 330.	UG/KG	8/02/91	Fluorene
AB-7-20'	91.07038	118741	< 330.	UG/KG	8/02/91	Hexachlorobenzene
AB-7-20'	91.07038	87683	< 330.	UG/KG	8/02/91	Hexachlorobutadiene
AB-7-20'	91.07038	77474	< 330.	UG/KG	8/02/91	Hexachlorocyclopentadiene
AB-7-20'	91.07038	67721	< 330.	UG/KG	8/02/91	Hexachloroethane
AB-7-20'	91.07038	193395	< 330.	UG/KG	8/02/91	Indeno[1,2,3-cd]pyrene
AB-7-20'	91.07038	78591	< 330.	UG/KG	8/02/91	Isophorone
AB-7-20'	91.07038	534521	< 330.	UG/KG	8/02/91	2-Methyl-4,6-dinitrophenol
AB-7-20'	91.07038	91576	< 330.	UG/KG	8/02/91	2-Methylnaphthalene
AB-7-20'	91.07038	95487	< 330.	UG/KG	8/02/91	2-Methylphenol
AB-7-20'	91.07038	106445	< 330.	UG/KG	8/02/91	4-Methylphenol
AB-7-20'	91.07038	91203	< 330.	UG/KG	8/02/91	Naphthalene
AB-7-20'	91.07038	88744	< 330.	UG/KG	8/02/91	2-Nitroaniline
AB-7-20'	91.07038	99092	< 330.	UG/KG	8/02/91	3-Nitroaniline
AB-7-20'	91.07038	100016	< 330.	UG/KG	8/02/91	4-Nitroaniline
AB-7-20'	91.07038	98953	< 330.	UG/KG	8/02/91	Nitrobenzene
AB-7-20'	91.07038	88755	< 330.	UG/KG	8/02/91	2-Nitrophenol
AB-7-20'	91.07038	100027	< 330.	UG/KG	8/02/91	4-Nitrophenol
AB-7-20'	91.07038	621647	< 330.	UG/KG	8/02/91	N-Nitrosodi-n-propylamine
AB-7-20'	91.07038	62759	< 330.	UG/KG	8/02/91	N-Nitrosodimethylamine
AB-7-20'	91.07038	86306	< 330.	UG/KG	8/02/91	N-Nitrosodiphenylamine
AB-7-20'	91.07038	87865	< 330.	UG/KG	8/02/91	Pentachlorophenol
AB-7-20'	91.07038	85018	< 330.	UG/KG	8/02/91	Phenanthrene
AB-7-20'	91.07038	108952	< 330.	UG/KG	8/02/91	Phenol
AB-7-20'	91.07038	129000	< 330.	UG/KG	8/02/91	Pyrene

AB-7-20	91.07038	120821	< 330.	UG/KG	/91	1,2,4-Trichlorobenzene
AB-7-20	91.07038	95954	< 330.	UG/KG	/91	2,4,5-Trichlorophenol
AB-7-20'	91.07038	88062	< 330.	UG/KG	8/02/91	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.07038

none

Customer Sample Duplicate Results for Sample # 91.07038

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.07038

none

REPORT [illegible]R: 11153

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

Customer Sample Results, Sample # 91.07039

Date Collected: 7/16/91 Date Received: 7/23/91 Date Extracted: 7/25/91 Date Analyzed: 7/25/91

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
AB-7-80'	91.07039	83329	< 330.		UG/KG	8/02/91		Acenaphthene
AB-7-80'	91.07039	208968	< 330.		UG/KG	8/02/91		Acenaphthylene
AB-7-80'	91.07039	62533	< 330.		UG/KG	8/02/91		Aniline
AB-7-80'	91.07039	120127	< 330.		UG/KG	8/02/91		Anthracene
AB-7-80'	91.07039	103333	< 330.		UG/KG	8/02/91		Azobenzene
AB-7-80'	91.07039	92875	< 330.		UG/KG	8/02/91		m-Benzidine
AB-7-80'	91.07039	56553	< 330.		UG/KG	8/02/91		Benzo[a]anthracene
AB-7-80'	91.07039	50328	< 330.		UG/KG	8/02/91		Benzo[a]pyrene
AB-7-80'	91.07039	205992	< 330.		UG/KG	8/02/91		Benzo[b]fluoranthene
AB-7-80'	91.07039	191242	< 330.		UG/KG	8/02/91		Benzo[g,h,i]perylene
AB-7-80'	91.07039	207089	< 330.		UG/KG	8/02/91		Benzo[k]fluoranthene
AB-7-80'	91.07039	65850	< 330.		UG/KG	8/02/91		Benzoic acid
AB-7-80'	91.07039	100516	< 330.		UG/KG	8/02/91		Benzyl alcohol
AB-7-80'	91.07039	111911	< 330.		UG/KG	8/02/91		Bis(2-chloroethoxy)methane
AB-7-80'	91.07039	111444	< 330.		UG/KG	8/02/91		Bis(2-chloroethyl)ether
AB-7-80'	91.07039	108601	< 330.		UG/KG	8/02/91		Bis(2-chloroisopropyl)ether
AB-7-80'	91.07039	117817	< 330.		UG/KG	8/02/91		Bis(2-ethylhexyl)phthalate
AB-7-80'	91.07039	101553	< 330.		UG/KG	8/02/91		4-Bromophenylphenyl ether
AB-7-80'	91.07039	85687	< 330.		UG/KG	8/02/91		Butylbenzyl phthalate
AB-7-80'	91.07039	59507	< 330.		UG/KG	8/02/91		4-Chloro-3-methylphenol
AB-7-80'	91.07039	106478	< 330.		UG/KG	8/02/91		4-Chloroaniline

AB-7-80'	91.07039	91587	< 330.	UG/KG	/91	2-Chloronaphthalene
AB-7-80'	91.07039	95578	< 330.	UG/KG	/2/91	o-Chlorophenol
AB-7-80'	91.07039	7005723	< 330.	UG/KG	8/02/91	4-Chlorophenylphenyl ether
AB-7-80'	91.07039	218019	< 330.	UG/KG	8/02/91	Chrysene
AB-7-80'	91.07039	84742	< 330.	UG/KG	8/02/91	Di-n-butyl phthalate
AB-7-80'	91.07039	117840	< 330.	UG/KG	8/02/91	Di-n-octyl phthalate
AB-7-80'	91.07039	53703	< 330.	UG/KG	8/02/91	Dibenzo[a,h]anthracene
AB-7-80'	91.07039	132649	< 330.	UG/KG	8/02/91	Dibenzofuran
AB-7-80'	91.07039	95501	< 330.	UG/KG	8/02/91	o-Dichlorobenzene (1,2)
AB-7-80'	91.07039	541731	< 330.	UG/KG	8/02/91	m-Dichlorobenzene (1,3)
AB-7-80'	91.07039	106467	< 330.	UG/KG	8/02/91	p-Dichlorobenzene (1,4)
AB-7-80'	91.07039	91941	< 330.	UG/KG	8/02/91	3,3'-Dichlorobenzidine
AB-7-80'	91.07039	120832	< 330.	UG/KG	8/02/91	2,4-Dichlorophenol
AB-7-80'	91.07039	84662	< 330.	UG/KG	8/02/91	Diethyl phthalate
AB-7-80'	91.07039	131113	< 330.	UG/KG	8/02/91	Dimethyl phthalate
AB-7-80'	91.07039	105679	< 330.	UG/KG	8/02/91	2,4-Dimethylphenol
AB-7-80'	91.07039	51285	< 330.	UG/KG	8/02/91	2,4-Dinitrophenol
AB-7-80'	91.07039	121142	< 330.	UG/KG	8/02/91	2,4-Dinitrotoluene
AB-7-80'	91.07039	606202	< 330.	UG/KG	8/02/91	2,6-Dinitrotoluene
AB-7-80'	91.07039	206440	< 330.	UG/KG	8/02/91	Fluoranthene
AB-7-80'	91.07039	86737	< 330.	UG/KG	8/02/91	Fluorene
AB-7-80'	91.07039	118741	< 330.	UG/KG	8/02/91	Hexachlorobenzene
AB-7-80'	91.07039	87683	< 330.	UG/KG	8/02/91	Hexachlorobutadiene
AB-7-80'	91.07039	77474	< 330.	UG/KG	8/02/91	Hexachlorocyclopentadiene
AB-7-80'	91.07039	67721	< 330.	UG/KG	8/02/91	Hexachloroethane
AB-7-80'	91.07039	193395	< 330.	UG/KG	8/02/91	Indeno[1,2,3-cd]pyrene
AB-7-80'	91.07039	78591	< 330.	UG/KG	8/02/91	Isophorone
AB-7-80'	91.07039	534521	< 330.	UG/KG	8/02/91	2-Methyl-4,6-dinitrophenol
AB-7-80'	91.07039	91576	< 330.	UG/KG	8/02/91	2-Methylnaphthalene
AB-7-80'	91.07039	95487	< 330.	UG/KG	8/02/91	2-Methylphenol
AB-7-80'	91.07039	106445	< 330.	UG/KG	8/02/91	4-Methylphenol
AB-7-80'	91.07039	91203	< 330.	UG/KG	8/02/91	Naphthalene
AB-7-80'	91.07039	88744	< 330.	UG/KG	8/02/91	2-Nitroaniline
AB-7-80'	91.07039	99092	< 330.	UG/KG	8/02/91	3-Nitroaniline
AB-7-80'	91.07039	100016	< 330.	UG/KG	8/02/91	4-Nitroaniline
AB-7-80'	91.07039	98953	< 330.	UG/KG	8/02/91	Nitrobenzene
AB-7-80'	91.07039	88755	< 330.	UG/KG	8/02/91	2-Nitrophenol
AB-7-80'	91.07039	100027	< 330.	UG/KG	8/02/91	4-Nitrophenol
AB-7-80'	91.07039	621647	< 330.	UG/KG	8/02/91	N-Nitrosodi-n-propylamine
AB-7-80'	91.07039	62759	< 330.	UG/KG	8/02/91	N-Nitrosodimethylamine
AB-7-80'	91.07039	86306	< 330.	UG/KG	8/02/91	N-Nitrosodiphenylamine
AB-7-80'	91.07039	87865	< 330.	UG/KG	8/02/91	Pentachlorophenol
AB-7-80'	91.07039	85018	< 330.	UG/KG	8/02/91	Phenanthrene
AB-7-80'	91.07039	108952	< 330.	UG/KG	8/02/91	Phenol
AB-7-80'	91.07039	129000	< 330.	UG/KG	8/02/91	Pyrene

AB-7-80	91.07039	120821	< 330.	UG/KG	2/91	1,2,4-Trichlorobenzene
AB-7-80	91.07039	95954	< 330.	UG/KG	/91	2,4,5-Trichlorophenol
AB-7-80'	91.07039	88062	< 330.	UG/KG	o/02/91	2,4,6-Trichlorophenol

Tentatively Identified Compounds in Customer Sample # 91.07039

none

Customer Sample Duplicate Results for Sample # 91.07039

none

Tentatively Identified Compounds in Customer Sample Duplicates for Sample # 91.07039

none

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********** HSE-9 QUALITY ASSURANCE REPORT **********

Prepared by: LAT on 2-Aug-1991

EPA SEMIVOLATILES

REQUEST NUMBER: 11777 MATRIX: SS ANALYST: Martin Koby PROGRAM CODE: WH54

OWNER: Alice Barr GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0820

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

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only Blind QC samples run with this batch.

____ No QC samples run with this sample batch.

____ No QC samples for this constituent and matrix type available within HSE-9

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

Blank Results

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUN
00.20227	91.07045	83329	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Acenaphthene
00.20227	91.07045	208968	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Acenaphthylene
00.20227	91.07045	62533	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Aniline
00.20227	91.07045	120127	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Anthracene
00.20227	91.07045	103333	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Azobenzene
00.20227	91.07045	92875	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	m-Benzidine
00.20227	91.07045	56553	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Benzo[a]anthracene
00.20227	91.07045	50328	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Benzo[a]pyrene
00.20227	91.07045	205992	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Benzo[b]fluoranthene
00.20227	91.07045	191242	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Benzo[g,h,i]perylene
00.20227	91.07045	207089	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Benzo[k]fluoranthene
00.20227	91.07045	65850	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Benzoic acid
00.20227	91.07045	100516	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Benzyl alcohol
00.20227	91.07045	111911	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Bis(2-chloroethoxy)methane
00.20227	91.07045	111444	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Bis(2-chloroethyl)ether
00.20227	91.07045	108601	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Bis(2-chloroisopropyl)ether
00.20227	91.07045	117817	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Bis(2-ethylhexyl)phthalate
00.20227	91.07045	101553	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	4-Bromophenylphenyl ether
00.20227	91.07045	85687	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Butylbenzyl phthalate
00.20227	91.07045	59507	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	4-Chloro-3-methylphenol
00.20227	91.07045	106478	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	4-Chloroaniline
00.20227	91.07045	91587	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	2-Chloronaphthalene
00.20227	91.07045	95578	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	o-Chlorophenol
00.20227	91.07045	7005723	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	4-Chlorophenylphenyl ether
00.20227	91.07045	218019	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Chrysene
00.20227	91.07045	84742	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Di-n-butyl phthalate
00.20227	91.07045	117840	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Di-n-octyl phthalate
00.20227	91.07045	53703	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Dibenzo[a,h]anthracene
00.20227	91.07045	132649	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	Dibenzofuran
00.20227	91.07045	95501	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
00.20227	91.07045	541731	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
00.20227	91.07045	106467	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
00.20227	91.07045	91941	< 330.		UG/KG	0.0		8/02/91	UNDER CONTROL	3,3'-Dichlorob tine

00.202	91.07045	120832	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2,4-Dichlo ol
00.20227	91.07045	84662	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Diethyl phthalate
00.20227	91.07045	131113	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Dimethyl phthalate
00.20227	91.07045	105679	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2,4-Dimethylphenol
00.20227	91.07045	51285	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2,4-Dinitrophenol
00.20227	91.07045	121142	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2,4-Dinitrotoluene
00.20227	91.07045	606202	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2,6-Dinitrotoluene
00.20227	91.07045	206440	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Fluoranthene
00.20227	91.07045	86737	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Fluorene
00.20227	91.07045	118741	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Hexachlorobenzene
00.20227	91.07045	87683	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Hexachlorobutadiene
00.20227	91.07045	77474	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Hexachlorocyclopentadiene
00.20227	91.07045	67721	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Hexachloroethane
00.20227	91.07045	193395	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Indeno[1,2,3-cd]pyrene
00.20227	91.07045	78591	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Isophorone
00.20227	91.07045	534521	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2-Methyl-4,6-dinitrophenol
00.20227	91.07045	91576	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2-Methylnaphthalene
00.20227	91.07045	95487	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2-Methylphenol
00.20227	91.07045	106445	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	4-Methylphenol
00.20227	91.07045	91203	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Naphthalene
00.20227	91.07045	88744	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2-Nitroaniline
00.20227	91.07045	99092	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	3-Nitroaniline
00.20227	91.07045	100016	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	4-Nitroaniline
00.20227	91.07045	98953	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Nitrobenzene
00.20227	91.07045	88755	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2-Nitrophenol
00.20227	91.07045	100027	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	4-Nitrophenol
00.20227	91.07045	621647	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	N-Nitrosodi-n-propylamine
00.20227	91.07045	62759	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	N-Nitrosodimethylamine
00.20227	91.07045	86306	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	N-Nitrosodiphenylamine
00.20227	91.07045	87865	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Pentachlorophenol
00.20227	91.07045	85018	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Phenanthrene
00.20227	91.07045	108952	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Phenol
00.20227	91.07045	129000	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	Pyrene
00.20227	91.07045	120821	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	1,2,4-Trichlorobenzene
00.20227	91.07045	95954	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2,4,5-Trichlorophenol
00.20227	91.07045	88062	< 330.	UG/KG	0.0	8/02/91	UNDER CONTROL	2,4,6-Trichlorophenol

Blank Spike Results

none

Blank Spike Duplicate Results

none

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

Blind QC Results, Sample # 91,06399

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
91.06399	83329	2.9	0.87	MG/KG	4.7	0.5	7/19/91	UNDER CONTROL	Acenaphthene
91.06399	208968	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Acenaphthylene
91.06399	62533	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Aniline
91.06399	120127	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Anthracene
91.06399	103333	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Azobenzene
91.06399	92875	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	m-Benzidine
91.06399	56553	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[a]anthracene
91.06399	50328	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[a]pyrene
91.06399	205992	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[b]fluoranthene
91.06399	191242	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[g,h,i]perylene
91.06399	207089	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzo[k]fluoranthene
91.06399	65850	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzoic acid
91.06399	100516	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Benzyl alcohol
91.06399	111911	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-chloroethoxy)methane
91.06399	111444	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-chloroethyl)ether
91.06399	108601	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-chloroisopropyl)ether
91.06399	117817	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Bis(2-ethylhexyl)phthalate
91.06399	101553	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Bromophenylphenyl ether
91.06399	85687	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Butylbenzyl phthalate
91.06399	59507	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Chloro-3-methylphenol
91.06399	106478	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Chloroaniline
91.06399	91587	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Chloronaphthalene
91.06399	95578	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	o-Chlorophenol
91.06399	7005723	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Chlorophenylphenyl ether
91.06399	218019	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Chrysene
91.06399	84742	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Di-n-butyl phthalate
91.06399	117840	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Di-n-octyl phthalate
91.06399	53703	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Dibenzo[a,h]anthracene
91.06399	132649	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Dibenzofuran
91.06399	95501	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	o-Dichlorobenzene (1,2)
91.06399	541731	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	m-Dichlorobenzene (1,3)
91.06399	106467	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	p-Dichlorobenzene (1,4)
91.06399	91941	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	3,3'-Dichlorobenzidine
91.06399	120832	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4-Dichlorophenol
91.06399	84662	3.1	0.93	MG/KG	4.5	0.4	7/19/91	UNDER CONTROL	Diethyl phthalate

91.06399	131113	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Dimethyl phthalate
91.06399	105679	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4-Dimethylphenol
91.06399	51285	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4-Dinitrophenol
91.06399	121142	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4-Dinitrotoluene
91.06399	606202	3.2	0.96	MG/KG	4.7	0.5	7/19/91	UNDER CONTROL	2,6-Dinitrotoluene
91.06399	206440	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Fluoranthene
91.06399	86737	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Fluorene
91.06399	118741	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Hexachlorobenzene
91.06399	87683	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Hexachlorobutadiene
91.06399	77474	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Hexachlorocyclopentadiene
91.06399	67721	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Hexachloroethane
91.06399	193395	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Indeno[1,2,3-cd]pyrene
91.06399	78591	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Isophorone
91.06399	534521	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Methyl-4,6-dinitrophenol
91.06399	91576	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Methylnaphthalene
91.06399	95487	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Methylphenol
91.06399	106445	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Methylphenol
91.06399	91203	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Naphthalene
91.06399	88744	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Nitroaniline
91.06399	99092	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	3-Nitroaniline
91.06399	100016	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Nitroaniline
91.06399	98953	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Nitrobenzene
91.06399	88755	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2-Nitrophenol
91.06399	100027	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	4-Nitrophenol
91.06399	621647	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	N-Nitrosodi-n-propylamine
91.06399	62759	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	N-Nitrosodimethylamine
91.06399	86306	3.4	1.02	MG/KG	4.4	0.4	7/19/91	UNDER CONTROL	N-Nitrosodiphenylamine
91.06399	87865	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Pentachlorophenol
91.06399	85018	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Phenanthrene
91.06399	108952	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Phenol
91.06399	129000	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	Pyrene
91.06399	120821	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	1,2,4-Trichlorobenzene
91.06399	95954	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4,5-Trichlorophenol
91.06399	88062	< 0.33		MG/KG	0.0		7/19/91	UNDER CONTROL	2,4,6-Trichlorophenol

SURROGATE RESULTS FOR EPA SEMIVOLATILES

Surrogate 1 = 2-Fluorophenol (CAS # = 367124)
Surrogate 2 = Phenol-d5 (CAS # = 4165622)
Surrogate 3 = Nitrobenzene-d5 (CAS # = 4165600)
Surrogate 4 = 2-Fluorobiphenyl (CAS # = 321608)
Surrogate 5 = 2,4,6-Tribromophenol (CAS # = 118796)
Surrogate 6 = p-Terphenyl-d14 (CAS # =)

SAMPLE

COMPLETION

NUMBER	S	Surrogate 1	Surrogate 2	Surrogate 3	Surrogate 4	Surro	Surrogate 6	DATE
91.06217	%	54.75	63.55	57.08	62.88	79.19	84.7	2-Aug-1991
91.06217	%	5.33	19.84	4.24	29.64	75.8	81.3	2-Aug-1991
91.06399	%	60.77	74.08	63.16	72.94	58.89	86.78	19-Jul-1991
91.07037	%	65.61	78.2	66.62	75.58	66.74	86.56	2-Aug-1991
91.07038	%	56.66	72.09	60.26	68.18	69.97	80.94	2-Aug-1991
91.07039	%	65.6	82.62	68.8	76.78	73.48	88.68	2-Aug-1991
91.07045	%	64.95	79.	67.06	77.22	73.9	84.44	2-Aug-1991

EPA Limits:

Water	%	21 - 100	10 - 94	35 - 114	43 - 116	10 - 123	33 - 141
Soil	%	25 - 121	24 - 113	23 - 120	30 - 115	19 - 122	18 - 137

REPORT NUMBER: 11153

Analyst	Reviewer	Section Leader	QA Officer
8/2/91	8/2/91	8/2/91	
Date	Date	Date	Date

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.

****

APPENDIX F

DRILLING LOGS/COMPLETION DIAGRAMS FOR BOREHOLES NEAR TA-53 SURFACE IMPOUNDMENTS

DRILLING LOG

BOREHOLE	: B-53	**ELEVATION**	: Not Surveyed
GEOLOGIST	: Stoker & Gallaher	**TOTAL DEPTH**	: 50 feet
DATE DRILLED	: June 20, 1991	**DIAMETER**	: 4.00 in Auger
LOCATION	: TA-53 Impoundments	**CASING MATERIAL**	: Aluminum

DEPTH	**DESCRIPTION** (all depths in feet below ground surface)
0- 1	Surface fill materials
1-50	Tuff; Tshirege Unit 2b; low moisture; not cored

NEUTRON ACCESS WELL COMPLETION SUMMARY

```
LOCKING STEEL CAP IN CEMENT->LBA|X|<-- 1 FT OF TOPSOIL COVER
0.5 FT BENTONITE PELLETS ---->SA| |<-- TSHIREGE 2B TUFF AT 1 FT
ANNULUS FILLED WITH SAND ---->SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA|X|<-- COMPLETION DEPTH AT 44.9 FT
                                |C|<-- TOTAL DEPTH AT 50 FT
```

COMPLETION DIAGRAM IS NOT TO SCALE

```
-----------------------------
STEEL LOCKING CAP............L
ALUMINUM CASING, 2 in ID....A
CEMENT GROUT SEAL............B
MEDIUM GRAIN SILICA SAND....S
END-CAP PLUG................X
HOLE CAVED IN...............C
-----------------------------
```

DRILLING LOG

BOREHOLE	: 1-53	**ELEVATION**	: Not Surveyed
GEOLOGIST	: Stoker & Gallaher	**TOTAL DEPTH**	: 50 feet
DATE DRILLED	: June 17, 1991	**DIAMETER**	: 4.00 in Auger
LOCATION	: TA-53 Impoundments	**CASING MATERIAL**	: Aluminum

DEPTH	**DESCRIPTION** (all depths in feet below ground surface)
0- 1	Surface fill materials
1-50	Tuff; Tshirege Unit 2b; low moisture; not cored

NEUTRON ACCESS WELL COMPLETION SUMMARY

```
LOCKING STEEL CAP IN CEMENT->LBA|X|<-- 1 FT OF TOPSOIL COVER
0.5 FT BENTONITE PELLETS ---->SA| |<-- TSHIREGE 2B TUFF AT 1 FT
ANNULUS FILLED WITH SAND ---->SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA|X|<-- COMPLETION DEPTH AT 45.8 FT
                                |C|<-- TOTAL DEPTH AT 50 FT
```

COMPLETION DIAGRAM IS NOT TO SCALE

```
-----------------------------
STEEL LOCKING CAP...........L
ALUMINUM CASING, 2 in ID....A
CEMENT GROUT SEAL...........B
MEDIUM GRAIN SILICA SAND....S
END-CAP PLUG................X
HOLE CAVED IN...............C
-----------------------------
```

DRILLING LOG

BOREHOLE	: 2-53	**ELEVATION**	: Not Surveyed
GEOLOGIST	: Stoker & Gallaher	**TOTAL DEPTH**	: 50 feet
DATE DRILLED	: June 17, 1991	**DIAMETER**	: 4.00 in Auger
LOCATION	: TA-53 Impoundments	**CASING MATERIAL**	: Aluminum

DEPTH	**DESCRIPTION** (all depths in feet below ground surface)
0- 1	Surface fill materials
1-50	Tuff; Tshirege Unit 2b; low moisture; not cored

NEUTRON ACCESS WELL COMPLETION SUMMARY

```
LOCKING STEEL CAP IN CEMENT->LBA|X|<-- 1 FT OF TOPSOIL COVER
0.5 FT BENTONITE PELLETS ---->SA| |<-- TSHIREGE 2B TUFF AT 1 FT
ANNULUS FILLED WITH SAND ---->SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA|X|<-- COMPLETION DEPTH AT 46.0 FT
                                 |C|<-- TOTAL DEPTH AT 50 FT
```

COMPLETION DIAGRAM IS NOT TO SCALE

```
-----------------------------
STEEL LOCKING CAP............L
ALUMINUM CASING, 2 in ID....A
CEMENT GROUT SEAL............B
MEDIUM GRAIN SILICA SAND....S
END-CAP PLUG................X
HOLE CAVED IN...............C
-----------------------------
```

DRILLING LOG

BOREHOLE	: 3-53	**ELEVATION**	: Not Surveyed
GEOLOGIST	: Stoker & Gallaher	**TOTAL DEPTH**	: 50 feet
DATE DRILLED	: June 18, 1991	**DIAMETER**	: 4.00 in Auger
LOCATION	: TA-53 Impoundments	**CASING MATERIAL**	: Aluminum

DEPTH	**DESCRIPTION** (all depths in feet below ground surface)
0- 1	Surface fill materials
1-50	Tuff; Tshirege Unit 2b; low moisture; not cored

NEUTRON ACCESS WELL COMPLETION SUMMARY

```
LOCKING STEEL CAP IN CEMENT->LBA|X|<-- 1 FT OF TOPSOIL COVER
0.5 FT BENTONITE PELLETS ---->SA| |<-- TSHIREGE 2B TUFF AT 1 FT
ANNULUS FILLED WITH SAND ---->SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA|X|<-- COMPLETION DEPTH AT 47.5 FT
                                |C|<-- TOTAL DEPTH AT 50 FT
```

COMPLETION DIAGRAM IS NOT TO SCALE

```
-----------------------------
STEEL LOCKING CAP............L
ALUMINUM CASING, 2 in ID....A
CEMENT GROUT SEAL...........B
MEDIUM GRAIN SILICA SAND....S
END-CAP PLUG................X
HOLE CAVED IN...............C
-----------------------------
```

DRILLING LOG

BOREHOLE	: 4-53	**ELEVATION**	: Not Surveyed
GEOLOGIST	: Stoker & Gallaher	**TOTAL DEPTH**	: 50 feet
DATE DRILLED	: June 18, 1991	**DIAMETER**	: 4.00 in Auger
LOCATION	: TA-53 Impoundments	**CASING MATERIAL**	: Aluminum

DEPTH	**DESCRIPTION** (all depths in feet below ground surface)
0- 1	Surface fill materials
1-50	Tuff; Tshirege Unit 2b; low moisture; not cored

NEUTRON ACCESS WELL COMPLETION SUMMARY

```
LOCKING STEEL CAP IN CEMENT->LBA|X|<-- 1 FT OF TOPSOIL COVER
0.5 FT BENTONITE PELLETS ---->SA| |<-- TSHIREGE 2B TUFF AT 1 FT
ANNULUS FILLED WITH SAND ---->SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA| |
                               SA|X|<-- COMPLETION DEPTH AT 47.3 FT
                                 |C|<-- TOTAL DEPTH AT 50 FT
```

COMPLETION DIAGRAM IS NOT TO SCALE

```
-----------------------------
STEEL LOCKING CAP............L
ALUMINUM CASING, 2 in ID....A
CEMENT GROUT SEAL...........B
MEDIUM GRAIN SILICA SAND....S
END-CAP PLUG................X
HOLE CAVED IN...............C
-----------------------------
```

DRILLING LOG

BOREHOLE	: 5-53	**ELEVATION**	: Not Surveyed
GEOLOGIST	: Stoker & Gallaher	**TOTAL DEPTH**	: 100 feet
DATE DRILLED	: June 18, 1991	**DIAMETER**	: 4.00 in Auger
LOCATION	: TA-53 Impoundments	**CASING MATERIAL**	: Pore Gas Well

DEPTH	**DESCRIPTION** (all depths in feet below ground surface)
0- 3	Surface fill materials
3- 68	Tuff; Tshirege Unit 2b; low moisture; not cored
68-100	Tuff; Tshirege Unit 2a; low moisture; not cored

PORE GAS MONITORING SYSTEM COMPLETION SUMMARY

```
LOCKING STEEL CAP/2 FT CEMENT>LB| |
4 FT ALUMINUM CASING TO 1 FT->AS| |<-- TSHIREGE 2B TUFF AT 3 FT
2 FT BENTONITE PELLETS -------->S| |
ANNULUS FILLED WITH SAND ----->S| |
                               S| |
                               S| |
PORE GAS SAMPLE PORT 20 FT -->GS| |
                               S| |
                               S| |
                               S| |
PORE GAS SAMPLE PORT 40 FT -->GS| |
                               S| |
                               S| |
                               S| |
PORE GAS SAMPLE PORT 60 FT -->GS| |
                               S| |
                               S| |<-- TSHIREGE 2A CONTACT AT 68 FT
                               S| |
                               S| |
PORE GAS SAMPLE PORT 80 FT -->GS| |
                               S| |
                               S| |
                               S| |
PORE GAS SAMPLE PORT 93.5 FT->GS| |
                               S| |<-- COMPLETION DEPTH AT 94 FT
                                |C|<-- TOTAL DEPTH AT 100 FT
```

COMPLETION DIAGRAM IS NOT TO SCALE

```
-----------------------------
STEEL LOCKING CAP............L
CEMENT GROUT SEAL............B
ALUMINUM SURFACE CASING.....A
MEDIUM GRAIN SILICA SAND....S
PORE GAS SAMPLE PORT........G
HOLE CAVED IN...............C
-----------------------------
```

DRILLING LOG

BOREHOLE	: 6-53	**ELEVATION**	: Not Surveyed
GEOLOGIST	: Stoker & Gallaher	**TOTAL DEPTH**	: 150 feet
DATE DRILLED	: July 10, 1991	**DIAMETER**	: 6.875 in Core
LOCATION	: TA-53 Impoundments	**CASING MATERIAL**	: Open Hole

DEPTH **DESCRIPTION** (all depths in feet below ground surface)

0- 3 Surface fill materials

3- 68 Tuff; Tshirege Unit 2b; low moisture; cored

68-113 Tuff; Tshirege Unit 2a; low moisture; cored

113-133 Tuff; Tshirege Unit 1b; low moisture; cored

133-150 Tuff; Tshirege Unit 1a; low moisture; cored

SUBSURFACE SUMMARY

```
NO WELL COMPLETION TO DATE ---->|X|<-- 3 FT OF FILL COVER
(OPEN HOLE WITH TOP COVER)      | |<-- TSHIREGE 2B TUFF AT 3 FT
                                | |
                                | |
                                | |
                                | |
                                | |
                                | |<-- TSHIREGE 2A TUFF AT 68 FT
                                | |
                                | |
                                | |
                                | |
                                | |
                                | |
                                | |<-- TSHIREGE 1B TUFF AT 113 FT
                                | |
                                | |
                                | |<-- TSHIREGE 1A TUFF AT 133 FT
                                | |
                                | |
                                |C|<-- TOTAL DEPTH AT 150 FT
```

COMPLETION DIAGRAM IS NOT TO SCALE

```
-----------------------------
STEEL LOCKING CAP............L
ALUMINUM CASING, 2 in ID....A
CEMENT GROUT SEAL............B
MEDIUM GRAIN SILICA SAND....S
END-CAP PLUG................X
HOLE CAVED IN...............C
-----------------------------
```

DRILLING LOG

BOREHOLE	: 7-53	**ELEVATION**	: Not Surveyed
GEOLOGIST	: Stoker & McLin	**TOTAL DEPTH**	: 80 feet
DATE DRILLED	: July 17, 1991	**DIAMETER**	: 6.875 in Core
LOCATION	: TA-53 Impoundments	**CASING MATERIAL**	: Al+Lysimeter

DEPTH	**DESCRIPTION** (all depths in feet below ground surface)
0- 1	Light brown sandy soil cover
1-24	Tuff; Tshirege Unit 1a; low moisture; cored
24-43	Tuff; Tsankawi; low moisture; cored
43-80	Tuff; Otowi; low moisture; cored

NEUTRON ACCESS WELL & LYSIMETER COMPLETION SUMMARY

```
LOCKING STEEL CAP IN CEMENT->LBA|X|<-- 1 FT OF TOPSOIL COVER
0.5 FT BENTONITE PELLETS ---->SA| |<-- TSHIREGE 1A TUFF AT 1 FT
ANNULUS FILLED WITH SAND ---->SA| |
                              SA| |
                              SA| |<-- TSANKAWI TUFF AT 24 FT
                              SA| |
BENTONITE SEAL 35-37 FT ----->BA| |
                              FA| |
LYSIMETER PORT AT 38 FT ---->FVA| |
 (Lysimeter in Annulus)       FA| |
BENTONITE SEAL 39-40 FT ----->BA| |
                              SA| |<-- OTOWI TUFF AT 43 FT
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA| |
                              SA|X|<-- COMPLETION DEPTH AT 77 FT
                                |C|<-- TOTAL DEPTH AT 80 FT
```

COMPLETION DIAGRAM IS NOT TO SCALE

```
-----------------------------
STEEL LOCKING CAP............L
ALUMINUM CASING, 2 in ID....A
CEMENT GROUT SEAL............B
MEDIUM GRAIN SILICA SAND....S
PRESSURE-VACUUM LYSIMETER...V
FINE SILICA FLOUR............F
END-CAP PLUG................X
HOLE CAVED IN...............C
-----------------------------
```

APPENDIX G

LABORATORY ANALYSIS OF SOIL HYDRAULIC PROPERTIES FROM TA-53 IMPOUNDMENTS COREHOLE #6 AND COREHOLE #7

DANIEL B. STEPHENS & ASSOCIATES, INC.
ENVIRONMENTAL SCIENTISTS AND ENGINEERS

LABORATORY ANALYSIS OF SOIL HYDRAULIC PROPERTIES FROM TA-53 IMPOUNDMENTS COREHOLE #6, COREHOLE #7 AND COREHOLE SIMO-1

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

NOVEMBER 1991

6020 ACADEMY NE • SUITE 100 • ALBUQUERQUE, NM 87109 • (505) 822-9400

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INTRODUCTION

Daniel B. Stephens & Associates, Inc. (DBS&A) was requested by Dr. Alan Stoker of Los Alamos National Laboratory (LANL) to perform laboratory analysis for properties of corehole samples from TA-53 impoundments, as outlined in Subcontract No. 9-XT1-027EE-1. The scope of work included conducting the following tasks:

1. Initial moisture content, dry bulk density, and calculated porosity;
2. Saturated hydraulic conductivity;
3. Moisture characteristics; and
4. Unsaturated hydraulic conductivity (calculated).

SUMMARY

DBS&A has completed laboratory tests on corehole samples from TA-53 impoundments as specified by Dr. Alan Stoker of LANL and summarized in Table 1. Tables 2 through 5 give the results of the specified analyses. Raw laboratory data and graphical plots of data (where appropriate) are contained in Appendices A through D. Appendix E lists the methods used in these analyses. A detailed description of each method is available upon request.

Comparison of the desorption data from the SIMO-1 85.0-86.0 sample to data from SIMO-1 32.5-33.0 shows essentially the same curve except for a 17% discrepancy in porosity. Given that measured and calculated porosities were similar, we suspect a void may have been present in this sample. A void large enough to account for such a large difference would also drain in the potential range where the difference between the two samples was noted. Overall, however, the data appears internally consistent and reasonable.

Finally, DBS&A cannot guarantee that these results are fully representative of the undisturbed materials at the field scale, nor can we assume any responsibility for interpretations or analyses based on this data. We recommend that careful evaluation of these laboratory results should be made for your particular application.

TABLE 1. SUMMARY OF TESTS PERFORMED

LABORATORY SAMPLE NUMBER	SATURATED HYDRAULIC CONDUCTIVITY	MOISTURE CHARACTERISTICS		INITIAL MOISTURE CONTENT	DRY BULK DENSITY	CALCULATED POROSITY	UNSATURATED HYDRAULIC CONDUCTIVITY
		HANGING COLUMN	PRESSURE PLATE				
AB-6-40	X		X	X	X	X	X
AB-6-60	X		X	X	X	X	X
AB-6-100	X		X	X	X	X	X
AB-6-110	X		X	X	X	X	X
AB-6-150	X		X	X	X	X	X
AB-7-70	X		X	X	X	X	X
AB-7-80	X		X	X	X	X	X
SIMO-1 32.5-33.0	X		X	X	X	X	X
SIMO-1 85.0-86.0	X		X	X	X	X	X
SIMO-1 89.0-90.0	X		X	X	X	X	X
SIMO-1 21.8-22.3				X	X	X	
SIMO-1 40.5-41.0				X	X	X	
SIMO-1 50.0-51.0				X	X	X	
SIMO-1 53.0-54.0				X	X	X	
SIMO-1 59.0-64.0				X	X	X	
SIMO-1 70.0-71.0				X	X	X	

TABLE 2. SUMMARY OF INITIAL MOISTURE CONTENT, DRY BULK DENSITY, AND POROSITY

SAMPLE NUMBER	INITIAL MOISTURE CONTENT GRAVIMETRIC (%, g/g)	INITIAL MOISTURE CONTENT VOLUMETRIC (%, cm^3/cm^3)	DENSITY (g/cm^3)	CALCULATED POROSITY (%)
AB-6-40*	17.3	23.4	1.35	48.96
AB-6-60	32.1	44.0	1.37	48.25
AB-6-100	8.2	10.4	1.27	52.01
AB-6-110	14.8	21.7	1.47	44.70
AB-6-150	17.3	22.8	1.32	50.22
AB-7-70	14.1	17.5	1.24	53.04
AB-7-80	18.0	19.9	1.10	58.44
SIMO-1 32.5-33.0*	**	**	1.47	44.67
SIMO-1 85.0-86.0*	13.5	13.3	0.98	62.88
SIMO-1 89.0-90.0*	18.7	24.4	1.30	50.86
SIMO-1 21.8-22.3	8.2	9.8	1.19	55.14
SIMO-1 40.5-41.0	10.9	12.7	1.17	56.04
SIMO-1 50.0-51.0	3.3	5.1	1.55	41.3
SIMO-1 53.0-54.0	9.4	9.5	1.01	61.86
SIMO-1 59.0-64.0	3.6	4.8	1.33	49.87
SIMO-1 70.0-71.0	2.1	3.1	1.49	43.60

* Moisture content may be low due to air drying while sample was epoxied into sieve.

** Values not determined, laboratory omission.

TABLE 3. SUMMARY OF SATURATED HYDRAULIC CONDUCTIVITY TESTS

SAMPLE NUMBER	K_{sat} (cm/sec)	METHOD OF ANALYSIS	
		CONSTANT HEAD	FALLING HEAD
AB-6-40	3.7×10^{-4}	X	
AB-6-60	3.5×10^{-3}	X	
AB-6-100	8.8×10^{-4}	X	
AB-6-110	7.4×10^{-5}	X	
AB-6-150	6.1×10^{-5}	X	
AB-7-70	1.7×10^{-4}	X	
AB-7-80	2.2×10^{-4}	X	
SIMO-1 32.5-33.0	2.7×10^{-4}	X	
SIMO-1 85.0-86.0	2.0×10^{-4}	X	
SIMO-1 89.0-90.0	1.1×10^{-5}		X

TABLE 4. SUMMARY OF MOISTURE CHARACTERISTICS OF THE INITIAL DRAINAGE CURVE

SAMPLE NUMBER	PRESSURE HEAD (-cm water)	MOISTURE CONTENT (%,cm^3/cm^3)
AB-6-40	0	45.5
	87	36.7
	153	27.7
	500	8.2
	1020	6.8
	5200	6.2
	15100	5.7
AB-6-60	0	48.1
	61	45.6
	153	35.7
	510	16.1
	1020	13.1
	5100	8.0
	15200	6.0
AB-6-100	0	48.5
	87	39.5
	153	36.3
	500	23.4
	1020	18.9
	5200	14.0
	15100	11.1
AB-6-110	0	42.7
	62	41.7
	153	38.1
	510	26.8
	1020	13.2
	5100	8.6
	15200	5.3
AB-6-150	0	46.7
	62	46.0
	153	44.0
	510	34.1
	1020	24.3
	5100	11.3
	15200	7.9

TABLE 4. SUMMARY OF MOISTURE CHARACTERISTICS OF THE INITIAL DRAINAGE CURVE (CONTINUED)

SAMPLE NUMBER	PRESSURE HEAD (-cm water)	MOISTURE CONTENT (%,cm^3/cm^3)
AB-7-70	0	46.0
	62	44.6
	153	40.2
	510	26.7
	1020	19.1
	5100	15.8
	15200	13.7
AB-7-80	0	46.2
	62	45.6
	153	41.2
	510	28.7
	1020	19.2
	5100	15.1
	15200	13.4
SIMO-1 32.5-33.0	0	46.0
	62	43.1
	153	35.1
	510	24.0
	1020	20.3
	5100	16.9
	15200	15.2
SIMO-1 85.0-86.0	0	59.0
	87	45.7
	153	34.9
	500	23.2
	1020	21.7
	5200	18.5
	15100	15.9
SIMO-1 89.0-90.0	0	50.1
	87	48.8
	153	46.9
	500	37.9
	1020	33.4
	5200	27.9
	15100	26.2

TABLE 5. SUMMARY OF UNSATURATED HYDRAULIC PROPERTIES (CALCULATED)

SAMPLE NUMBER	α (cm^{-1})	N (dimensionless)	θ_r (%, cm^3/cm^3)	θ_s (%, cm^3/cm^3)	K_{sat} (cm/sec)
AB-6-40	0.00817	2.67099	5.7	45.5	3.7×10^{-4}
AB-6-60	0.00656	2.04344	6.0	48.1	3.5×10^{-3}
AB-6-100	0.00988	1.67448	11.1	48.5	8.8×10^{-4}
AB-6-110	0.00258	2.68146	5.3	42.7	7.4×10^{-5}
AB-6-150	0.00213	2.01017	7.9	46.7	6.1×10^{-5}
AB-7-70	0.00447	2.05814	13.7	46.0	1.7×10^{-4}
AB-7-80	0.00369	2.13599	13.4	46.2	2.2×10^{-4}
SIMO-1 32.5-33.0	0.00814	1.85590	15.2	46.0	2.7×10^{-4}
SIMO-1 85.0-86.0	0.01398	1.85470	15.9	59.0	2.0×10^{-4}
SIMO-1 89.0-90.0	0.00381	1.89216	26.2	50.1	1.1×10^{-5}

APPENDIX A

INITIAL MOISTURE CONTENT, DRY BULK DENSITY, AND CALCULATED POROSITY

SUMMARY OF INITIAL MOISTURE CONTENT, DRY BULK DENSITY, AND POROSITY

SAMPLE NUMBER	INITIAL MOISTURE CONTENT GRAVIMETRIC (%, g/g)	INITIAL MOISTURE CONTENT VOLUMETRIC (%, cm^3/cm^3)	DENSITY (g/cm^3)	CALCULATED POROSITY (%)
AB-6-40*	17.3	23.4	1.35	48.96
AB-6-60	32.1	44.0	1.37	48.25
AB-6-100	8.2	10.4	1.27	52.01
AB-6-110	14.8	21.7	1.47	44.70
AB-6-150	17.3	22.8	1.32	50.22
AB-7-70	14.1	17.5	1.24	53.04
AB-7-80	18.0	19.9	1.10	58.44
SIMO-1 32.5-33.0*	**	**	1.47	44.67
SIMO-1 85.0-86.0*	13.5	13.3	0.98	62.88
SIMO-1 89.0-90.0*	18.7	24.4	1.30	50.86
SIMO-1 21.8-22.3	8.2	9.8	1.19	55.14
SIMO-1 40.5-41.0	10.9	12.7	1.17	56.04
SIMO-1 50.0-51.0	3.3	5.1	1.55	41.3
SIMO-1 53.0-54.0	9.4	9.5	1.01	61.86
SIMO-1 59.0-64.0	3.6	4.8	1.33	49.87
SIMO-1 70.0-71.0	2.1	3.1	1.49	43.60

* Moisture content may be low due to air drying while sample was epoxied into sieve.

** Values not determined, laboratory omission.

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB6-40
RING NUMBER: AB6-40
DEPTH: 40 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 532.15 (g)
TARE WEIGHT, RING: 236.37 (g)
TARE WEIGHT, CAP: 0.00 (g)
SAMPLE VOLUME: 191.00 (cc)
DATE AND TIME INTO OVEN: 11/04 @ 1100
DATE AND TIME OUT OF OVEN: 11/05 @ 1300

DRY WEIGHT OF SAMPLE: 252.19 (g)
DRY BULK DENSITY: 1.32 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 50.17 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 22.82 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 17.28 (%)

COMMENTS: SAMPLE WAS AIR DRIED, EPOXIED, AND CUT BEFORE FIELD WEIGHT WAS OBTAINED.

LABORATORY ANALYSIS PERFORMED BY: C.PIGMAN
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB6-60
RING NUMBER: AB6-60
DEPTH: 60 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 619.60 (g)
TARE WEIGHT, RING: 156.90 (g)
TARE WEIGHT, CAP: 8.57 (g)
SAMPLE VOLUME: 250.71 (cc)
DATE AND TIME INTO OVEN: 11/04 @ 1100
DATE AND TIME OUT OF OVEN: 11/05 @ 1300

DRY WEIGHT OF SAMPLE: 343.82 (g)
DRY BULK DENSITY: 1.37 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY = 2.65 g/cm)

CALCULATED POROSITY: 48.25 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 44.00 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 32.08 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB6-100
RING NUMBER: AB6-100
DEPTH: 100 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 476.30 (g)
TARE WEIGHT, RING: 144.90 (g)
TARE WEIGHT, CAP: 8.52 (g)
SAMPLE VOLUME: 234.78 (cc)
DATE AND TIME INTO OVEN: 11/04 @ 1100
DATE AND TIME OUT OF OVEN: 11/05 @ 1300

DRY WEIGHT OF SAMPLE: 298.55 (g)
DRY BULK DENSITY: 1.27 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 52.01 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 10.36 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 8.15 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB6-110
RING NUMBER: AB6-110
DEPTH: 110 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 529.91 (g)
TARE WEIGHT, RING: 139.33 (g)
TARE WEIGHT, CAP: 9.04 (g)
SAMPLE VOLUME: 226.78 (cc)
DATE AND TIME INTO OVEN: 11/04 @ 1100
DATE AND TIME OUT OF OVEN: 11/05 @ 1300

DRY WEIGHT OF SAMPLE: 332.31 (g)
DRY BULK DENSITY: 1.47 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 44.70 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 21.71 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 14.81 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB6-150
RING NUMBER: AB6-150
DEPTH: 150 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 526.00 (g)
TARE WEIGHT, RING: 147.00 (g)
TARE WEIGHT, CAP: 8.40 (g)
SAMPLE VOLUME: 239.53 (cc)
DATE AND TIME INTO OVEN: 11/04 @ 1100
DATE AND TIME OUT OF OVEN: 11/05 @ 1300

DRY WEIGHT OF SAMPLE: 316.01 (g)
DRY BULK DENSITY: 1.32 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 50.22 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 22.79 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 17.27 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB7-70
RING NUMBER: AB7-70
DEPTH: 70 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 462.64 (g)
TARE WEIGHT, RING: 137.33 (g)
TARE WEIGHT, CAP: 8.75 (g)
SAMPLE VOLUME: 222.98 (cc)
DATE AND TIME INTO OVEN: 11/04 @ 1100
DATE AND TIME OUT OF OVEN: 11/05 @ 1300

DRY WEIGHT OF SAMPLE: 277.51 (g)
DRY BULK DENSITY: 1.24 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 53.04 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 17.51 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 14.07 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB7-80
RING NUMBER: AB7-80
DEPTH: 80 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 454.83 (g)
TARE WEIGHT, RING: 142.87 (g)
TARE WEIGHT, CAP: 8.75 (g)
SAMPLE VOLUME: 233.27 (cc)
DATE AND TIME INTO OVEN: 11/04 @ 1100
DATE AND TIME OUT OF OVEN: 11/05 @ 1300

DRY WEIGHT OF SAMPLE: 256.88 (g)
DRY BULK DENSITY: 1.10 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY = 2.65 g/cm)

CALCULATED POROSITY: 58.44 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 19.86 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 18.04 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 85.0-86.0
RING NUMBER: SIMO 1 85.0-86.0
DEPTH: 85.0-86.9 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 431.16 (g)
TARE WEIGHT, RING: 241.30 (g)
TARE WEIGHT, CAP: 0.00 (g)
SAMPLE VOLUME: 170.00 (cc)
DATE AND TIME INTO OVEN: 11/04 @ 1100
DATE AND TIME OUT OF OVEN: 11/05 @ 1300

DRY WEIGHT OF SAMPLE: 167.22 (g)
DRY BULK DENSITY: 0.98 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 62.88 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 13.32 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 13.54 (%)

COMMENTS: SAMPLE WAS AIR DRIED, EPOXIED AND CUT BEFORE FIELD WEIGHT WAS OBTAINED.

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 89.0-90.0
RING NUMBER: SIMO 1 89.0-90.0
DEPTH: 89.0-90.0 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 347.63 (g)
TARE WEIGHT, RING: 148.16 (g)
TARE WEIGHT, CAP: 0.00 (g)
SAMPLE VOLUME: 129.00 (cc)
DATE AND TIME INTO OVEN: 11/04 @ 1100
DATE AND TIME OUT OF OVEN: 11/05 @ 1300

DRY WEIGHT OF SAMPLE: 167.99 (g)
DRY BULK DENSITY: 1.30 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 50.86 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 24.40 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 18.74 (%)

COMMENTS: SAMPLE WAS AIR DRIED, EPOXIED AND CUT BEFORE FIELD WEIGHT WAS OBTAINED.

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 21.8-22.3
RING NUMBER: SIMO 1 21.8-22.3
DEPTH: 21.8-22.3 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 797.16 (g)
TARE WEIGHT, RING: 214.37 (g)
TARE WEIGHT, CAP: 17.42 (g)
SAMPLE VOLUME: 439.59 (cc)
DATE AND TIME INTO OVEN: 10/01 @ 0900
DATE AND TIME OUT OF OVEN: 10/02 @ 0900

DRY WEIGHT OF SAMPLE: 522.53 (g)
DRY BULK DENSITY: 1.19 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 55.14 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 9.75 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 8.20 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 40.5-41.0
RING NUMBER: SIMO 1 40.5-41.0
DEPTH: 40.5-41.0 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 767.36 (g)
TARE WEIGHT, RING: 214.02 (g)
TARE WEIGHT, CAP: 17.75 (g)
SAMPLE VOLUME: 414.40 (cc)
DATE AND TIME INTO OVEN: 10/01 @ 0900
DATE AND TIME OUT OF OVEN: 10/02 @ 0900

DRY WEIGHT OF SAMPLE: 482.79 (g)
DRY BULK DENSITY: 1.17 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 56.04 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 12.74 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 10.94 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SINO 1 50.0-51.0
RING NUMBER: SINO 1 50.0-51.0
DEPTH: 50.0-51.0 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 897.00 (g)
TARE WEIGHT, RING: 214.29 (g)
TARE WEIGHT, CAP: 17.71 (g)
SAMPLE VOLUME: 414.10 (cc)
DATE AND TIME INTO OVEN: 10/01 @ 0900
DATE AND TIME OUT OF OVEN: 10/02 @ 0900

DRY WEIGHT OF SAMPLE: 643.77 (g)
DRY BULK DENSITY: 1.55 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 41.33 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 5.13 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 3.30 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 53.0-54.0
RING NUMBER: SIMO 1 53.0-54.0
DEPTH: 53.0-54.0 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 700.69 (g)
TARE WEIGHT, RING: 213.24 (g)
TARE WEIGHT, CAP: 17.57 (g)
SAMPLE VOLUME: 424.98 (cc)
DATE AND TIME INTO OVEN: 10/01 @ 0900
DATE AND TIME OUT OF OVEN: 10/02 @ 0900

DRY WEIGHT OF SAMPLE: 429.50 (g)
DRY BULK DENSITY: 1.01 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 61.86 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 9.50 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 9.40 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 59.0-64.0
RING NUMBER: SIMO 1 59.0-64.0
DEPTH: 59.0-64.0 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 794.11 (g)
TARE WEIGHT, RING: 214.17 (g)
TARE WEIGHT, CAP: 17.65 (g)
SAMPLE VOLUME: 408.59 (cc)
DATE AND TIME INTO OVEN: 10/01 @ 0900
DATE AND TIME OUT OF OVEN: 10/02 @ 0900

DRY WEIGHT OF SAMPLE: 542.83 (g)
DRY BULK DENSITY: 1.33 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 49.87 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 4.76 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 3.58 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

DATA FOR INITIAL MOISTURE CONTENT,
BULK DENSITY, AND POROSITY

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 70.0-71.0
RING NUMBER: SIMO 1 70.0-71.0
DEPTH: 70.0-71.0 FT.

FIELD WEIGHT OF SAMPLE (W/PAN AND RING): 799.54 (g)
TARE WEIGHT, RING: 209.12 (g)
TARE WEIGHT, CAP: 17.58 (g)
SAMPLE VOLUME: 375.51 (cc)
DATE AND TIME INTO OVEN: 10/01 @ 0900
DATE AND TIME OUT OF OVEN: 10/02 @ 0900

DRY WEIGHT OF SAMPLE: 561.20 (g)
DRY BULK DENSITY: 1.49 (g/cc)
PARTICLE DENSITY: 2.65 (g/cc)
(METHOD: ASSUME MEAN PARTICLE DENSITY
= 2.65 g/cm)

CALCULATED POROSITY: 43.60 (% vol)

INITIAL MOISTURE CONTENT (VOLUMETRIC): 3.10 (% vol)

INITIAL MOISTURE CONTENT (GRAVIMETRIC): 2.07 (%)

COMMENTS:

LABORATORY ANALYSIS PERFORMED BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

APPENDIX B

SATURATED HYDRAULIC CONDUCTIVITY

SUMMARY OF SATURATED HYDRAULIC CONDUCTIVITY TESTS

SAMPLE NUMBER	K_{sat} (cm/sec)	METHOD OF ANALYSIS	
		CONSTANT HEAD	FALLING HEAD
AB-6-40	3.7×10^{-4}	X	
AB-6-60	3.5×10^{-3}	X	
AB-6-100	8.8×10^{-4}	X	
AB-6-110	7.4×10^{-5}	X	
AB-6-150	6.1×10^{-5}	X	
AB-7-70	1.7×10^{-4}	X	
AB-7-80	2.2×10^{-4}	X	
SIMO-1 32.5-33.0	2.7×10^{-4}	X	
SIMO-1 85.0-86.0	2.0×10^{-4}	X	
SIMO-1 89.0-90.0	1.1×10^{-5}		X

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

CONSTANT HEAD PERMEAMETER DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB-6-40
RING NUMBER: AB-6-40ZB
DEPTH: 40 FT.
TYPE OF WATER USED: TAP
SAMPLE LENGTH: 7.7 (cm)
SAMPLE RADIUS: 2.8 (cm)
SAMPLE X-SECTIONAL AREA: 24.28 (sq. cm)

DATE (1991)	TIME (DAY)	TEMP (C)	CHANGE HEAD(CM)	FLOW VOL(CC)	ELAPSED TIME(SEC)	K SAT (CM/SEC)	K SAT @ 20 (CM/SEC)
10/01	8:29	21.5	3.6	26.0	5676	4.0E-04	3.9E-04
10/01	13:15	22.0	3.5	14.8	3422	3.9E-04	3.7E-04
10/02	7:43	21.5	3.6	20.2	5035	3.5E-04	3.4E-04

AVERAGE K SAT: 3.7E-04 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. Hill
CALCULATIONS MADE BY: R. Hill
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

CONSTANT HEAD PERMEAMETER DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB-6-60
RING NUMBER: AB-6-60
DEPTH: 60 FT.
TYPE OF WATER USED: TAP
SAMPLE LENGTH: 8.8 (cm)
SAMPLE RADIUS: 3.0 (cm)
SAMPLE X-SECTIONAL AREA: 28.65 (sq. cm)

DATE (1991)	TIME (DAY)	TEMP (C)	CHANGE HEAD(CM)	FLOW VOL(CC)	ELAPSED TIME(SEC)	K SAT (CM/SEC)	K SAT @ 20 (CM/SEC)
9/30	14:38	23.0	3.6	49.8	1187	3.6E-03	3.3E-03
10/01	8:25	21.5	3.6	10.5	242	3.7E-03	3.5E-03
10/01	13:13	22.0	3.7	6.9	155	3.7E-03	3.5E-03
10/02	7:41	21.5	3.7	6.2	143	3.6E-03	3.5E-03

AVERAGE K SAT: 3.5E-03 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. Hill
CALCULATIONS MADE BY: R. Hill
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

CONSTANT HEAD PERMEAMETER DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB-6-100
RING NUMBER: AB-6-100
DEPTH: 100 FT.
TYPE OF WATER USED: TAP
SAMPLE LENGTH: 8.1 (cm)
SAMPLE RADIUS: 3.0 (cm)
SAMPLE X-SECTIONAL AREA: 29.13 (sq. cm)

DATE (1991)	TIME (DAY)	TEMP (C)	CHANGE HEAD(CM)	FLOW VOL(CC)	ELAPSED TIME(SEC)	K SAT (CM/SEC)	K SAT @ 20 (CM/SEC)
9/30	14:38	23.0	4.3	17.1	1265	8.7E-04	8.1E-04
10/1	8:25	21.5	4.5	19.1	1300	9.0E-04	8.7E-04
10/1	13:13	22.0	4.5	3.2	211	9.4E-04	9.0E-04
10/2	7:41	21.5	4.5	10.1	630	9.8E-04	9.5E-04

AVERAGE K SAT: 8.8E-04 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. Hill
CALCULATIONS MADE BY: R. Hill
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

CONSTANT HEAD PERMEAMETER DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB-6-110
RING NUMBER: AB-6-110
DEPTH: 110 FT.
TYPE OF WATER USED: TAP
SAMPLE LENGTH: 7.8 (cm)
SAMPLE RADIUS: 3.1 (cm)
SAMPLE X-SECTIONAL AREA: 29.22 (sq. cm)

DATE (1991)	TIME (DAY)	TEMP (C)	CHANGE HEAD(CM)	FLOW VOL(CC)	ELAPSED TIME(SEC)	K SAT (CM/SEC)	K SAT @ 20 (CM/SEC)
9/30	14:39	23.0	4.7	5.5	4024	7.7E-05	7.2E-05
10/1	8:27	21.5	4.8	8.1	5930	7.6E-05	7.3E-05
10/1	13:14	22.0	4.8	5.0	3603	7.7E-05	7.4E-05
10/2	7:41	21.5	4.7	20.4	14448	8.0E-05	7.7E-05

AVERAGE K SAT: 7.4E-05 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. Hill
CALCULATIONS MADE BY: R. Hill
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

CONSTANT HEAD PERMEAMETER DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB-6-150
RING NUMBER: AB-6-150
DEPTH: 150 FT.
TYPE OF WATER USED: TAP
SAMPLE LENGTH: 8.3 (cm)
SAMPLE RADIUS: 3.0 (cm)
SAMPLE X-SECTIONAL AREA: 29.03 (sq. cm)

DATE (1991)	TIME (DAY)	TEMP (C)	CHANGE HEAD(CM)	FLOW VOL(CC)	ELAPSED TIME(SEC)	K SAT (CM/SEC)	K SAT @ 20 (CM/SEC)
9/30	10:22	24.0	4.2	4.0	4241	6.4E-05	5.9E-05
9/30	14:37	23.0	4.1	3.9	4155	6.5E-05	6.0E-05
10/1	8:25	21.5	4.2	5.8	6093	6.4E-05	6.2E-05
10/1	13:13	22.0	4.3	3.6	3710	6.4E-05	6.1E-05

AVERAGE K SAT: 6.1E-05 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. Hill
CALCULATIONS MADE BY: R. Hill
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

CONSTANT HEAD PERMEAMETER DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB-7-70
RING NUMBER: AB-7-70
DEPTH: 70 FT.
TYPE OF WATER USED: TAP
SAMPLE LENGTH: 7.6 (cm)
SAMPLE RADIUS: 3.1 (cm)
SAMPLE X-SECTIONAL AREA: 29.22 (sq. cm)

DATE (1991)	TIME (DAY)	TEMP (C)	CHANGE HEAD(CM)	FLOW VOL(CC)	ELAPSED TIME(SEC)	K SAT (CM/SEC)	K SAT @ 20 (CM/SEC)
9/30	10:21	24.0	5.0	13.7	3946	1.8E-04	1.7E-04
10/01	8:23	21.5	5.0	20.3	5909	1.8E-04	1.7E-04
10/01	13:12	22.0	5.0	12.4	3547	1.8E-04	1.7E-04
10/02	7:40	21.5	5.1	6.2	1754	1.8E-04	1.7E-04

AVERAGE K SAT: 1.7E-04 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. Hill
CALCULATIONS MADE BY: R. Hill
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

CONSTANT HEAD PERMEAMETER DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: A8-7-80
RING NUMBER: A8-7-80
DEPTH: 80 FT.
TYPE OF WATER USED: TAP
SAMPLE LENGTH: 7.9 (cm)
SAMPLE RADIUS: 3.1 (cm)
SAMPLE X-SECTIONAL AREA: 29.42 (sq. cm)

DATE (1991)	TIME (DAY)	TEMP (C)	CHANGE HEAD(CM)	FLOW VOL(CC)	ELAPSED TIME(SEC)	K SAT (CM/SEC)	K SAT @ 20 (CM/SEC)
9/27	7:37	21.5	4.4	9.4	2366	2.4E-04	2.4E-04
9/30	10:24	24.0	4.4	14.6	3856	2.3E-04	2.1E-04
9/30	14:39	23.0	4.4	4.8	1295	2.3E-04	2.1E-04
10/1	8:26	21.5	4.4	21.1	5805	2.2E-04	2.1E-04

AVERAGE K SAT: 2.2E-04 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. Hill
CALCULATIONS MADE BY: R. Hill
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

CONSTANT HEAD PERMEAMETER DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1
RING NUMBER: SIMO 1 32.5-33
DEPTH: 32.5-33 FT.
TYPE OF WATER USED: TAP
SAMPLE LENGTH: 7.6 (cm)
SAMPLE RADIUS: 3.1 (cm)
SAMPLE X-SECTIONAL AREA: 29.61 (sq. cm)

DATE (1991)	TIME (DAY)	TEMP (C)	CHANGE HEAD(CM)	FLOW VOL(CC)	ELAPSED TIME(SEC)	K SAT (CM/SEC)	K SAT @ 20 (CM/SEC)
9/30	14:40	23.0	4.6	6.8	1380	2.7E-04	2.6E-04
10/1	8:27	21.5	4.5	27.4	5606	2.8E-04	2.7E-04
10/1	13:14	22.0	4.5	16.6	3337	2.8E-04	2.7E-04
10/2	7:42	21.5	4.6	8.7	1680	2.9E-04	2.8E-04

AVERAGE K SAT: 2.7E-04 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. Hill
CALCULATIONS MADE BY: R. Hill
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

CONSTANT HEAD PERMEAMETER DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 85-86
RING NUMBER: SIMO 1 85-86
DEPTH: 85-86 FT.
TYPE OF WATER USED: TAP
SAMPLE LENGTH: 7.2 (cm)
SAMPLE RADIUS: 2.8 (cm)
SAMPLE X-SECTIONAL AREA: 25.25 (sq. cm)

DATE (1991)	TIME (DAY)	TEMP (C)	CHANGE HEAD(CM)	FLOW VOL(CC)	ELAPSED TIME(SEC)	K SAT (CM/SEC)	K SAT @ 20 (CM/SEC)
10/1	8:28	21.5	4.4	20.4	5788	2.3E-04	2.2E-04
10/1	13:15	22.0	4.5	10.9	3467	2.0E-04	1.9E-04
10/2	7:46	21.5	4.5	5.0	1526	2.1E-04	2.0E-04

AVERAGE K SAT: 2.0E-04 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. Hill
CALCULATIONS MADE BY: R. Hill
CHECKED BY: M. ANKENY

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

FALLING HEAD TEST DATA

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 89-90
RING NUMBER: SIMO 89-90
DEPTH: 89-90 FT.
TYPE OF WATER USED: TAP
SAMPLE X-SECTION AREA: 25.79 (sq. cm)
STANDPIPE X-SECTION AREA: 0.636 (sq. cm)
SAMPLE LENGTH: 5.2 (cm)

DATE (1991)	TIME	DEL T (SEC)	TEMP (C)	RESERVOIR HEAD(CM)	SAMPLE HEAD(CM)	K SAT (CM/SEC)	K SAT @ 20 C (CM/SEC)
TEST # 1:							
10/7	7:28		21.0	80.2	0.0		
10/7	8:29	3681	22.0	57.1	0.0	1.2E-05	1.1E-05
TEST # 2:							
10/9	6:28		20.0	78.0	0.0		
10/9	7:15	2815	20.0	61.5	0.0	1.1E-05	1.1E-05

AVERAGE K SAT: 1.1E-05 (CM/SEC)

COMMENTS:

LABORATORY ANALYSIS BY: R. HILL
CALCULATIONS MADE BY: R. HILL
CHECKED BY: M. ANKENY

APPENDIX C

MOISTURE CHARACTERISTICS

SUMMARY OF MOISTURE CHARACTERISTICS OF THE INITIAL DRAINAGE CURVE

SAMPLE NUMBER	PRESSURE HEAD (-cm water)	MOISTURE CONTENT (%,cm^3/cm^3)
AB-6-40	0	45.5
	87	36.7
	153	27.7
	500	8.2
	1020	6.8
	5200	6.2
	15100	5.7
AB-6-60	0	48.1
	61	45.6
	153	35.7
	510	16.1
	1020	13.1
	5100	8.0
	15200	6.0
AB-6-100	0	48.5
	87	39.5
	153	36.3
	500	23.4
	1020	18.9
	5200	14.0
	15100	11.1
AB-6-110	0	42.7
	62	41.7
	153	38.1
	510	26.8
	1020	13.2
	5100	8.6
	15200	5.3
AB-6-150	0	46.7
	62	46.0
	153	44.0
	510	34.1
	1020	24.3
	5100	11.3
	15200	7.9

SUMMARY OF MOISTURE CHARACTERISTICS OF THE INITIAL DRAINAGE CURVE (CONTINUED)

SAMPLE NUMBER	PRESSURE HEAD (-cm water)	MOISTURE CONTENT (%,cm^3/cm^3)
AB-7-70	0	46.0
	62	44.6
	153	40.2
	510	26.7
	1020	19.1
	5100	15.8
	15200	13.7
AB-7-80	0	46.2
	62	45.6
	153	41.2
	510	28.7
	1020	19.2
	5100	15.1
	15200	13.4
SIMO-1 32.5-33.0	0	46.0
	62	43.1
	153	35.1
	510	24.0
	1020	20.3
	5100	16.9
	15200	15.2
SIMO-1 85.0-86.0	0	59.0
	87	45.7
	153	34.9
	500	23.2
	1020	21.7
	5200	18.5
	15100	15.9
SIMO-1 89.0-90.0	0	50.1
	87	48.8
	153	46.9
	500	37.9
	1020	33.4
	5200	27.9
	15100	26.2

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

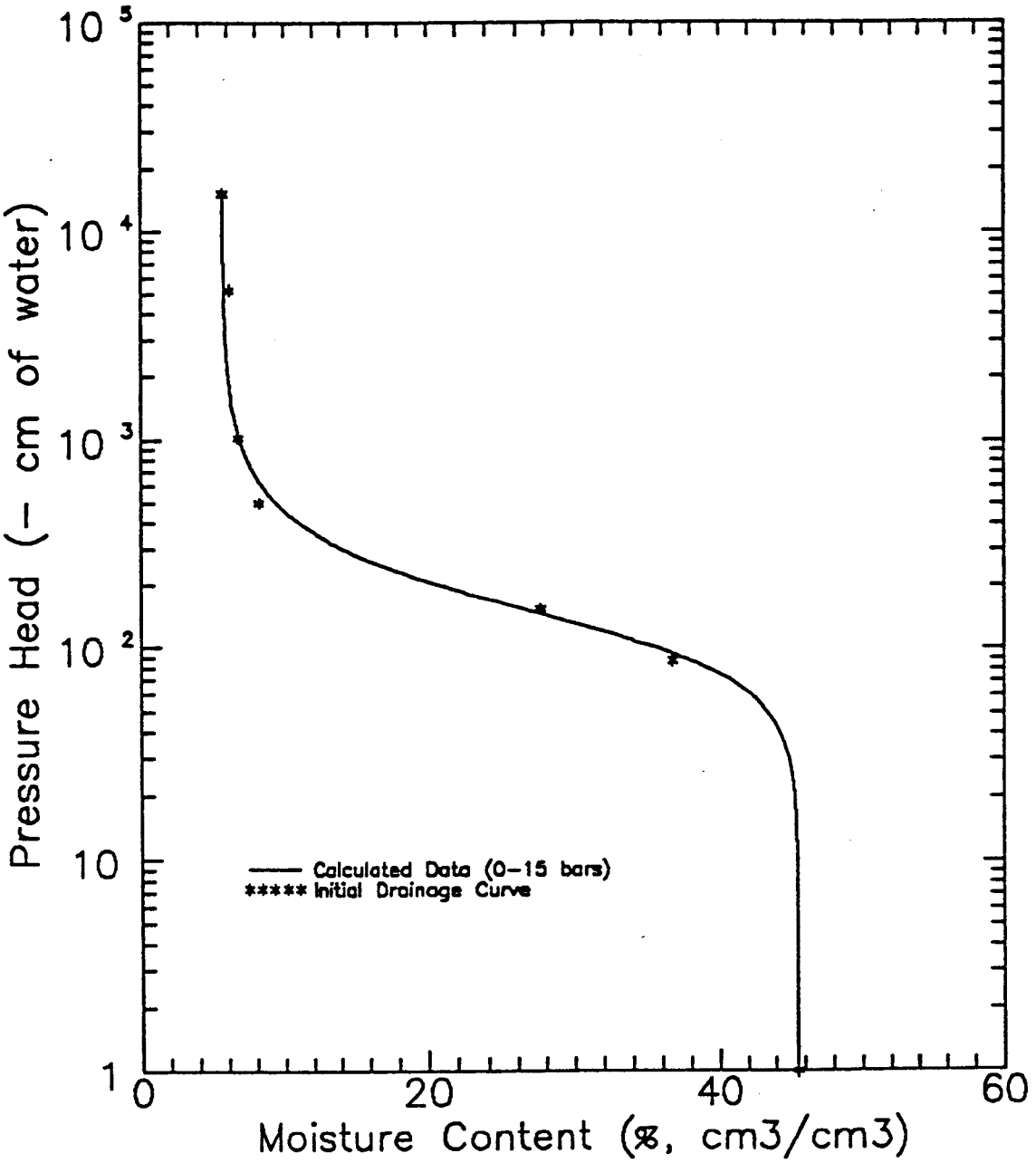
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB6-40
RING NUMBER: AB6-40
DEPTH: 40.0 FT.
SAMPLE VOLUME: 191.00 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 603.07 (g)
TARE RING: 236.37 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 27.59 (g)
DRY WEIGHT OF SAMPLE: 252.19 (g)
SATURATED MOISTURE CONTENT: 45.51 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 86.92 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES WT (g)	MOISTURE CONTENT (%, cm3/cm3)
10/09	0800	0.00	603.07	--	--	45.51
10/14	1045	0.09	586.27	16.80	16.80	36.71
10/17	1300	0.15	568.97	17.30	34.10	27.65
10/21	730	0.49	531.87	54.40	71.20	8.23
10/24	1430	1.0	529.05	2.82	74.02	6.75
10/28	1649	5.1	527.92	1.13	75.15	6.16
11/04	1335	14.8	527.04	0.88	76.03	5.70

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: K. Evans
CHECKED BY: M. Ankeny



Pressure Head vs. Moisture Content, Sample No. AB6-40

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

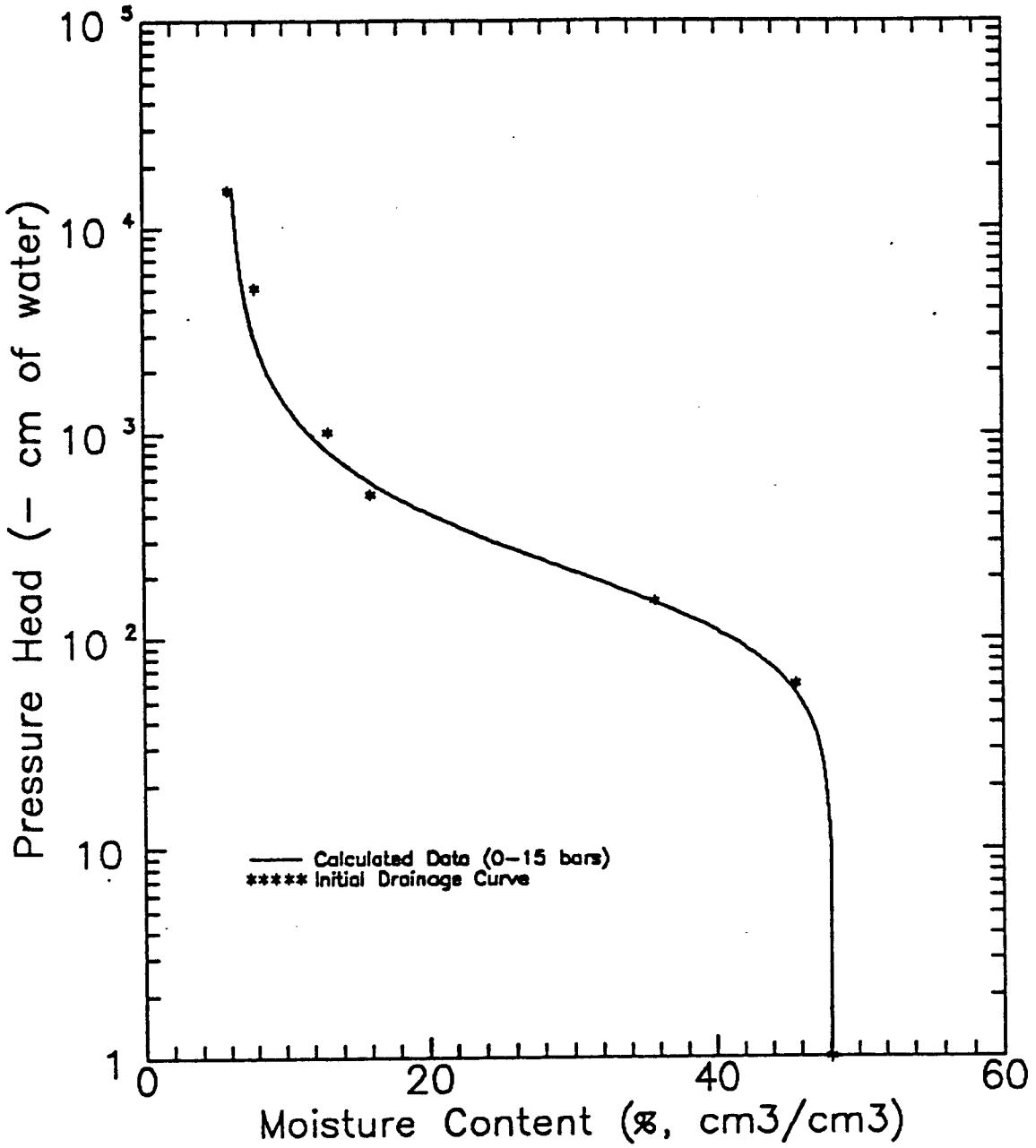
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB6-60
RING NUMBER: AB6-60
DEPTH: 60 FT.
SAMPLE VOLUME: 250.71 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 646.78 (g)
TARE RING: 156.90 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 25.56 (g)
DRY WEIGHT OF SAMPLE: 343.82 (g)
SATURATED MOISTURE CONTENT: 48.06 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 120.50 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES (g)	MOISTURE CONTENT (%, cm3/cm3)
10/04	0800	0.00	646.78	--	--	48.06
10/08	0830	0.06	640.70	6.08	6.08	45.64
10/14	1040	0.15	615.81	24.89	30.97	35.71
10/21	0715	0.50	566.57	49.24	80.21	16.07
10/24	1445	1.0	559.18	7.39	87.60	13.12
10/28	1620	5.0	546.24	12.94	100.54	7.96
11/04	1330	14.9	541.43	4.81	105.35	6.04

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: R. Hill
CHECKED BY: M. Ankeny



Pressure Head vs. Moisture Content, Sample No. AB6-60

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

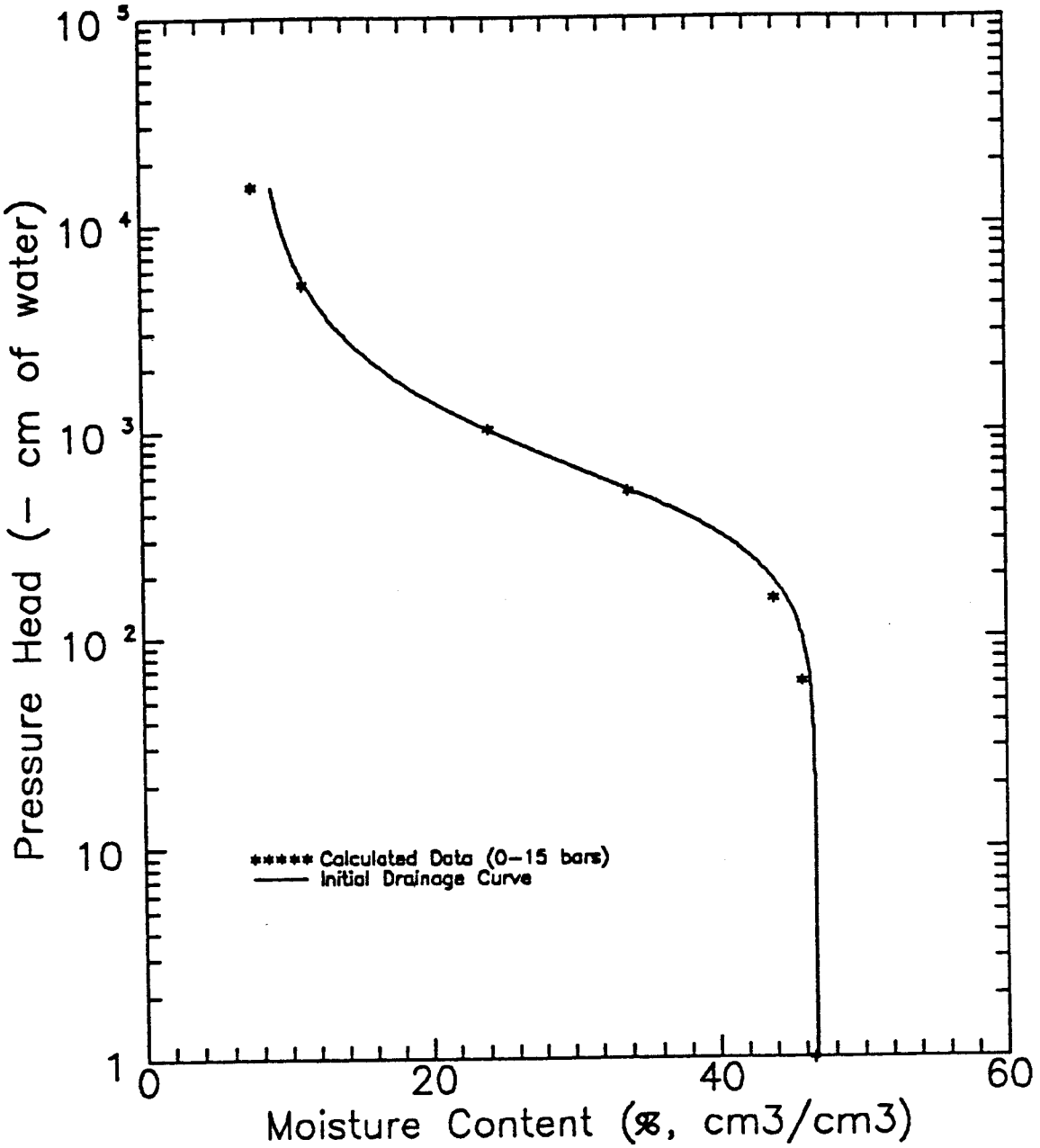
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB6-100
RING NUMBER: AB6-100
DEPTH: 100 FT.
SAMPLE VOLUME: 234.78 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 582.86 (g)
TARE RING: 144.90 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 25.47 (g)
DRY WEIGHT OF SAMPLE: 298.55 (g)
SATURATED MOISTURE CONTENT: 48.53 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 113.94 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES (g)	MOISTURE CONTENT (%, cm3/cm3)
10/10	0800	0.00	582.86	--	--	48.53
10/14	0830	0.09	561.68	21.18	21.18	39.51
10/17	1040	0.15	554.10	7.58	28.76	36.28
10/21	0715	0.49	523.87	30.23	58.99	23.40
10/24	1445	1.0	513.25	10.62	69.61	18.88
10/28	1620	5.1	501.87	11.38	80.99	14.03
11/04	1330	14.8	495.10	6.77	87.76	11.15

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: R. Hill
CHECKED BY: M. Ankeny



Pressure Head vs. Moisture Content, Sample No. AB6-100

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

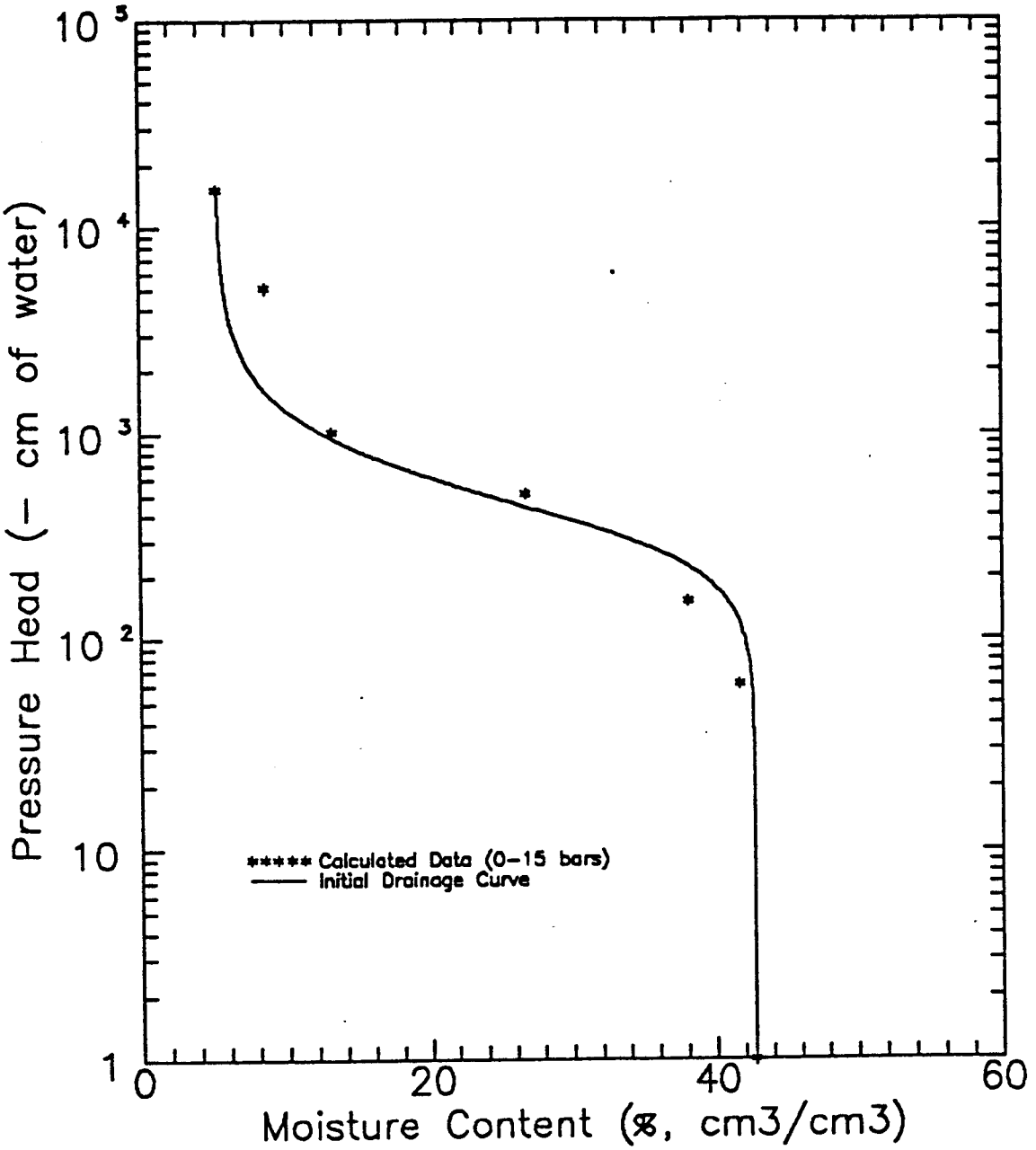
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: A86-110
RING NUMBER: A86-110
DEPTH: 110 FT.
SAMPLE VOLUME: 226.78 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 593.96 (g)
TARE RING: 139.33 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 25.50 (g)
DRY WEIGHT OF SAMPLE: 332.31 (g)
SATURATED MOISTURE CONTENT: 42.69 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 96.82 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES WT (g)	MOISTURE CONTENT (%, cm3/cm3)
10/04	0800	0.00	593.96	--	--	42.69
10/08	0830	0.06	591.62	2.34	2.34	41.66
10/14	1040	0.15	583.45	8.17	10.51	38.06
10/21	0715	0.50	557.98	25.47	35.98	26.83
10/24	1445	1.0	527.06	30.92	66.90	13.19
10/28	1620	5.0	516.71	10.35	77.25	8.63
11/04	1330	14.9	509.16	7.55	84.80	5.30

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: R. Hill
CHECKED BY: M. Ankeny



Pressure Head vs. Moisture Content, Sample No. AB6-110

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

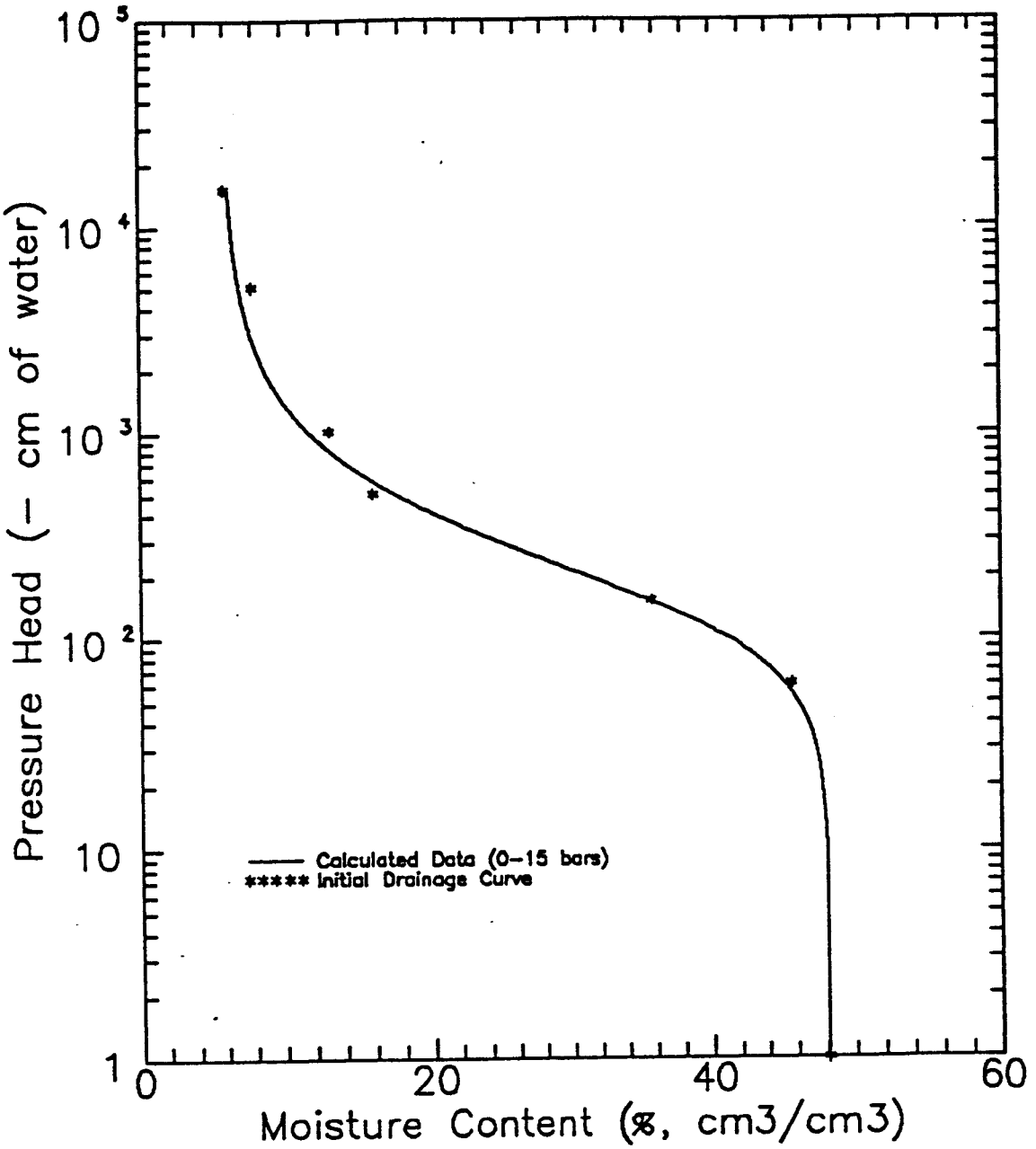
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB6-150
RING NUMBER: AB6-150
DEPTH: 150 FT.
SAMPLE VOLUME: 239.53 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 600.61 (g)
TARE RING: 147.37 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 25.78 (g)
DRY WEIGHT OF SAMPLE: 316.01 (g)
SATURATED MOISTURE CONTENT: 46.53 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 111.45 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES (g)	MOISTURE CONTENT (%, cm3/cm3)
10/04	0800	0.00	600.61	--	--	46.53
10/08	0830	0.06	598.90	1.71	1.71	45.81
10/14	1040	0.15	594.29	4.61	6.32	43.89
10/21	0715	0.50	570.35	23.94	30.26	33.90
10/24	1445	1.0	546.93	23.42	53.68	24.12
10/28	1620	5.0	515.89	31.04	84.72	11.16
11/04	1330	14.9	507.63	8.26	92.98	7.71

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: R. Hill
CHECKED BY: M. Ankeny



Pressure Head vs. Moisture Content, Sample No. AB6-150

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

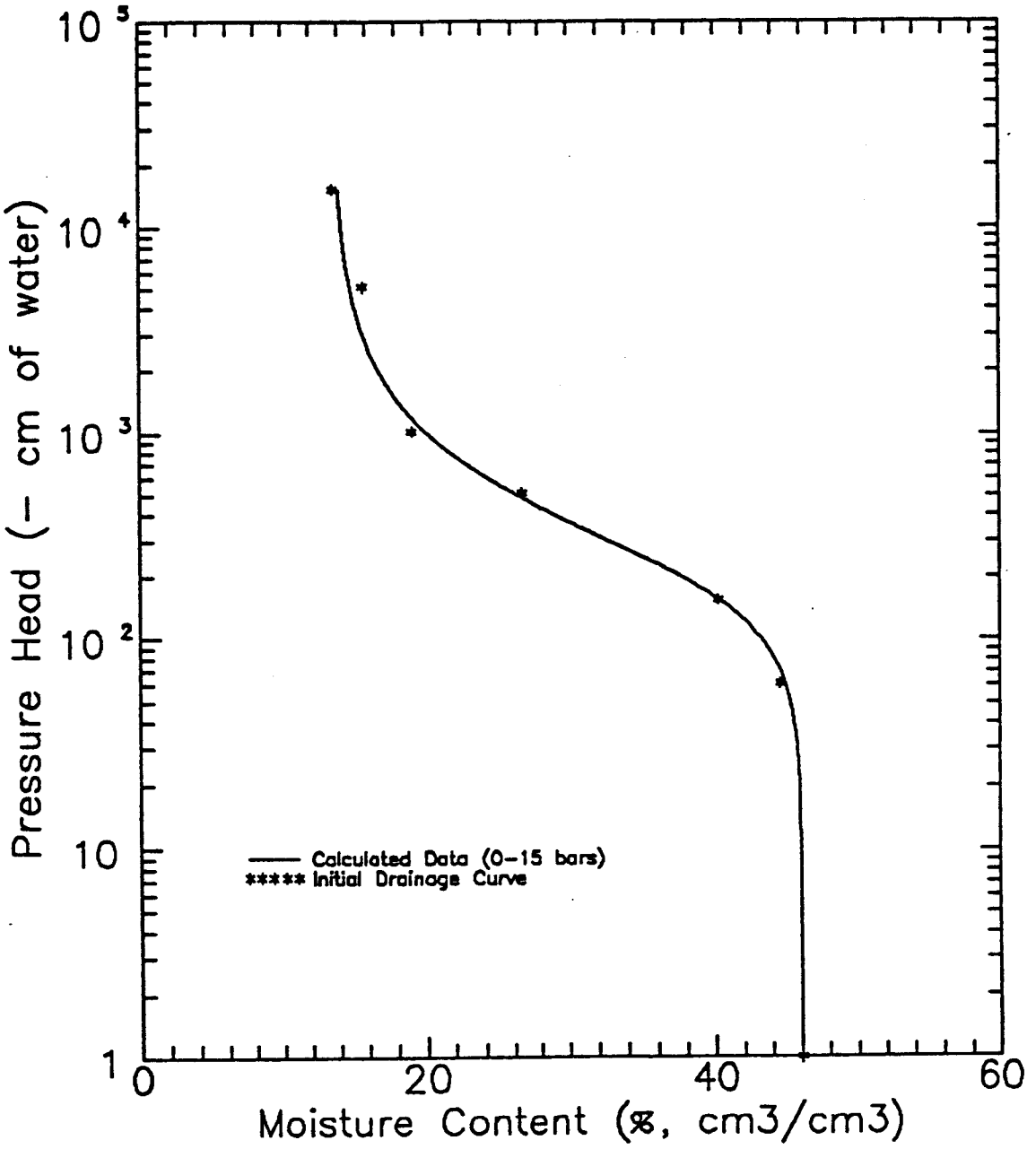
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: A87-70
RING NUMBER: A87-70
DEPTH: 70 FT.
SAMPLE VOLUME: 222.98 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 542.90 (g)
TARE RING: 137.33 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 25.53 (g)
DRY WEIGHT OF SAMPLE: 277.51 (g)
SATURATED MOISTURE CONTENT: 45.98 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 102.53 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES WT (g)	MOISTURE CONTENT (%, cm3/cm3)
10/04	0800	0.00	542.90	--	--	45.98
10/08	0830	0.06	539.72	3.18	3.18	44.56
10/14	1040	0.15	530.05	9.67	12.85	40.22
10/21	0715	0.50	499.93	30.12	42.97	26.71
10/24	1445	1.0	483.04	16.89	59.86	19.14
10/28	1620	5.0	475.55	7.49	67.35	15.78
11/04	1330	14.9	470.82	4.73	72.08	13.66

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: R. Hill
CHECKED BY: M. Ankeny



Pressure Head vs. Moisture Content, Sample No. AB7-70

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

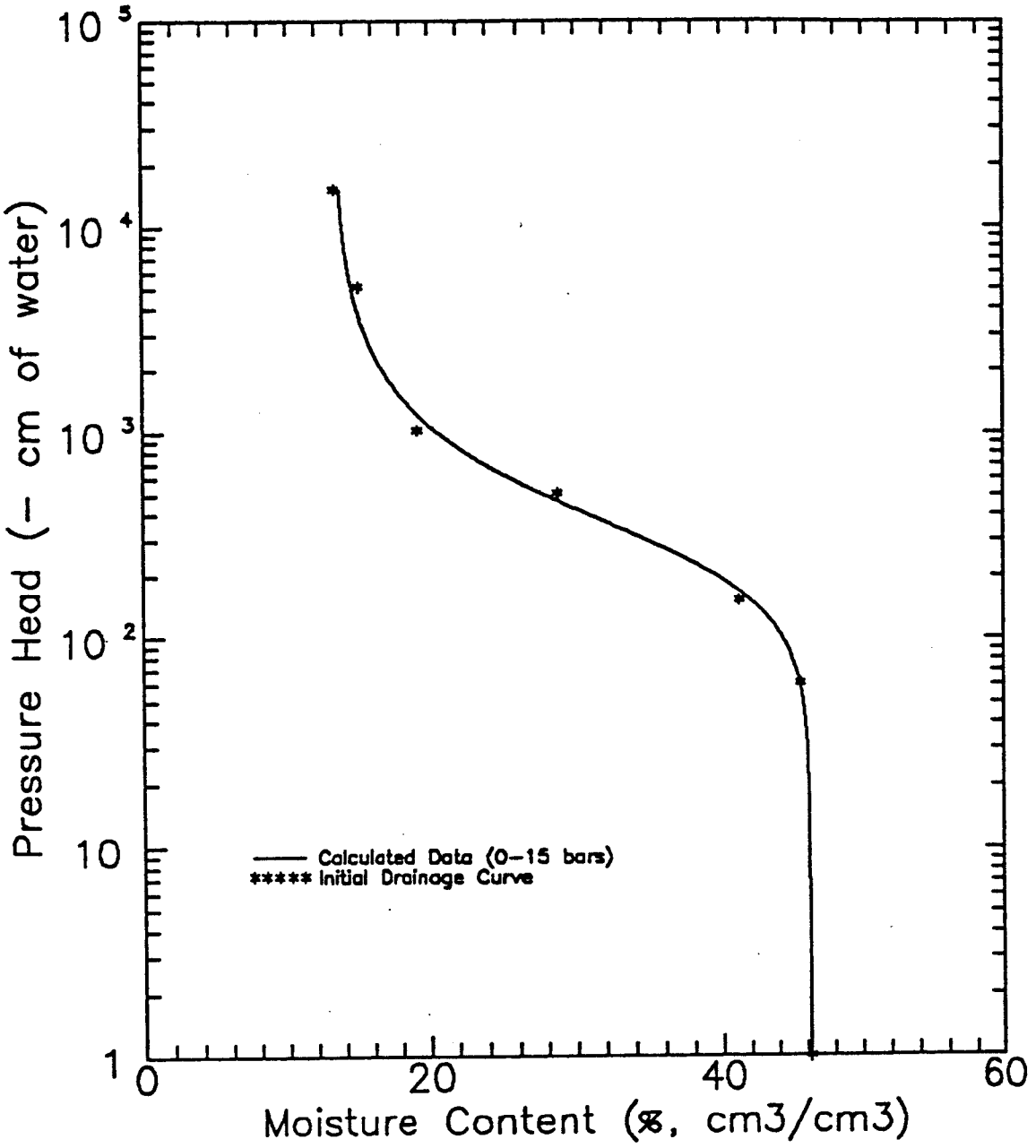
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: AB7-80
RING NUMBER: AB7-80
DEPTH: 80 FT.
SAMPLE VOLUME: 233.27 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 532.76 (g)
TARE RING: 142.87 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 25.14 (g)
DRY WEIGHT OF SAMPLE: 256.88 (g)
SATURATED MOISTURE CONTENT: 46.24 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 107.87 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES WT (g)	MOISTURE CONTENT (%, cm3/cm3)
10/04	0800	0.00	532.76	--	--	46.24
10/08	0830	0.06	531.14	1.62	1.62	45.55
10/14	1040	0.15	520.95	10.19	11.81	41.18
10/21	0715	0.50	491.93	29.02	40.83	28.74
10/24	1445	1.0	469.75	22.18	63.01	19.23
10/28	1620	5.0	460.00	9.75	72.76	15.05
11/04	1330	14.9	456.08	3.92	76.68	13.37

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: R. Hill
CHECKED BY: M. Ankeny



Pressure Head vs. Moisture Content, Sample No. AB7-80

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

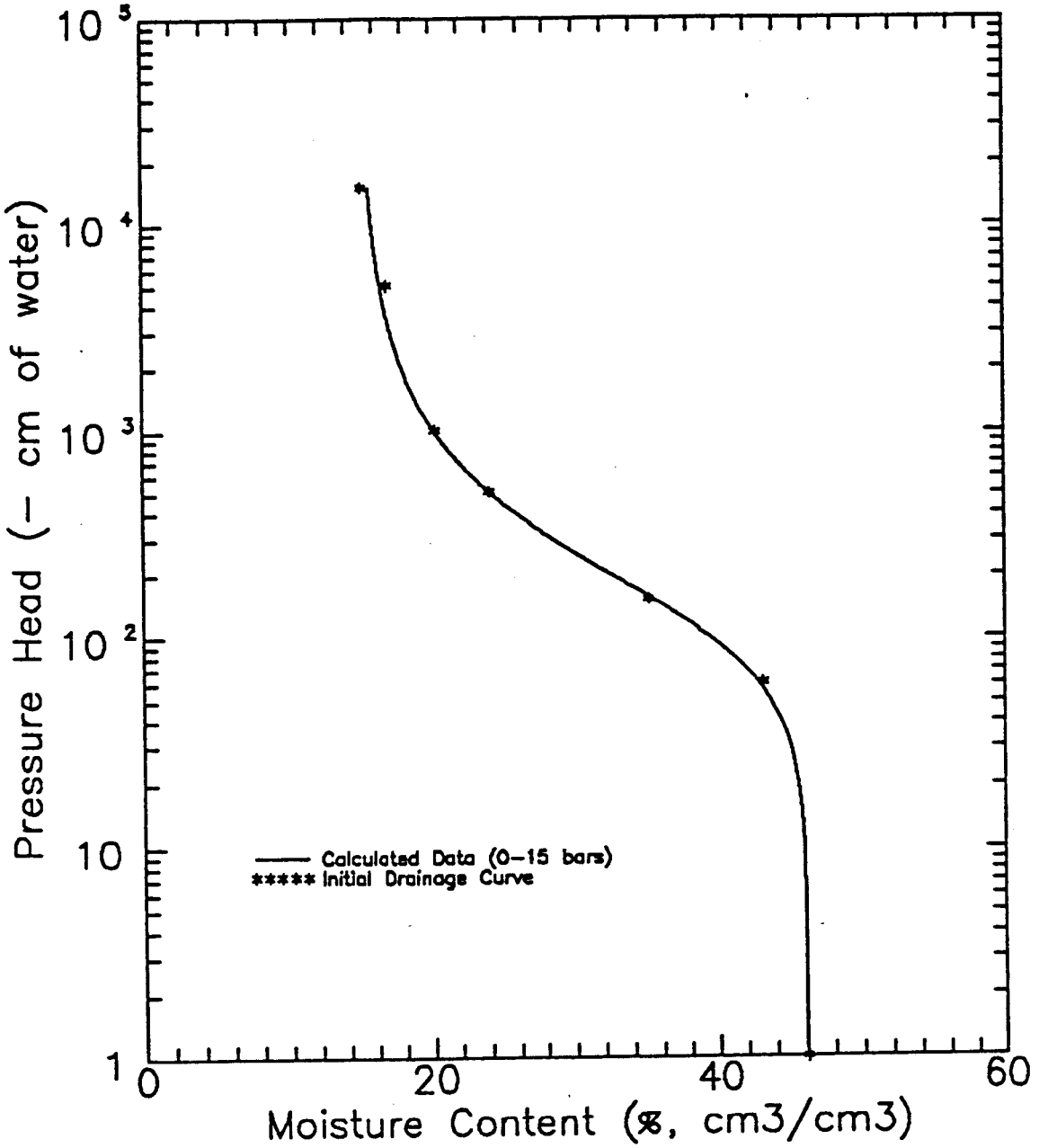
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 32.5-33.0
RING NUMBER: SIMO 1 32.5-33.0
DEPTH: 32.5-33 FT.
SAMPLE VOLUME: 208.00 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 655.06 (g)
TARE RING: 226.90 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 27.49 (g)
DRY WEIGHT OF SAMPLE: 304.95 (g)
SATURATED MOISTURE CONTENT: 46.02 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 95.72 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES WT (g)	MOISTURE CONTENT (%, cm3/cm3)
10/04	0800	0.00	655.06	--	--	46.02
10/08	0830	0.06	649.01	6.05	6.05	43.11
10/14	1040	0.15	632.29	16.72	22.77	35.07
10/21	0715	0.50	609.35	22.94	45.71	24.04
10/24	1445	1.0	601.53	7.82	53.53	20.28
10/28	1620	5.0	594.56	6.97	60.50	16.93
11/04	1330	14.9	590.91	3.65	64.15	15.18

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: R. Hill
CHECKED BY: M. Ankeny



Pressure Head vs. Moisture Content, Sample No. SIM01 – 32.5–33.0 FT.

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

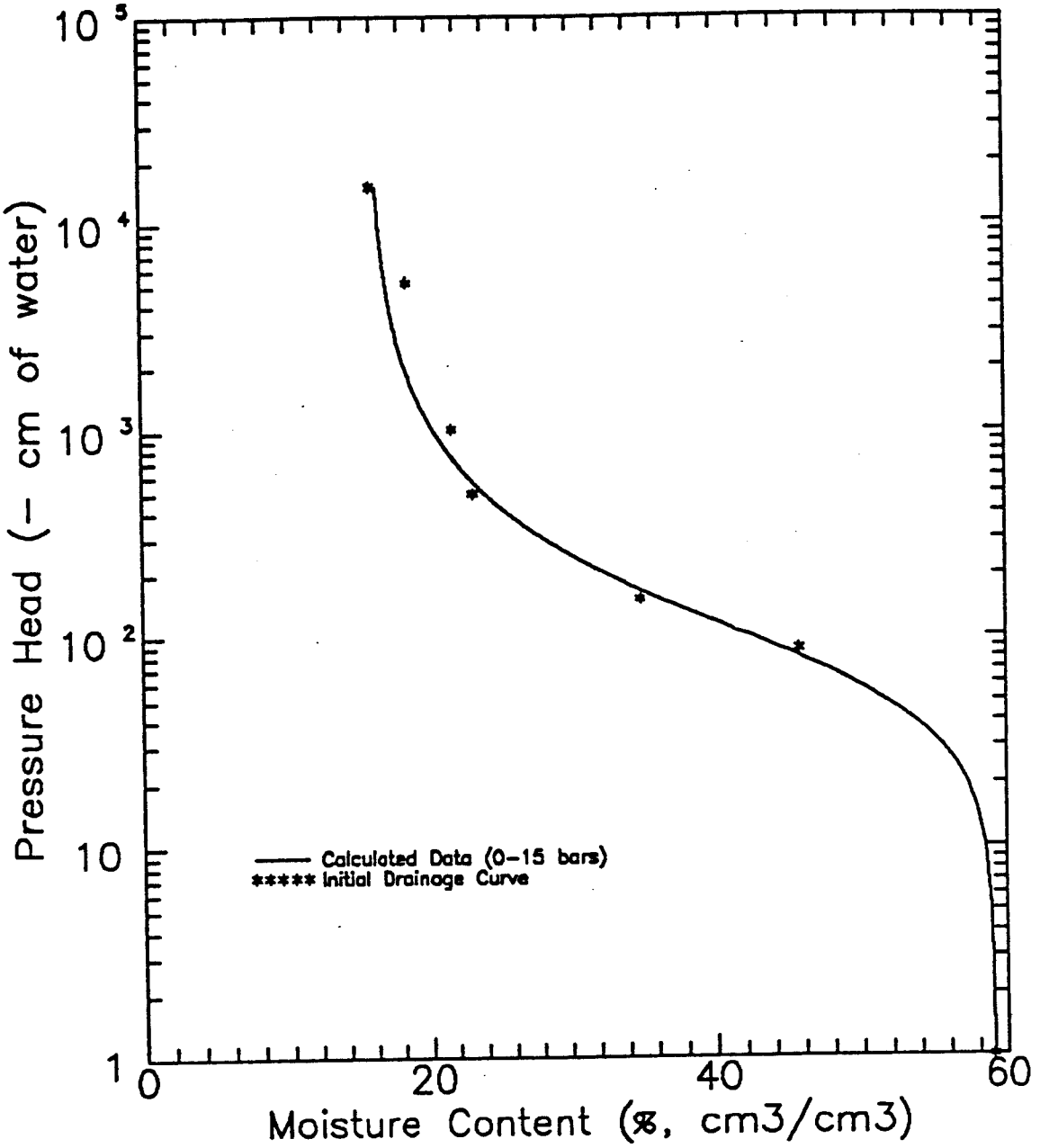
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 85.0-86.0
RING NUMBER: SIMO 1 85.0-86.0
DEPTH: 85.0-86.0 FT.
SAMPLE VOLUME: 170.00 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 537.79 (g)
TARE RING: 241.30 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 29.01 (g)
DRY WEIGHT OF SAMPLE: 167.22 (g)
SATURATED MOISTURE CONTENT: 58.98 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 100.26 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES WT (g)	MOISTURE CONTENT (%, cm3/cm3)
10/08	0800	0.00	537.79	--	--	58.98
10/14	1045	0.09	515.18	22.61	22.61	45.68
10/17	1300	0.15	496.87	18.31	40.92	34.91
10/21	730	0.49	476.91	38.27	60.88	23.16
10/24	1430	1.0	474.34	2.57	63.45	21.65
10/28	1651	5.1	469.03	5.31	68.76	18.53
11/04	1335	14.8	464.56	4.47	73.23	15.90

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: R. Hill
CHECKED BY: M. Ankeny



Pressure Head vs. Moisture Content, Sample No. SIM01 – 85–86 FT.

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

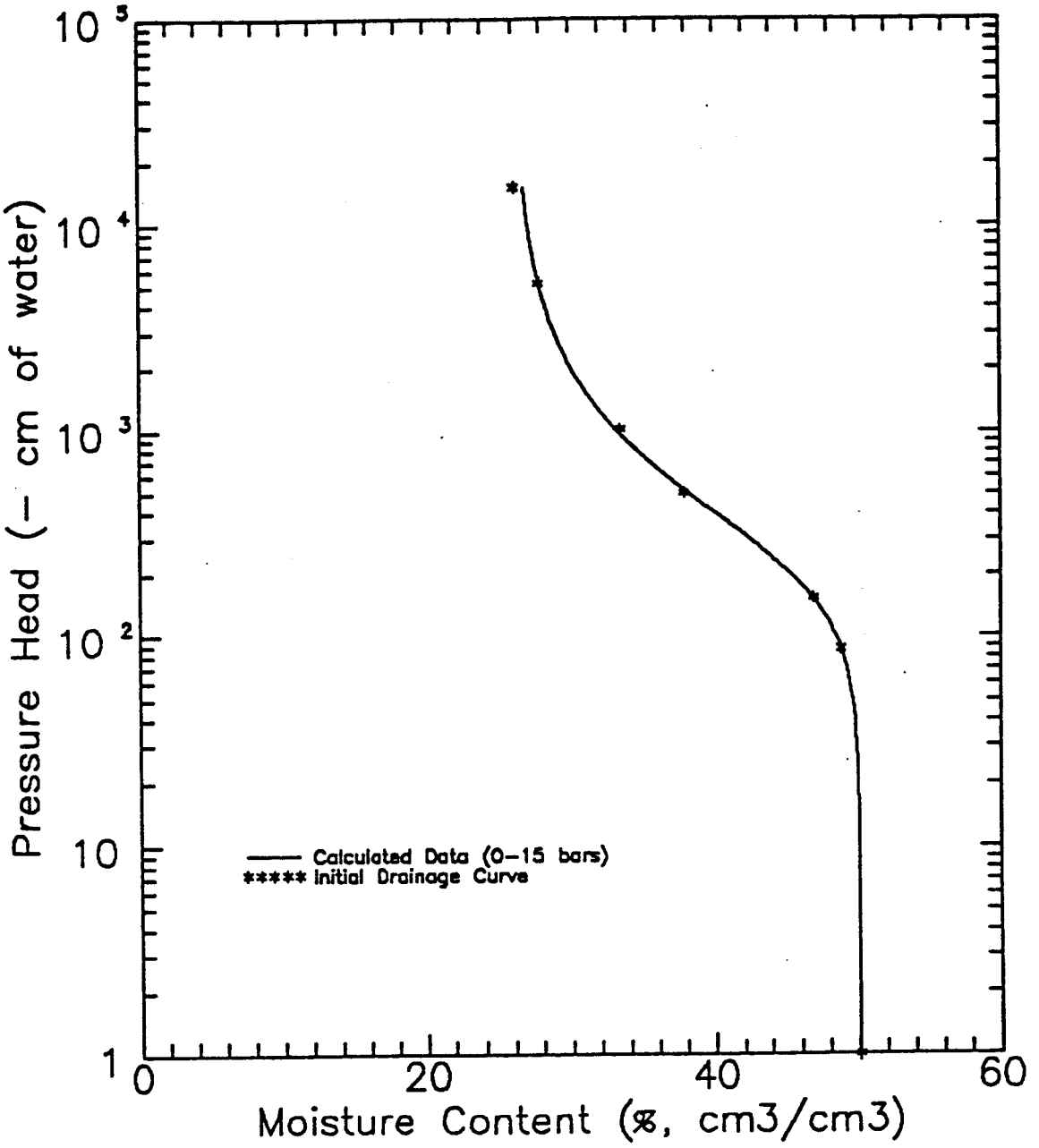
MOISTURE RETENTION DATA - 15 BAR PRESSURE PLATE
(PORE SIZE DISTRIBUTION)

JOB NAME: LANL 3
JOB NUMBER: 91-L-260
SAMPLE NUMBER: SIMO 1 89.0-90.0
RING NUMBER: SIMO 1 89.0-90.0
DEPTH: 89.0-90.0 FT.
SAMPLE VOLUME: 129.00 (cc)
SATURATED WEIGHT AT 0 CM TENSION
(WITH CAP, RING, CLAMP & SCREEN): 409.70 (g)
TARE RING: 148.16 (g)
TARE CAP: 0.00 (g)
TARE WEIGHT OF SCREEN AND CLAMP: 28.92 (g)
DRY WEIGHT OF SAMPLE: 167.99 (g)
SATURATED MOISTURE CONTENT: 50.10 (% vol)
INITIAL VOLUME OF WATER IN SAMPLE: 64.63 (cc)

DATE (1991)	TIME	PRESSURE (BAR)	WEIGHT W/RING (g)	CHANGE WT (g)	CHANGES WT (g)	MOISTURE CONTENT (%, cm3/cm3)
10/08	0800	0.00	409.70	--	--	50.10
10/14	1045	0.09	408.02	1.68	1.68	48.80
10/17	1300	0.15	405.57	2.45	4.13	46.90
10/21	730	0.49	393.92	14.10	15.78	37.87
10/24	1430	1.0	388.19	5.73	21.51	33.43
10/28	1651	5.1	381.02	7.17	28.68	27.87
11/04	1335	14.8	378.83	2.19	30.87	26.17

COMMENTS: Assume density of water is 1.0 g/cc

LABORATORY ANALYSIS PERFORMED BY: R. Hill
CALCULATION MADE BY: R. Hill
CHECKED BY: M. Ankeny



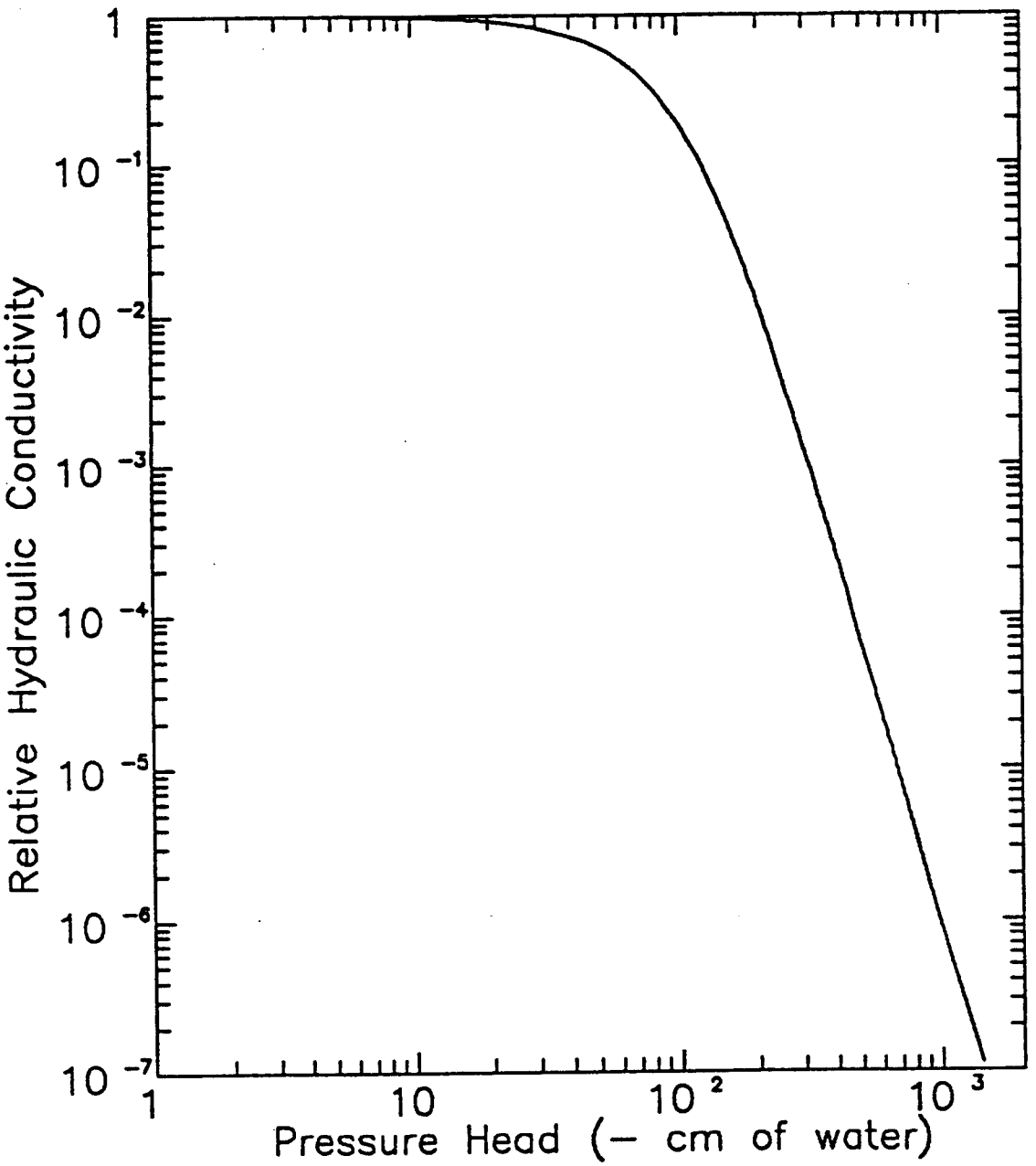
Pressure Head vs. Moisture Content, Sample No. SIM01 - 89-90 FT.

APPENDIX D

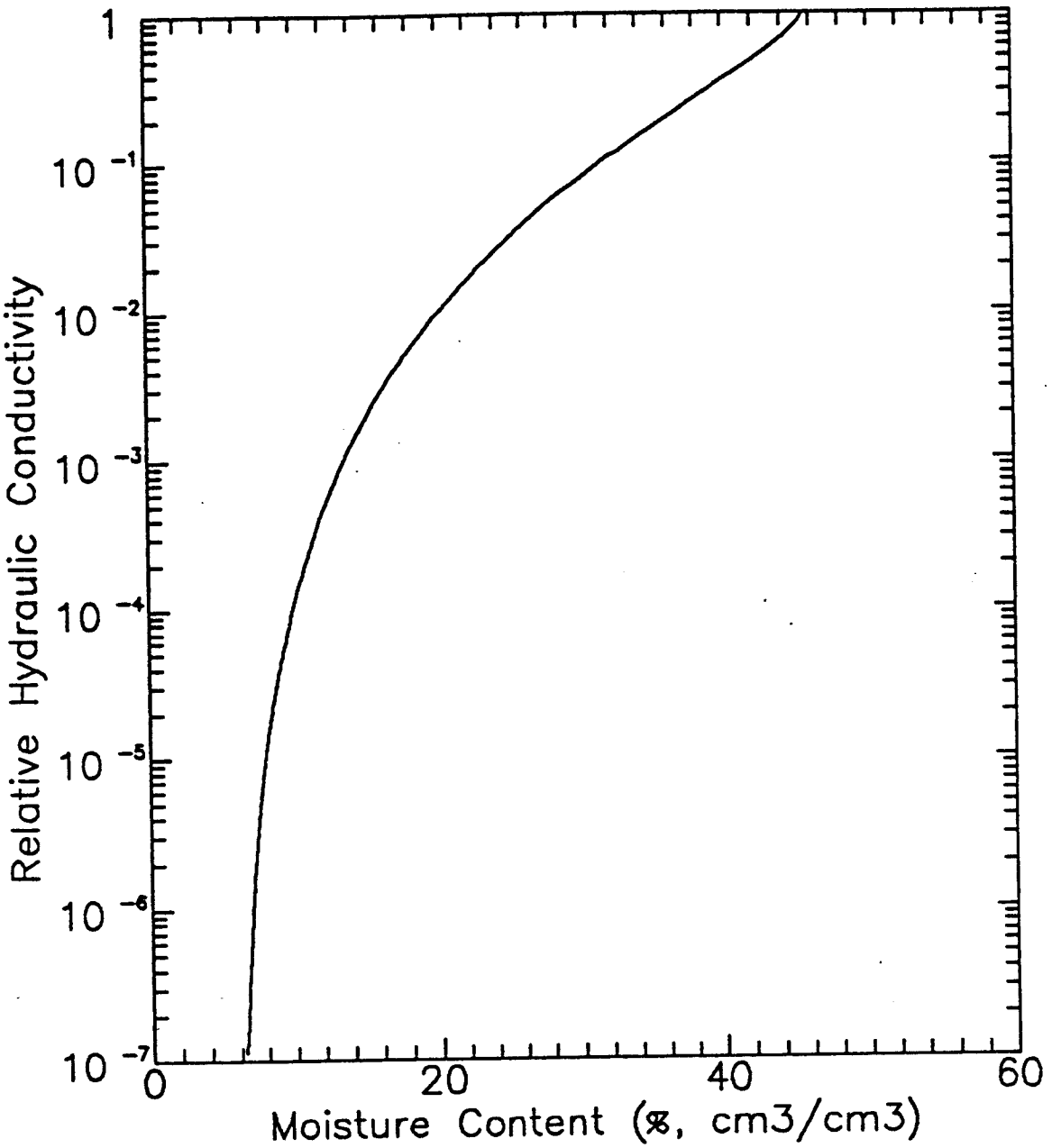
UNSATURATED HYDRAULIC CONDUCTIVITY

SUMMARY OF UNSATURATED HYDRAULIC PROPERTIES (CALCULATED)

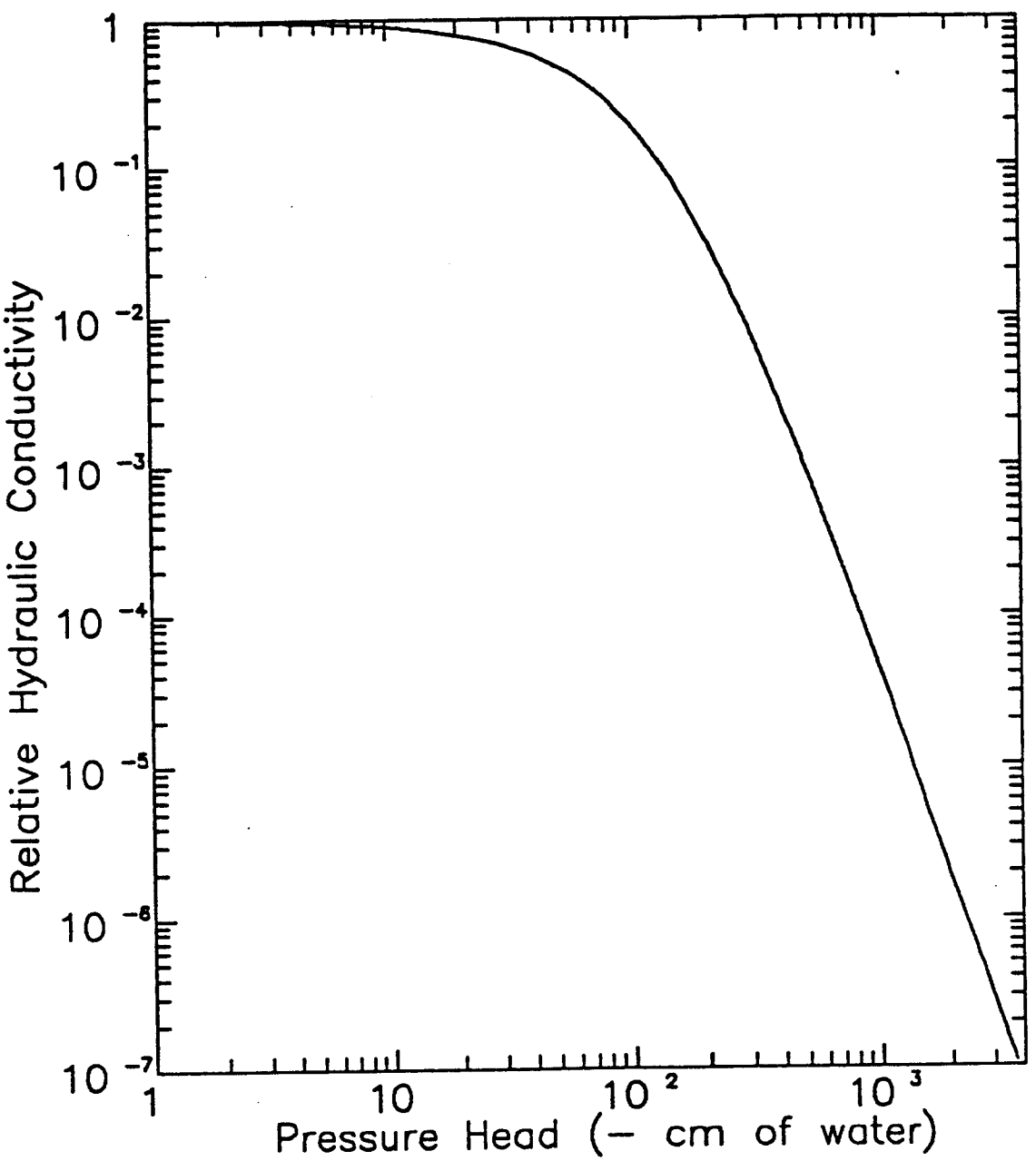
SAMPLE NUMBER	α (cm^{-1})	N (dimensionless)	θ_r (%, cm^3/cm^3)	θ_s (%, cm^3/cm^3)	K_{sat} (cm/sec)
AB-6-40	0.00817	2.67099	5.7	45.5	3.7×10^{-4}
AB-6-60	0.00656	2.04344	6.0	48.1	3.5×10^{-3}
AB-6-100	0.00988	1.67448	11.1	48.5	8.8×10^{-4}
AB-6-110	0.00258	2.68146	5.3	42.7	7.4×10^{-5}
AB-6-150	0.00213	2.01017	7.9	46.7	6.1×10^{-5}
AB-7-70	0.00447	2.05814	13.7	46.0	1.7×10^{-4}
AB-7-80	0.00369	2.13599	13.4	46.2	2.2×10^{-4}
SIMO-1 32.5-33.0	0.00814	1.85590	15.2	46.0	2.7×10^{-4}
SIMO-1 85.0-86.0	0.01398	1.85470	15.9	59.0	2.0×10^{-4}
SIMO-1 89.0-90.0	0.00381	1.89216	26.2	50.1	1.1×10^{-5}



Relative Hydraulic Conductivity vs. Pressure Head, Sample No. AB6–40



Relative Hydraulic Conductivity vs. Moisture Content, Sample AB6-40



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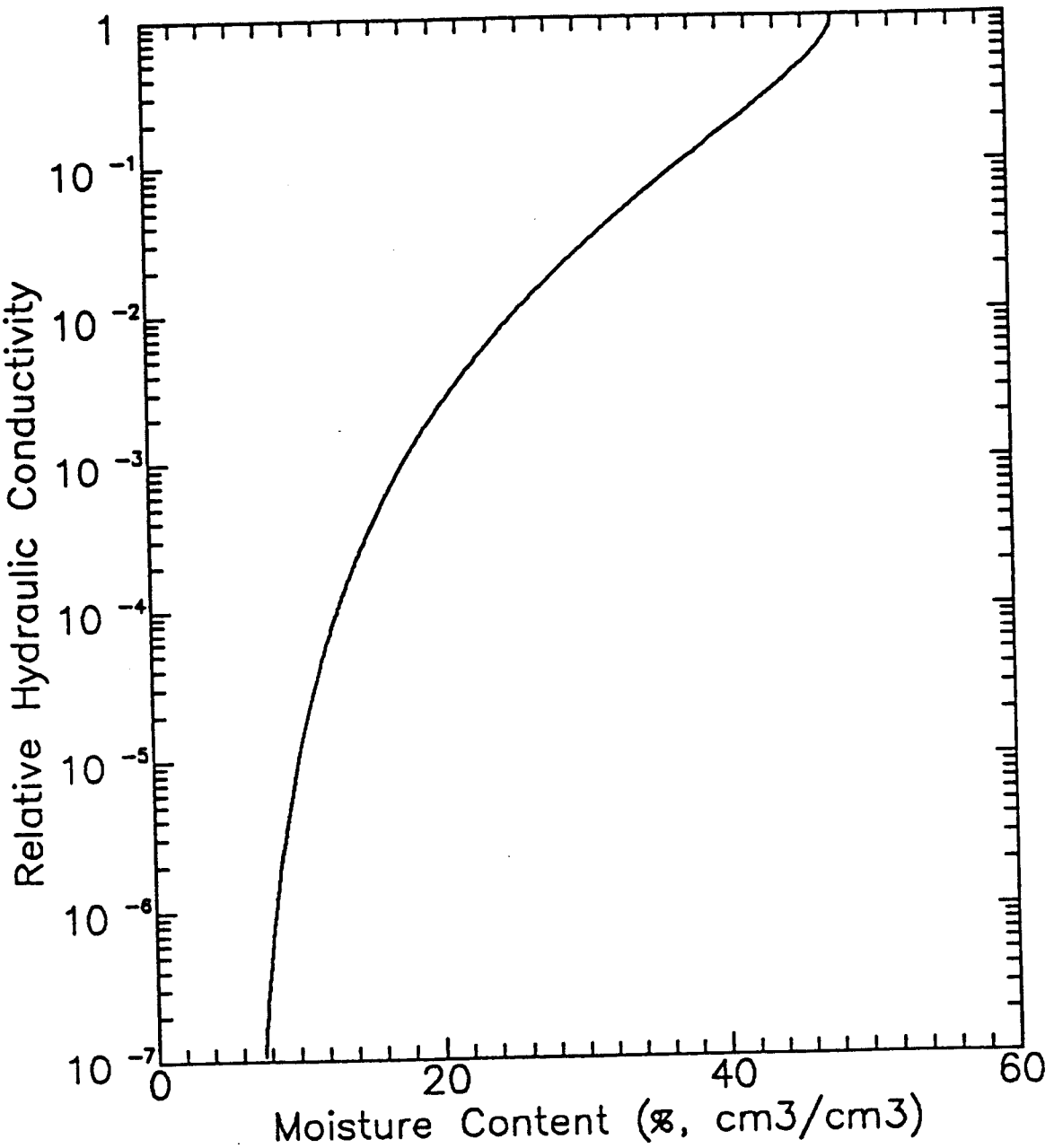

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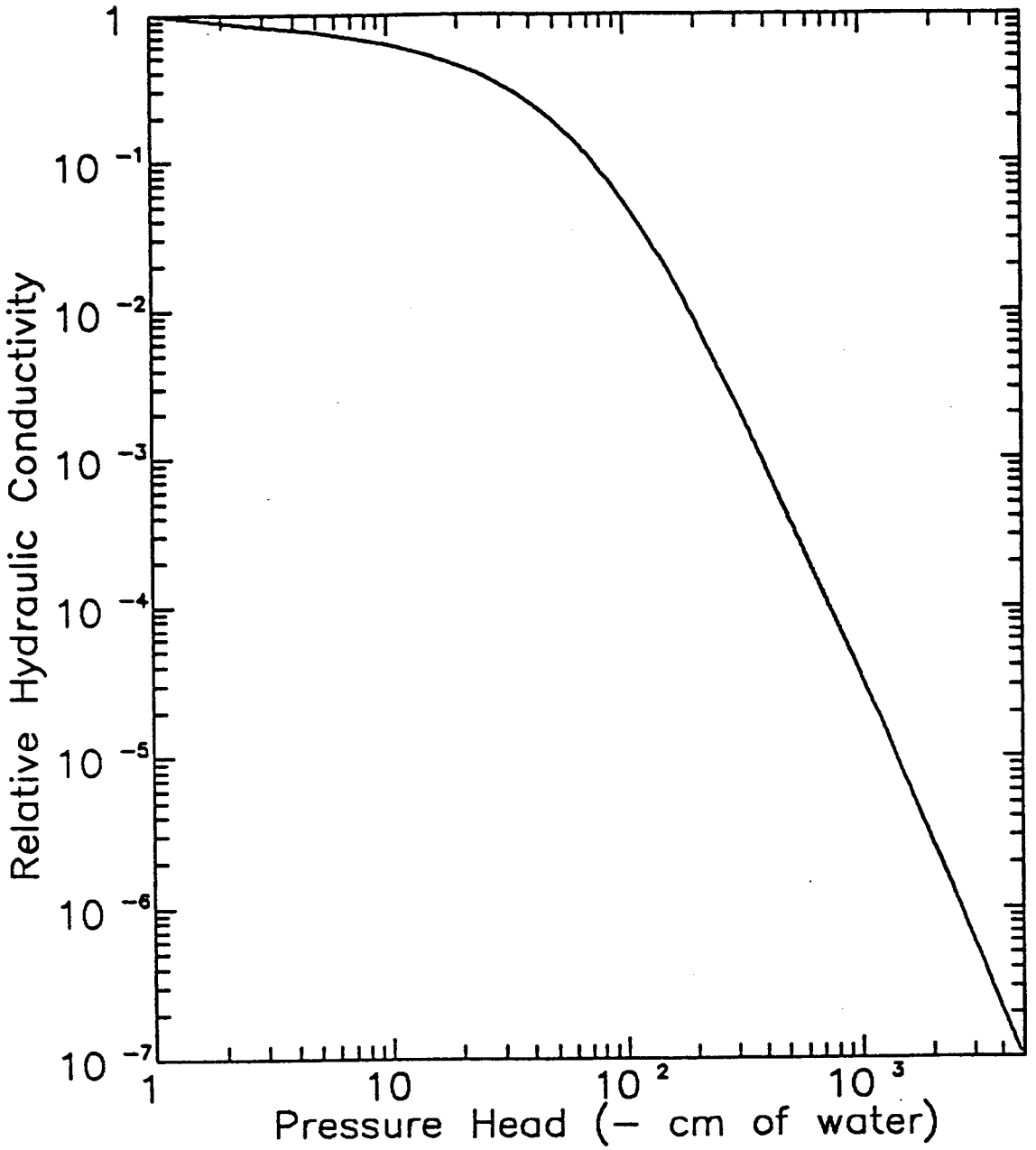

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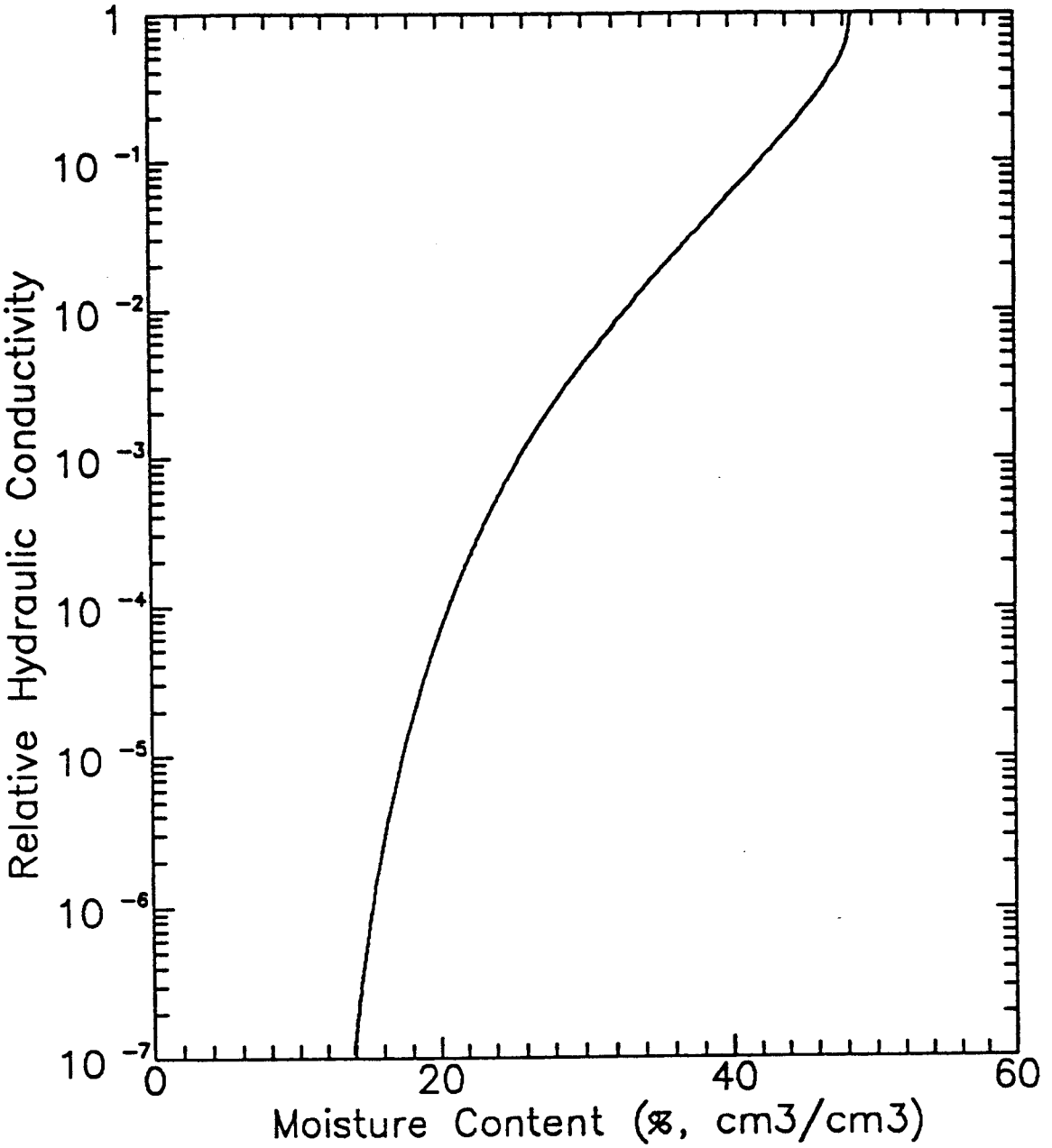

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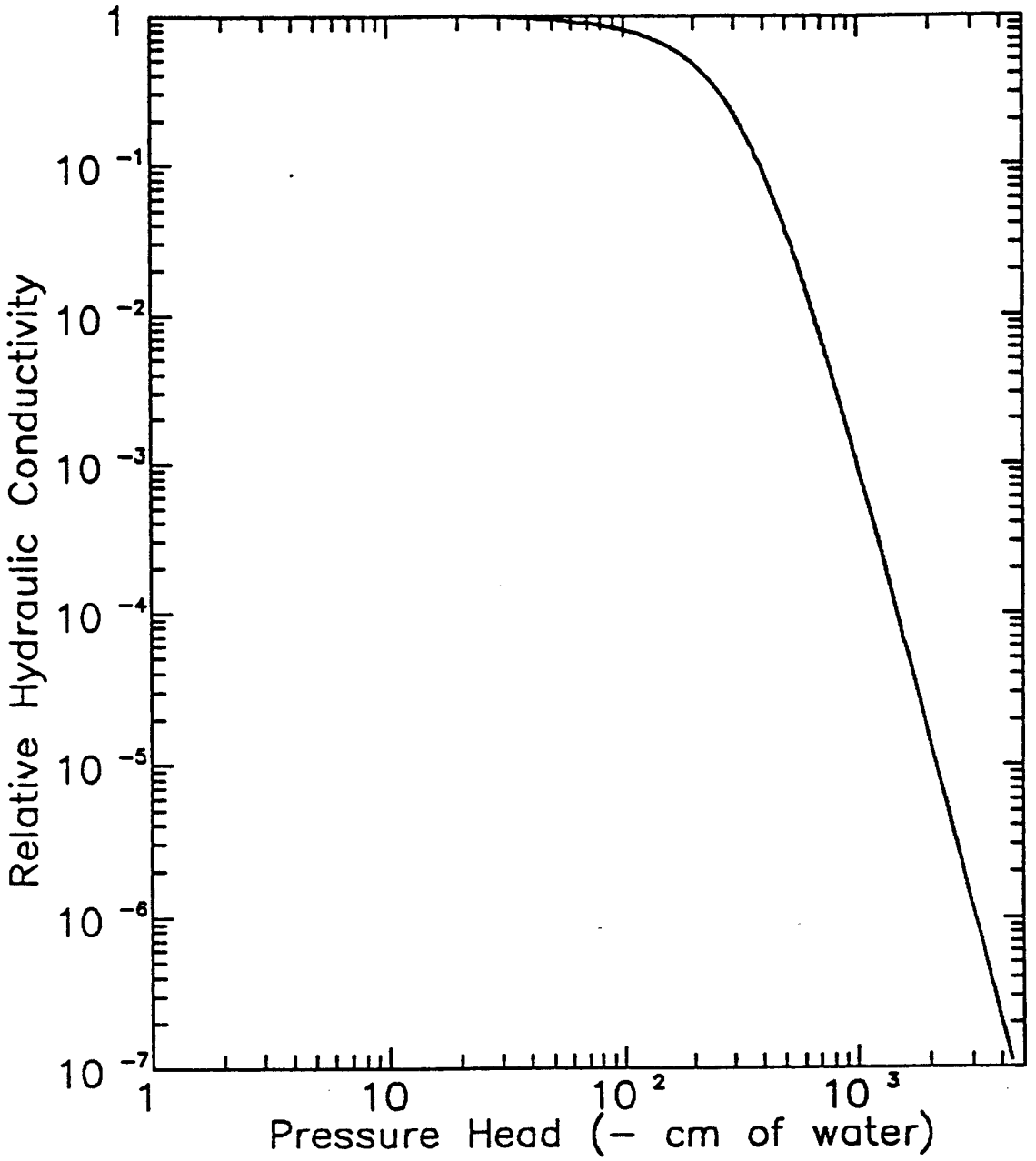

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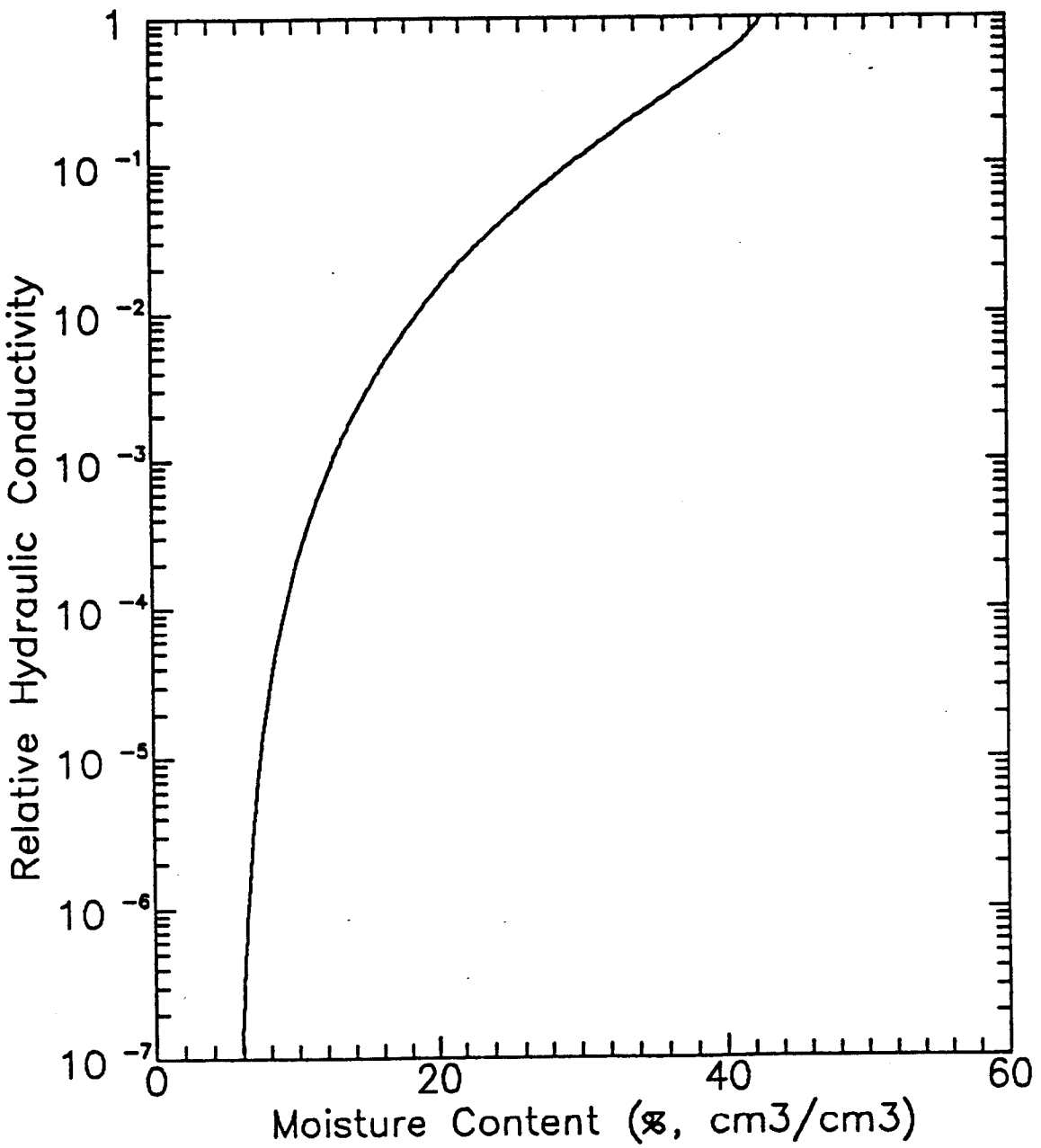

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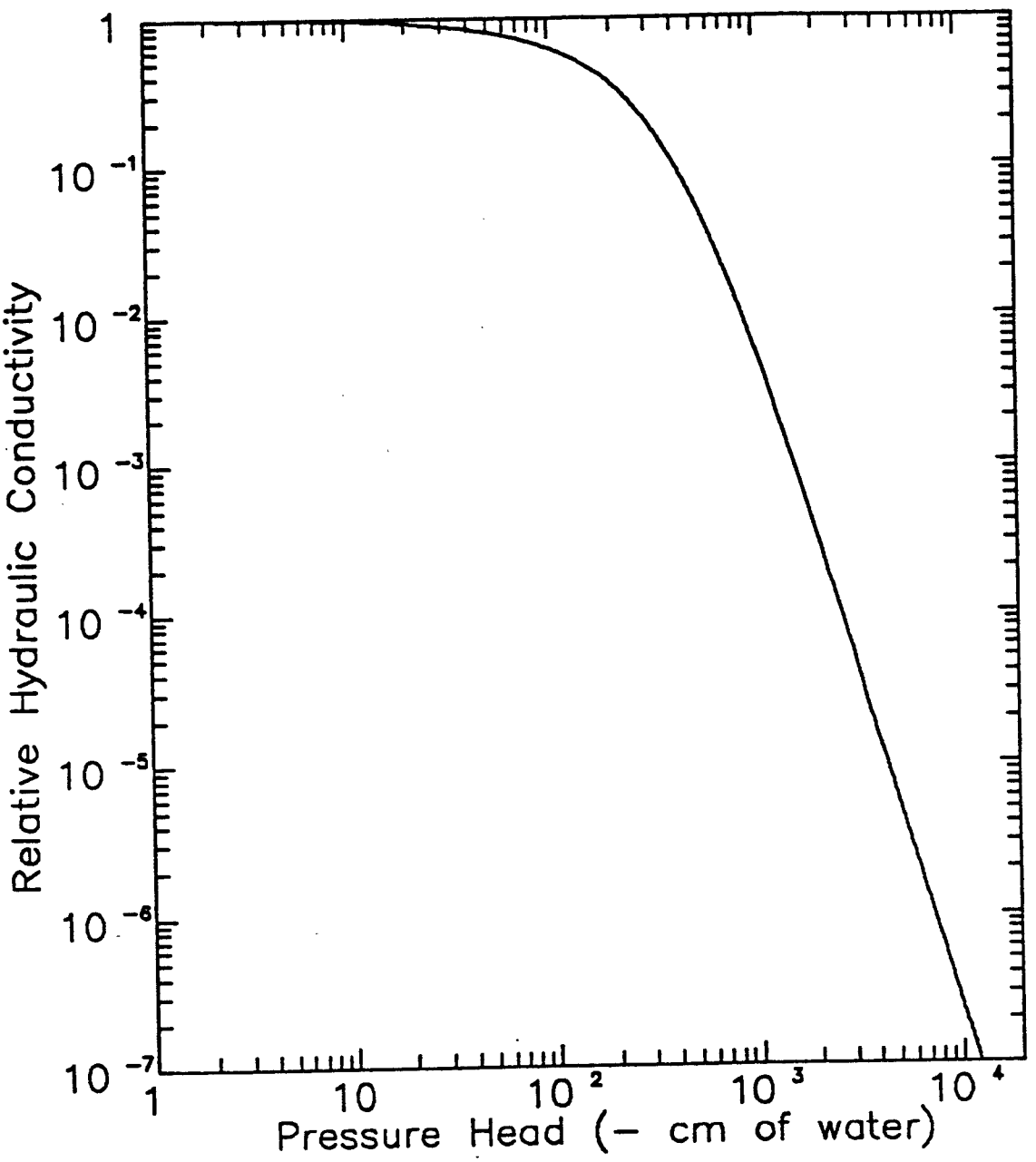

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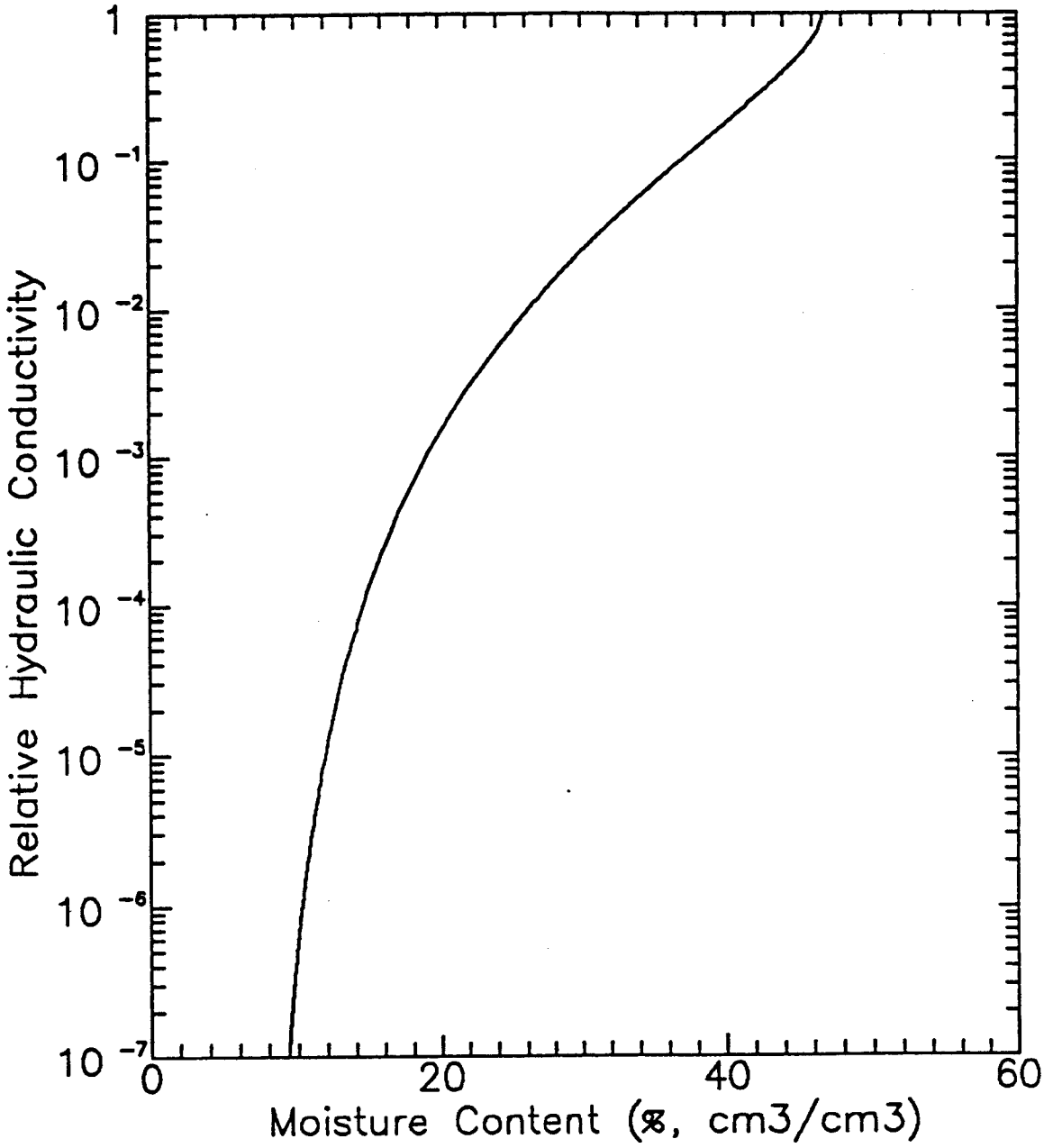

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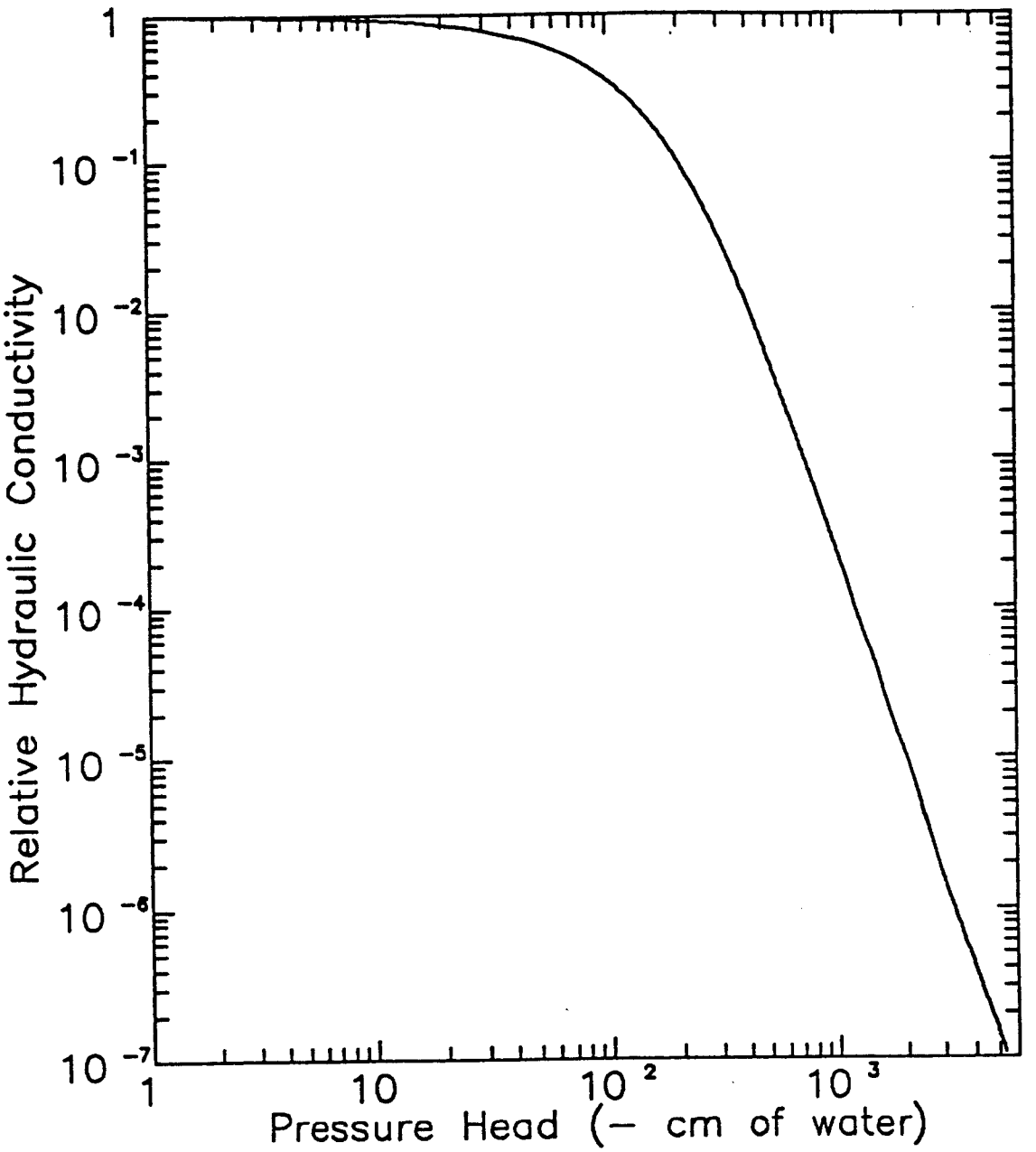

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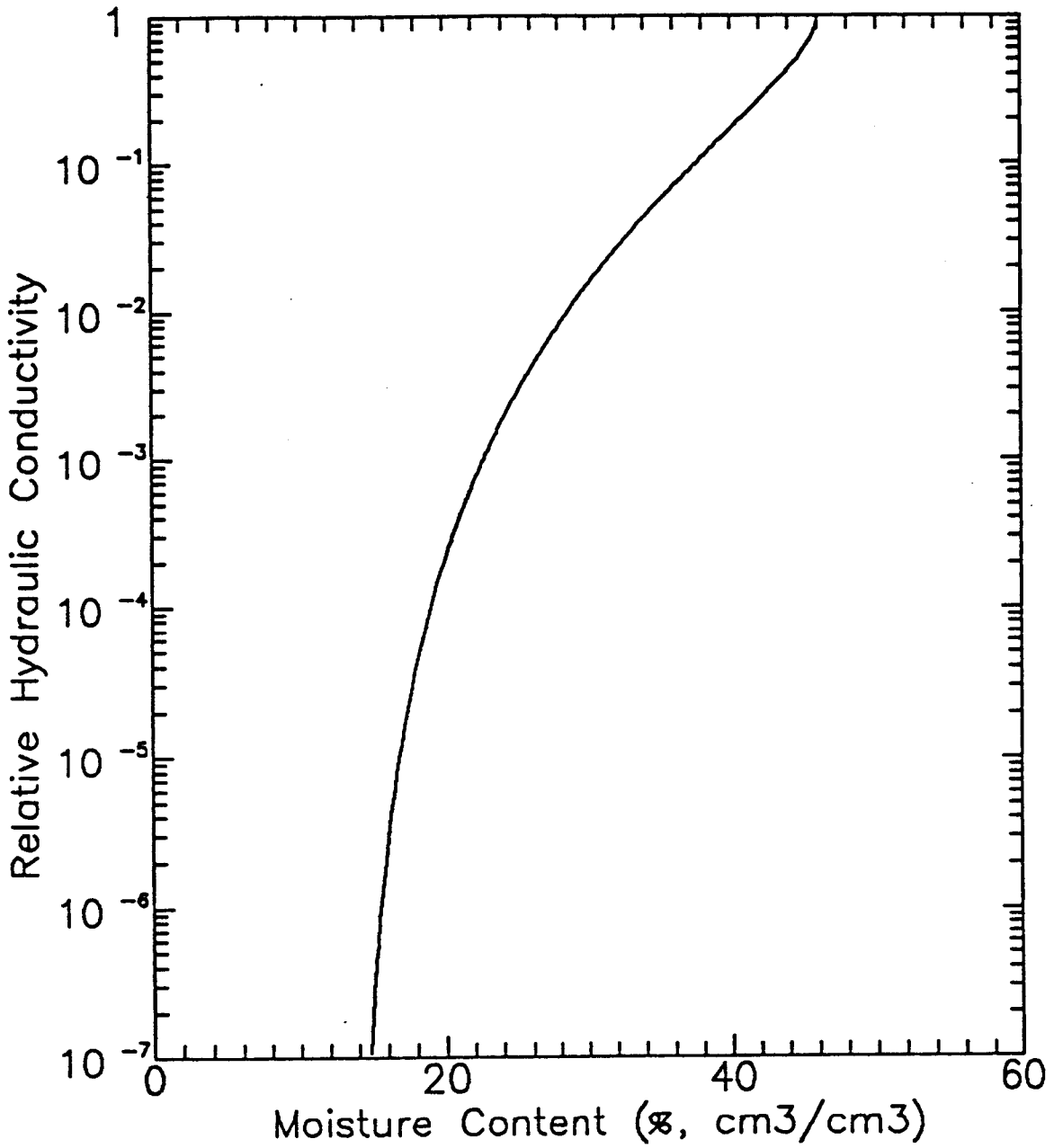

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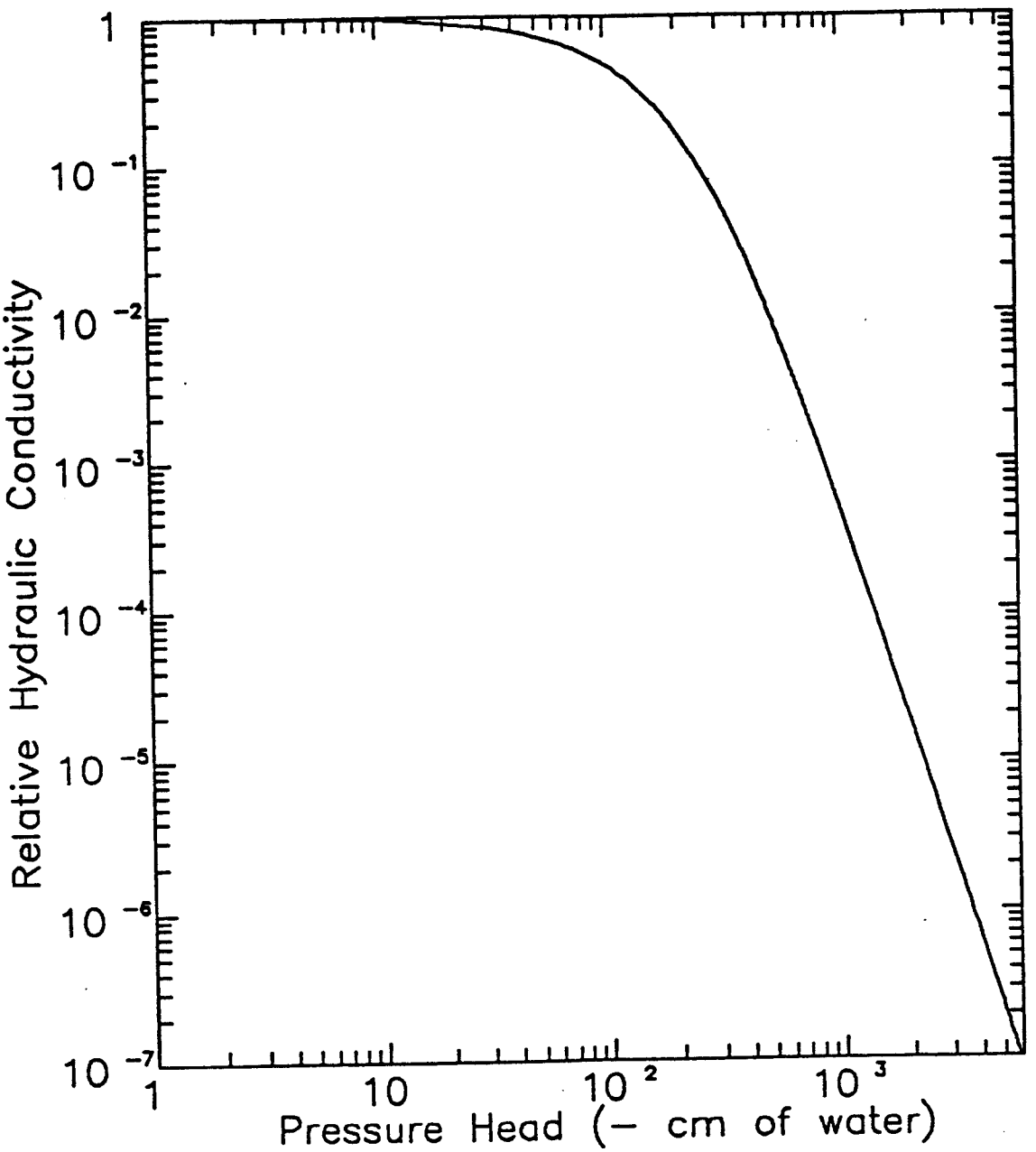

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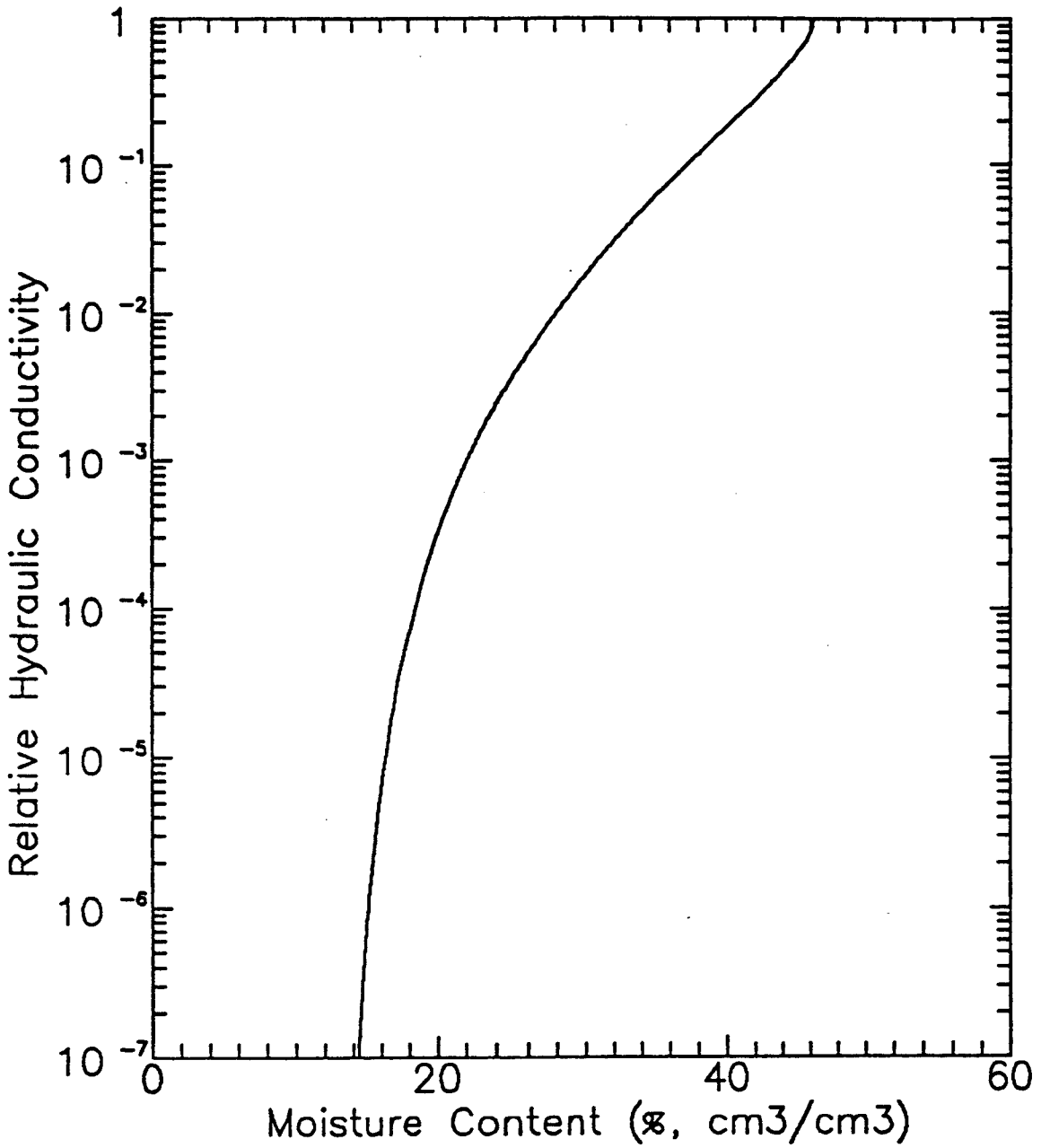

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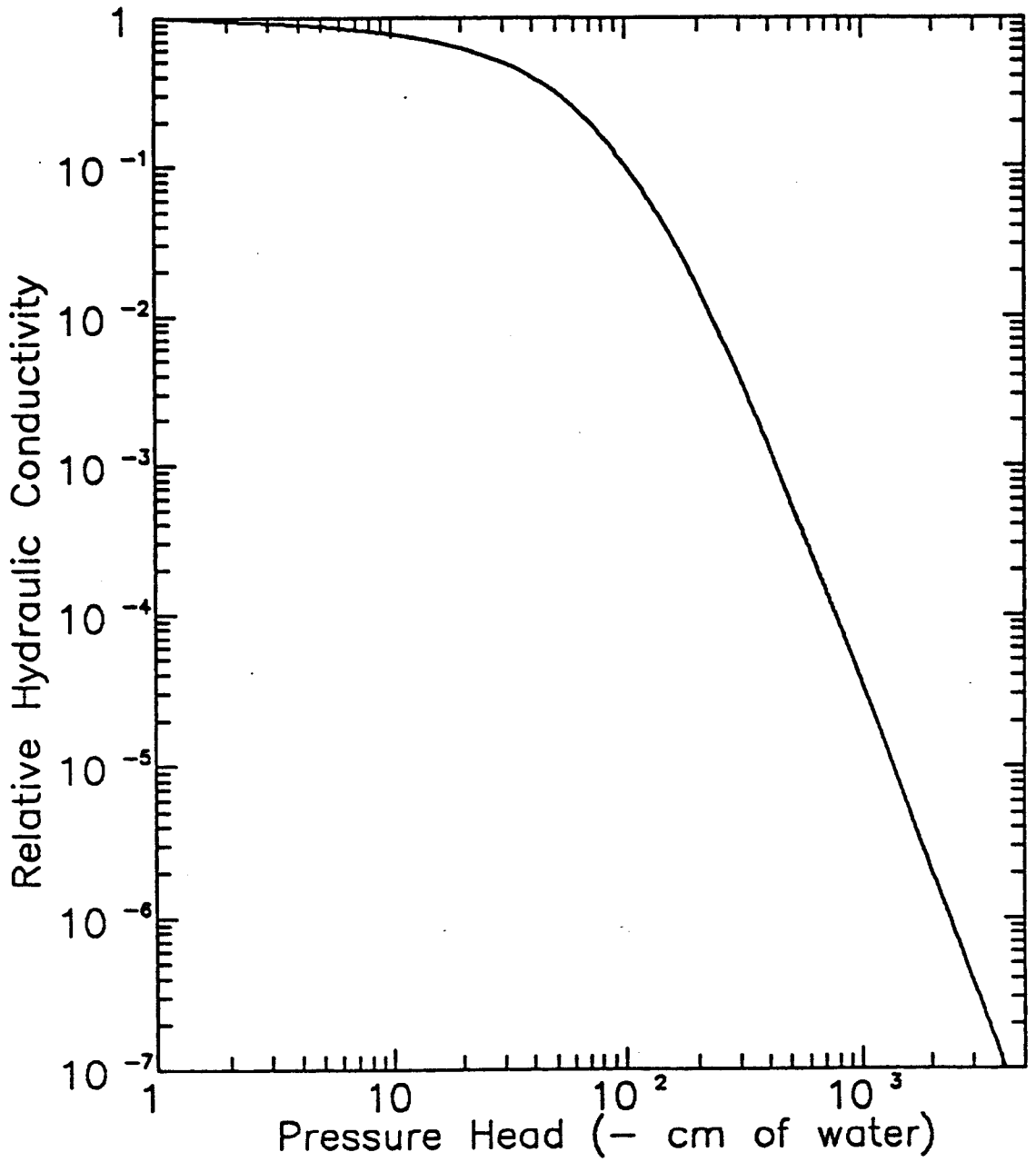

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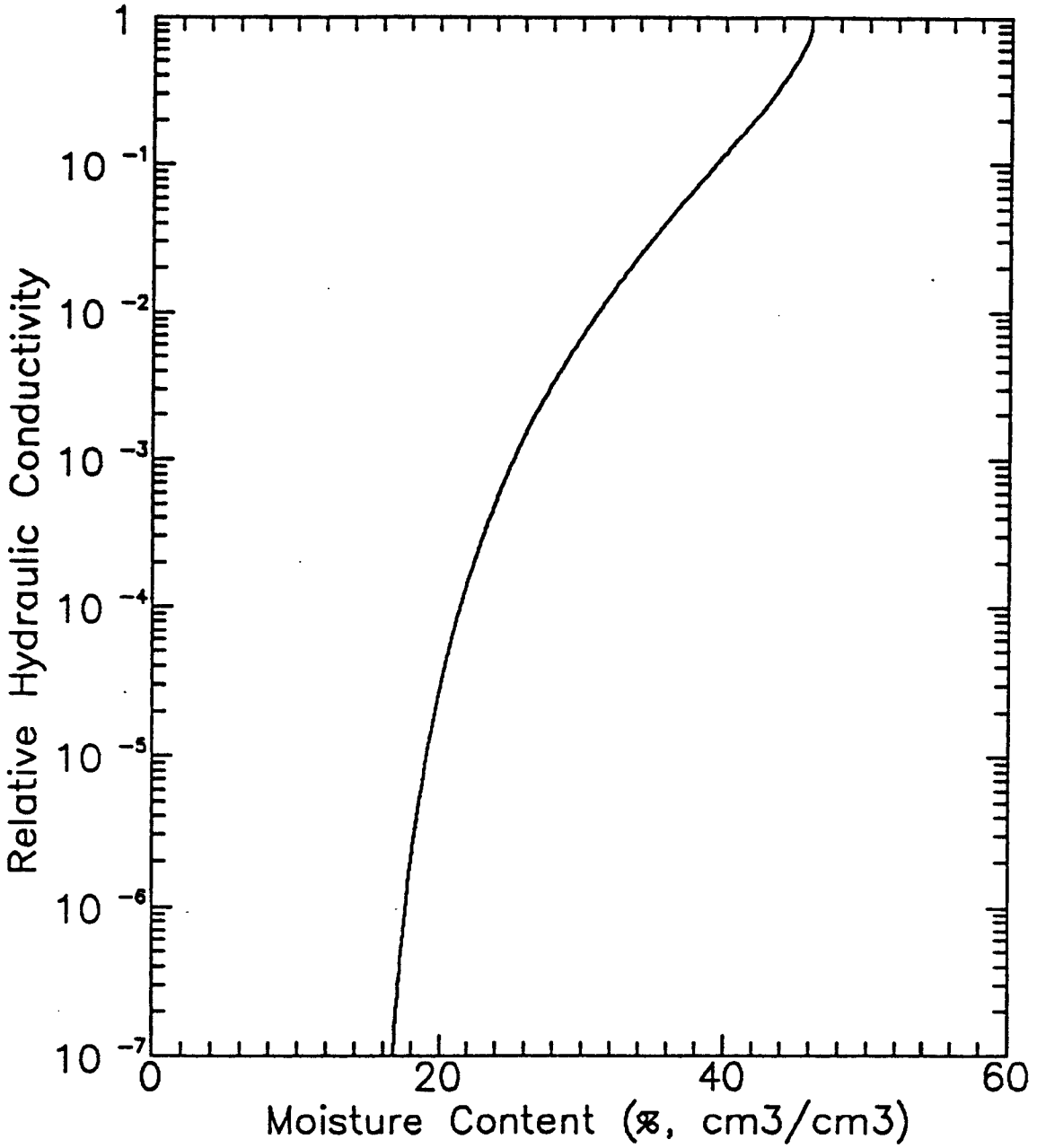

Relative Hydraulic Conductivity vs. Moisture Content, Sample SIM01 32.5–33.0

APPENDIX H

RCRA CONTINGENCY PLAN FOR MIXED WASTE UNITS

Project No. 301215.01.03.02
May 1992

RCRA Contingency Plan For Mixed Waste Units

Los Alamos National Laboratory
Environmental Protection Group
Los Alamos, New Mexico 87545

Prepared by:

International Technology Corporation
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LIST OF ACRONYMS

ADO	Associate Director of Operations
CAS	Central Alarm Station
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EM	LANL Environmental Management Division
EOC	Emergency Operations Center
EMO	Emergency Management Office
EPA	U.S. Environmental Protection Agency
ERC	Emergency Response Coordinator
ERP	LANL Emergency Response Plan
HAZMAT Team	Hazardous Materials Response Team
HE	High Explosive
HS	LANL Health and Safety Division
HWMR	State of New Mexico Hazardous Waste Management Regulations
ICG	Incident Control Group
JCI	Johnson Controls World Services Inc.
LAAO	Los Alamos Area Office
LAFD	Los Alamos Fire Department
LAMC	Los Alamos Medical Center
LANL	Los Alamos National Laboratory
LAPD	Los Alamos Police Department
M	Dynamic Testing Division
MAT	Materials Management Division
NAWAS	National Warning System
NMED	New Mexico Environment Department
NMT	Nuclear Materials Technology
OSHA	Occupational Safety and Health Administration
PA	Public Address

LIST OF ACRONYMS
(Continued)

PTLA	Protection Technology Los Alamos
RCRA	Resource Conservation and Recovery Act
REA	Radiological Emergency Assistance
SOP	Standard Operating Procedure
TA	Technical Area
TRU	Transuranic
TSDF	Treatment, Storage, and Disposal Facility
WX	Design Engineering Division

CONTINGENCY PLAN
FOR MIXED WASTE UNITS

1.0 INTRODUCTION

This document presents contingency measures for mixed waste treatment and storage units at Los Alamos National Laboratory (LANL). The document is written in accordance with the requirements of New Mexico Hazardous Waste Management Regulations-6 (HWMR-6), Part VI, which adopt 1990 Code of Federal Regulations Title 40 (40 CFR) Part 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDFs). Contingency plan requirements are specified in 40 CFR Part 264 Subpart D, Contingency Plan and Emergency Procedures. This document is consistent with the LANL Emergency Response Plan (ERP), prepared by the Laboratory's Emergency Management Office (EMO). The ERP incorporates emergency planning and preparedness strategies from Department of Energy (DOE) Order 5500.3A, "Emergency Planning and Preparedness for Operational Emergencies." This Contingency Plan is intended to meet contingency plan and emergency procedure requirements set forth in 40 CFR Part 264 Subpart D for Resource Conservation and Recovery Act (RCRA) TSDFs. It should be noted, however, that regulations promulgated by the Occupational Safety and Health Administration (OSHA) in 29 CFR 1910.120 will also be met by LANL, when applicable. The provisions of this plan will be carried out immediately whenever there is a fire, explosion, or release of mixed waste or mixed waste constituents that could threaten human health or the environment.

1.1 SITE DESCRIPTION

LANL and the residential communities of Los Alamos and White Rock are located in north central New Mexico on the Pajarito Plateau, situated west of the Rio Grande on the eastern slopes of the Jemez Mountains. The LANL facility covers approximately 111 square kilometers (27,500 acres) in and adjacent to Los Alamos County, and includes 34 active Technical Areas (TAs).

The principal mission of LANL is the application of science and technology to solve national problems including weapons development, energy supply, and conservation programs, while basic scientific research complements and strengthens its fundamental technical capabilities. LANL is owned by the DOE, and co-operated by DOE and the University of California.

1.2 MIXED WASTE

Mixed waste contains both a hazardous waste, as defined by and regulated under RCRA, and a radioactive waste. The mixed waste generated at LANL is comprised of three general types:

- Waste from research and development [this includes, but is not limited to, spent laboratory solvents, discarded equipment, and high explosive (HE) mixed waste]
- Waste from process operations
- Waste from decontamination and decommissioning projects

Mixed waste generated at LANL is either transuranic (TRU) mixed waste or low-level mixed waste. TRU waste is defined in DOE Order 5820.2A, "Radioactive Waste Management," as waste containing alpha-emitting transuranic radionuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram at the time of assay, without regard to source or form. Low-level waste is defined in DOE Order 5820.2A as "waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel, or 11e(2) byproduct material as defined by this Order." High-level waste is defined in DOE Order 5820.2A as waste material resulting from the reprocessing of spent nuclear fuel. No high-level waste is generated at LANL. Byproduct material, as defined in Section 11e(2) of the Atomic Energy Act of 1954, as amended, consists of uranium and thorium mill tailings; 11e(2) byproduct material is not generated at LANL.

Overall responsibility for mixed waste management resides with the Environmental Management (EM) Division Waste Management Group (EM-7). EM Division's organizational structure is shown on Figure 1. Generators of mixed waste are responsible for proper identification, segregation, and documentation of their waste. Generators with mixed waste storage or treatment units in their operating area are responsible for management of those units. Except for HE mixed waste and classified mixed waste, on-site packaging, transportation, and greater-than-90-day storage of mixed waste are the responsibility of EM-7. HE mixed waste is handled by the Dynamic Testing (M) and Design Engineering (WX) Divisions, whose research areas are the design and testing of explosives.

Mixed waste storage and treatment units in operation at LANL are summarized in Table 1. The location of each of the units is shown on Figure 2. Mixed waste units at LANL include container storage areas, surface impoundments, storage tanks, a controlled air incinerator, cementation units for process residue, an oxygen sparging unit for pyrophoric mixed waste, and two detonation units for HE mixed waste. TRU mixed waste is stored at TA-3, TA-54 (Area G), and

TA-55. Low-level mixed waste is stored at most mixed waste units. Solid mixed waste types include lead shielding, decommissioned gloveboxes and equipment, and cemented process residue. Spent solvents and laboratory reagents, analytical solutions, combustible liquids, and aqueous process waste comprise the liquid mixed waste types. Additionally, compressed gases are a third type of mixed waste handled at LANL.

2.0 MIXED WASTE EMERGENCY RESPONSE RESOURCES

The primary resources for management of emergency incidents at LANL reside within the Emergency Management Office (EMO), which is part of the Associate Director of Operations (ADO) Office. During an emergency situation, line management (i.e., the group leader of the affected area) works with the designated Emergency Manager from the EMO who assumes the primary responsibility for managing emergency response operations.

Outside of LANL, contracted services and other agencies are also available for assistance during emergencies. These include the contracted services of Protection Technology Los Alamos (PTLA) (security) and Johnson Controls World Services Inc. (maintenance), the Los Alamos Fire Department and Police Department, and the Los Alamos Medical Center.

All response groups and agencies called upon during emergencies are coordinated by the designated Emergency Manager. The emergency notification procedure is illustrated on Figure 3. The responsibilities and/or assistance available from the response groups/agencies are listed in Table 2 and discussed briefly in the following sections. Each of the emergency response groups/agencies shall retain a current copy of this Contingency Plan.

2.1 EMERGENCY MANAGEMENT OFFICE

The Director of LANL has delegated the authority and responsibility for administering and implementing the Laboratory's emergency management program to the ADO. The EMO is included within the ADO office. The EMO coordinates and issues the Laboratory's Emergency Response Plan and provides response coordination for emergencies. The EMO also provides a 24-hour Emergency Manager to respond to emergencies, including mixed waste releases, and an Emergency Response Coordinator (ERC) to coordinate Health and Safety and Environmental Management personnel and resources. Additionally, the EMO maintains the Emergency Operation Center (EOC) in a ready condition, should the center be required. The primary EOC is located at TA-59-1; an alternate EOC is located at TA-49-113.

An Emergency Manager and an ERC will respond to emergency incidents involving the release of mixed waste to the environment, including spills, fires, or explosions. The Emergency Manager will initially assess the possible hazards to human health or the environment, and use whatever response group(s) or emergency equipment needed to control and contain the waste. In the event of an emergency, the Emergency Manager becomes the Incident Commander with full responsibility for all response actions. At the scene of the emergency, an Incident Control

Group (ICG) will form which consists of responding emergency personnel who report to the Incident Commander. The ICG works together to take command and control of emergency situations.

EMO personnel designated as Emergency Managers are listed in Table 3. Assignment as the designated Emergency Manager is rotated. The Emergency Manager can be reached by contacting the EMO (667-6211 during working hours, 667-7080 after working hours) or the Central Alarm Station (CAS) dispatcher (9-911).

If an emergency situation occurs at the HE mixed waste detonation units at TA-15 or TA-36, the Emergency Manager may employ the expertise of WX and M Division personnel. These divisions have developed Standard Operating Procedures (SOPs) based on safe handling practices to minimize the risk of uncontrolled fires and explosions. SOPs that address emergency management for firing mound and firing operations include SOP M-8-4, Version E, and SOP M-8-5, Version E.

The ERC is called out by and reports to the Incident Commander. In the event of an emergency, the ERC is responsible for coordinating the Hazardous Materials Response (HAZMAT) Team, Radiological Emergency Assistance (REA) Team, and other related Health and Safety and Environmental Management personnel and resources.

2.2 HEALTH AND SAFETY (HS) DIVISION RESPONSE GROUPS

LANL maintains its own response forces within the HS Division to handle emergencies. These response groups include:

- Health Physics Operations (HS-1)
- Occupational Medicine (HS-2)
- Risk Management Support (HS-3)
- Industrial Safety and Hygiene (HS-5)
- Health Physics Policy and Programs (HS-12)

Any of these groups may respond to an emergency, if requested by the ERC, and are coordinated by the ERC (through their team leader, if applicable) in the ICG.

2.2.1 Health Physics Operations (HS-1)

Radiological incidents that occur at any of the TAs are evaluated by HS-1, Health Physics Operations. HS-1 will provide field personnel to perform radiological monitoring and decontamination under the supervision of Certified Health Physicists.

2.2.2 Occupational Medicine (HS-2)

LANL maintains its own medical facility operated by HS-2, Occupational Medicine. This group provides appropriate medical treatment for occupationally-related illnesses and injuries and monitors employees to assess the effectiveness of health protection programs. In addition to promoting early identification and prevention of illnesses or injuries that may arise from low-level exposures to hazardous or radioactive materials, HS-2 maintains documented records of the health status of employees and related occupational medicine activities.

Although HS-2 is not involved with on-scene emergency response, they maintain a central medical facility with a fully-equipped emergency room and decontamination facilities at TA-3, SM-409. Additionally, this group staffs three satellite first-aid stations at TA-53, TA-16 (S-Site), and TA-55. The locations of these emergency facilities are shown on Figure 4. Medical staff includes physicians, physician's assistants, registered nurses, x-ray technicians, a physical therapist, a clinical psychologist, assistance counselors, and clinical laboratory technicians. All full-time physicians and nurses have received radiation accident training.

HS-2 is supported by the Industrial Safety and Hygiene Group's (HS-5) capabilities for exposure and treatment information via telephone access to the National Library of Medicine's TOXLINE and CHEMLINE; the Toxicity Databank files; POISONDEX and TOMESPLUS (Micromedics); and the CC/INFO database files on MSDSs, NIOSH Technical Information Center information, and the Registry of Toxic Effects of Chemical Substances. HS-1 and HS-12 provide radiation exposure and monitoring support. HS-2 maintains the TOMES system at the central medical facility (SM-409) to assist the clinical staff with timely exposure and treatment information.

2.2.3 Risk Management Support (HS-3)

HS-3, Risk Management Support, is responsible for coordinating and publishing policy and guidance on safety training and operational safety for LANL. Additionally, HS-3 provides guidance and assistance to LANL divisions for safety analysis documents and to LANL groups for facilities analysis.

2.2.4 Industrial Safety and Hygiene (HS-5)

Personnel from HS-5, Industrial Safety and Hygiene, comprise the LANL HAZMAT Team. The HAZMAT Team is responsible for the aggressive mitigation of chemical and mixed waste emergencies, including field decontamination of victims and responders. LANL standards require that the HAZMAT Team meet the training criteria for emergency response personnel

specified in 29 CFR 1910.120(q)(6)(iii), (iv), and (v). The HAZMAT Team is part of the ICG reporting through the ERC. HS-5 also provides site field testing to determine the nature and extent of chemical contamination, provides information on correct handling of chemicals, makes recommendations on protective clothing and equipment, and provides exposure and treatment information.

2.2.5 Health Physics Policy and Programs (HS-12)

The Radiological Emergency Assistance (REA) Section of the Health Physics Policy and Programs Group (HS-12) provides a wide range of health and safety support for radiological incidents at LANL. The REA Team coordinates with the ERC to provide radiological assessment and mitigation. This section also provides a contamination-control station at the scene of a radiological incident to process people working in a radiologically-contaminated area, and is capable of performing decontamination of personnel.

2.3 ENVIRONMENTAL MANAGEMENT (EM) DIVISION RESPONSE GROUPS

At the scene, the Environmental Management groups are coordinated in the ICG by the ERC.

2.3.1 Waste Management (EM-7)

The Waste Management Group (EM-7) is responsible for initial response actions at RCRA TSDFs, including mixed waste treatment and storage units. This group also provides guidance on proper treatment, storage, and off-site shipment of mixed waste.

2.3.2 Environmental Protection (EM-8)

The Environmental Protection Group (EM-8) is responsible for regulatory compliance and provides guidance on regulatory requirements to other groups. After an emergency, EM-8 provides field surveys of soil, water, air, and biota to determine environmental effects of exposure. The group provides expertise in hydrogeology and meteorology to establish near- and long-term environmental effects of emergency conditions.

2.4 OTHER LANL RESPONSE RESOURCES

2.4.1 Nuclear Materials Technology (NMT)

Several personnel from the Nuclear Materials Technology (NMT) Division have been trained in emergency response procedures. In the case of an emergency interrupting operations at TA-

55, these personnel are responsible for monitoring for leaks, pressure buildup, gas generation, or equipment ruptures.

2.5 CONTRACTED RESPONSE GROUPS

Contracted response groups report to the Operations Officer in the ICG or directly to the Incident Commander in the event of a smaller emergency.

2.5.1 Protection Technology Los Alamos (PTLA, Pro Force)

The Pro Force is responsible for LANL security, which is provided by Protection Technology Los Alamos (PTLA) under contract to LANL. During an emergency, the Pro Force activities include maintenance of security, direction of traffic within LANL, and control of access to the emergency scene. The Pro Force maintains the necessary equipment to perform these functions, such as crowd control equipment and patrol cars.

2.5.2 Johnson Controls World Services Inc. (JCI)

Johnson Controls World Services Inc. (JCI) provides a maintenance support force under contract to LANL. This support force is under LANL's direction in an emergency. JCI conducts inspections of LANL equipment, maintains equipment, and participates in post-emergency cleanup under the direction of HS-5.

2.6 OUTSIDE RESPONSE AGENCIES

Outside response agencies report to the Operations Officer in the ICG. In smaller emergencies, they may report directly to the Incident Commander.

2.6.1 Los Alamos Fire Department

The Los Alamos Fire Department (LAFD) provides fire protection and ambulance coverage for the communities of Los Alamos and White Rock and for LANL. In the case of an emergency within LANL, the Fire Department coordinates fire suppression efforts. LANL requires that Fire Department personnel meet the training criteria for emergency response personnel specified in 29 CFR 1910.120(q)(6)(i) and (ii). A copy of the proposed Statement of Work for the contract between LANL and the LAFD is included as Appendix A.

2.6.2 Los Alamos Police Department

In keeping with the principle of handling emergencies internally, the Los Alamos Police Department (LAPD) has only minimal interaction with LANL in an emergency. That interaction is limited to traffic control on DOE roads with public access and to criminal investigations. The

limits of interaction are included in a signed agreement. A copy of this agreement is included as Appendix B.

2.6.3 Los Alamos Medical Center

Those medical cases which cannot be handled at HS-2 will be transferred to the Los Alamos Medical Center (LAMC), where LANL maintains a fully-equipped decontamination room adjacent to the emergency room. In the event that a case is sent to the hospital, support for the emergency room staff is provided by HS-2 medical personnel, HS-1 Health Physics Operations staff, HS-5 Industrial Safety and Hygiene staff, and HS-12 Health Physics Policy and Programs personnel. This assistance is coordinated through LANL's EMO.

3.0 EMERGENCY EQUIPMENT AND COMMUNICATIONS

40 CFR Part 264 Subpart D requires a listing of all emergency response equipment available that can be used in the event of an emergency. Emergency equipment available at each mixed waste unit and in the HAZMAT vehicles and trailers is provided in Appendix C. Appendix C also includes supplemental emergency equipment maintained by JCI, the Los Alamos Fire Department, and HS-2. The locations of emergency facilities are shown on Figure 4.

Effective emergency response at LANL requires an efficient communication system which will integrate all personnel into the emergency response. The initial phase of an emergency will involve a small number of individuals at the affected area and notification of the designated Emergency Manager. When responding to mixed waste emergencies, the EMO provides communications between response units and emergency organizations.

There are two central alarm systems at LANL; the emergency central alarm system, and the maintenance central alarm system. The emergency central alarm system may be activated to notify the Emergency Manager of a mixed waste emergency; the maintenance central alarm system is activated when an equipment malfunction may result in an emergency. These two systems are described below.

3.1 EMERGENCY CENTRAL ALARM SYSTEM

The emergency Central Alarm Station (CAS) is located at TA-64-1. This station is manned by Pro Force personnel 24 hours a day and is equipped with telephones, medium- and short-range radios, direct-line telephones, a National Warning System (NAWAS) station, and an emergency power system. The fire alarm board at the control room gives the location of automatic and pull fire alarms.

The emergency central alarm system is activated by:

- Telephone communication (9-911 or 911)
- Automatic fire alarms
- Manual pull alarms
- Computer interface (to warn of critical events at selected facilities)
- Break-in security
- Radio communications

Activation of the emergency central alarm system automatically alerts the CAS dispatcher, the Pro Force, and the Los Alamos Fire Department. For mixed waste emergencies, the CAS

dispatcher notifies the designated Emergency Manager. The required emergency response groups are then notified of the problem by the Emergency Manager, ERC, and/or the CAS dispatcher.

3.2 MAINTENANCE CENTRAL ALARM SYSTEM

The maintenance central alarm system is manned by JCI personnel 24 hours a day. The maintenance alarm system interfaces with computers which monitor sensitive equipment throughout LANL. Activation of an alarm triggers a call-out procedure to alert maintenance personnel and management supervision to correct the malfunction.

Internal communication systems at LANL include:

- Centrex telephone system
- Medium-range radio nets (30-60 miles)
- Limited-range radio nets (3-10 miles)
- Telephone/radio paging
- Two-way hand-held radios

Off-site communications with Federal, state, county, and other agencies are maintained by the following:

- Centrex telephone system
- Private telephone lines (if Centrex fails)
- Medium-range radio nets (30-60 miles)
- Limited-range radio nets (3-10 miles)
- Two NAWAS
- KRSN radio link (local radio station)

The LANL EOC, located at TA-59-1 and maintained by the EMO, operates radio systems on key LANL and off-site channels. Emergency personnel responding to on-site incidents have the benefit of wide-area radio coverage using the EOC facilities. After hours, the Emergency Manager is responsible for activating whatever support personnel, services, or equipment is needed.

4.0 CONTINGENCY PLAN IMPLEMENTATION

The following section defines the guidelines used to initiate this Contingency Plan and the resulting actions taken.

4.1 GUIDELINES FOR IMPLEMENTATION

The decision to implement this Contingency Plan depends upon whether or not an imminent or actual incident involving a release of mixed waste or mixed materials to the environment could threaten human health or the environment. The following guidelines shall be used by the Emergency Manager in making the decision whether or not to implement this plan.

This Contingency Plan will be implemented in the following situations involving mixed waste:

Spills

- A mixed waste or mixed material spill cannot be contained with secondary containment or application of absorbents
- Precipitation threatens to move spilled material off site
- A mixed waste or mixed material spill causes the release of flammable material, creating a fire or explosion hazard
- A mixed waste or mixed material spill results in toxic fumes which threaten human health
- An earthquake or other natural disaster threatens containment integrity

Explosions

- An unplanned explosion involving mixed waste or mixed material occurs
- An imminent danger exists that an explosion involving mixed waste or mixed material could occur

Fires

- Any fire involving mixed waste or mixed material
- Any building, grass, forest, or nonhazardous waste fire that threatens to volatilize or ignite mixed waste or mixed material

4.2 EMERGENCY NOTIFICATION

During working hours, immediately upon discovery of an imminent or actual incident involving mixed waste or mixed material, line management and the Emergency Management Office will

be notified by on-site personnel. During nonworking hours, all incidents involving mixed waste or mixed material shall be reported to the designated Emergency Manager or the CAS dispatcher. In the case of fire involving mixed waste or mixed material, notification of these individuals is superseded by the LANL fire alarm system. A fire is reported by dialing 9-911, activation of automatic alarms, or activation of a fire pull box. All fire alarms alert the CAS Dispatcher, the Los Alamos Fire Department, and the PTLA Pro Force. For fire involving mixed waste, mixed material, or a mixed waste unit, the CAS Dispatcher shall contact the Emergency Manager. Orange "1" signs on buildings which contain HE are a warning to firefighters not to approach or enter the building without obtaining information from WX or M Division personnel about the nature and location of HE materials in the building.

Upon recognition of a mixed waste emergency, the first arriving emergency trained person becomes the temporary Incident Commander. Once the Emergency Management Office is notified of the emergency, the designated Emergency Manager shall proceed to the scene and be briefed by the temporary Incident Commander, building/area personnel, and other emergency units/teams. The Emergency Manager may then assume the position of Incident Commander. The Incident Commander may recommend activation of the EOC to the ADO. Upon concurrence of the ADO, the EOC will be activated and the necessary members of the Emergency Management Team are determined. The Incident Commander shall form an ICG and contact the ERC. The ERC will notify the appropriate emergency response groups. Table 2 describes the assistance available from each response group. The Incident Commander may use this list as criteria to determine which groups to contact in an emergency. Each response group maintains an on-call person and/or a call-down procedure to respond to emergencies.

Because the initial observer may not be able to recognize the involvement of mixed waste or mixed material, the Emergency Management Office shall be notified of any mixed waste emergency. The IC and the ERC shall use whatever means are available, including the assistance of other response groups, computer data searches, and sampling to determine if a mixed waste is generated and/or released. HS-5, HS-12, EM-7, and EM-8 have the expertise to determine the nature and extent of contamination and the characteristics of the mixed waste involved.

4.3 EMERGENCY MANAGER ACTIONS

Upon notification of an incident, the Emergency Manager (Incident Commander) shall:

1. Proceed directly to the scene.

2. Call the ERC.

3. Assess the nature of the incident (e.g., through communication with the temporary Incident Commander).

4. Assume Incident Command.

5. In conjunction with the ERC, determine the quantities and types of mixed waste or mixed material involved.

6. Based on the guidelines in Section 4.1 of this plan, determine if implementation of this Contingency Plan is warranted.

7. Recommend activation of the EOC, if necessary.

Upon deciding to implement this Contingency Plan, the Incident Commander will perform the following additional response actions using the ERC, when appropriate:

1. Assess the hazards to human health and the environment including both direct and indirect effects, such as generation of toxic, irritating, or asphyxiating gases and/or hazards of runoff of water or chemicals used for fire suppression. An individual designated by the Emergency Manager will use the guidelines in Section 4.1 to assess the hazards to human health and the environment. If any of the criteria under Section 4.1 are met, evacuation of the immediate area will be initiated if the responsible group leader has not already accomplished evacuation of the area.

2. Determine if evacuation of the local area is advisable and, if so, immediately notify appropriate response groups and the LAPD.

3. Notify required response personnel and the DOE Los Alamos Area Office (LAAO) by phone, radio, or through the CAS Dispatcher. In the case of fire, the Emergency Manager shall confirm that the Fire Department Officer-in-Charge at the scene is aware of the special hazards associated with mixed waste, and will assume Incident Command.

4. Warn the remaining on-scene and response personnel of imminent or actual hazards using the radio or the public address (PA) system.

5. In emergency situations, the activated EOC Crisis Manager (Laboratory Director or designee), through the Environmental Management representative, will notify the New Mexico Environment Department (NMED) at (505) 827-9329, and the National Response Center at (800) 424-8802, reporting:

   - Name and telephone number of the reporter
   - Name and address of the facility
   - Time and type of incident
   - Name and quantity of material involved, to the extent known
   - The extent of injuries, if any
   - The possible hazards to human health or the environment outside the facility

6. Advise the response groups of hazards to minimize personnel exposure and expedite mitigation.

7. For mixed waste treatment units where the emergency interrupts operations, EM-7 personnel, or in the case of TA-55, the Nuclear Materials Technology (NMT) emergency response personnel must monitor for leaks, pressure buildup, gas generation, or equipment ruptures. Monitoring during shutdown is discussed in Section 10.1.

Once control of the emergency is established, the Incident Commander will delegate cleanup and decontamination responsibilities to the affected area's line management. The responsible group leader or group leader designee shall:

1. Arrange for site cleanup.
2. Provide for proper handling of recovered waste, contaminated soil, or contaminated surface/ground water.
3. Provide for decontamination of equipment as needed.
4. Arrange for replacement and/or repair of equipment, as needed.
5. Ensure that testing is conducted to verify successful cleanup.

Within 15 days of the incident, DOE LAAO will submit the report described in Section 13.0 to the Environmental Protection Agency (EPA) Regional Administrator and the NMED.

5.0 SPILLS

Sudden releases include spills of mixed waste or mixed material which pose a significant threat to human health or the environment. Spill incidents resulting in a sudden release of mixed waste to the environment which cannot be contained or which presents a threat to human health or the environment require implementation of this Contingency Plan.

Mixed waste is stored on site in a variety of containers, including but not limited to 55-gallon drums, lab packs, tanks, and small laboratory bottles. Volumes of mixed waste stored vary from unit to unit. The general steps in handling mixed waste spills are:

- Containment, including spreading absorbents or forming temporary dikes
- Waste pickup and packaging in sound containers
- Decontamination followed by testing to assure adequate cleanup

The steps to be taken for spill mitigation will be determined by the Incident Commander with input from the ERC. If initial mitigation of the spill is necessary before the Emergency Manager arrives, a qualified member of the affected area's operating group will serve as the temporary Incident Commander.

The emergency preparedness procedures related to flammable organic solvent spills call for stabilization of the spilled material with the organic solvent spill kit. Other chemical spills are to be stabilized using the acid and caustic spill kits or by the addition of universal sorbents. Personal protective equipment will be worn during spill control and cleanup. Health physics monitoring will be conducted to ensure that radiation exposure is minimized. The stabilized material will be treated as mixed waste. Runoff which might occur from spills of listed mixed waste that have migrated outside mixed waste storage areas must be contained and handled as a mixed waste. If the spill was from a characteristic mixed waste, and analysis shows that the runoff is not mixed waste, the runoff need not be managed as mixed waste. Temporary dikes may be constructed to contain runoff.

5.1 SPILL CONTROL PROCEDURES

When a flammable organic solvent, highly acidic, or highly caustic spill has been stabilized with the contents of an organic solvent, acid, or caustic spill kit, respectively, the resulting material may be absorbed by using corn cob fractions or universal sorbent. Universal sorbent can be used to control mixed waste spills. Department of Transportation (DOT)-approved drums or

approved packaging will be used to collect all spilled material and contaminated absorbent. For corrosives, the drums will be lined with polyethylene drum liners. The list of emergency equipment (Appendix C) shows the equipment available for spill control at each area where mixed waste is treated and/or stored. The ultimate disposition of any contaminated absorbent or waste material will be determined by EM-7 according to RCRA regulatory requirements.

5.2 DECONTAMINATION VERIFICATION

Decontamination will be accomplished at the spill site. After the spilled material has been absorbed, the material will be containerized. If the spill occurs on a cemented area, water or an appropriate solvent will be used to clean the area and this liquid will be absorbed with universal sorbent and containerized.

A sample of unused decontamination water or solvent and absorbent material will be taken prior to the final washing to establish baseline data. A composite sample will then be taken of the material used to absorb the final waste water. No hazardous waste constituents should be present in this sample that were not present at similar levels in the unused decontamination water. If the sample exhibits any of the characteristics of a hazardous waste as defined in 40 CFR Part 261 Subpart C, or a hazardous constituent as listed in 40 CFR Part 261 Appendix VIII (and not detected in the unused decontamination water) is present above established health-based levels, the decontamination procedure will be repeated. An alternative demonstration of decontamination may be proposed and justified to the Secretary, NMED, who will evaluate the proposed alternative in accordance with the standards and guidance then in effect. If the proposed alternative is accepted, decontamination levels will meet the levels approved by the NMED. Each composite sample will be taken using a thief or trier as specified in EPA's SW-846, "Test Methods for Evaluating Solid Waste," Physical/Chemical Methods, latest edition.

If the spill occurs on soil, any free liquid present will be absorbed with a compatible absorbent and the resulting material will be containerized. For such a spill, all contaminated soil will be excavated and containerized. Health physics monitoring will be conducted to minimize exposure during removal operations. The spill site will then be characterized to ensure that all contaminated material has been removed.

If a spill occurs in a sealed storage area, verification sampling will be performed after decontamination. Swipe samples or other types of sampling appropriate for the contaminant will be collected at random in the storage area and analyzed. For a spill that occurs in a storage area that does not have sealed floors, random samples of the floor material, such as concrete

chips, will be collected and analyzed for decontamination verification. Removal of floor material contaminated with mixed waste will occur if the level of contamination remains unacceptable after repeated decontamination attempts.

If a spill is from a known source, the spilled material will be analyzed for hazardous waste constituents known to be components of the mixed waste managed at that unit. Analytical procedures specified in Table 4 will be used. If the spill is from an unknown source, the chemical composition will be determined by using the parameters and test methods specified in Table 4.

6.0 EXPLOSION

A sudden release caused by an explosion may result in a significant threat to human health or the environment. The potential exists for mixed material to be released during an explosion. If a mixed material is released to the environment, this substance may become a regulated mixed waste. Implementation of this Contingency Plan is required whenever a sudden release which cannot be contained or which presents a threat to human health or the environment occurs as a result of an explosion.

In the case of explosions, all personnel will immediately evacuate the area. Any injured personnel will be decontaminated in the field, if required and if time allows, and transported by LAFD ambulance to an HS-2 facility or LAMC for treatment. If an injury is severe and requires immediate medical evacuation, the injured person will be wrapped to contain contamination. The Emergency Management Office must be contacted immediately upon activation of the emergency central alarm system, and then the Emergency Manager will ensure that all necessary emergency response personnel are alerted. The LAFD is notified automatically upon central alarm system activation. The Emergency Manager assumes Incident Control and will remain near the site, but at a safe distance, to inform the personnel responding to the explosion of the known hazards.

Upon arrival at the scene, the LAFD Senior Officer will evaluate information provided by the group leader, other site personnel, other members of the ICG, and Incident Commander to select the appropriate fire-fighting methods and tactics. The LAFD Senior Officer will direct fire-fighting operations under the general direction of the Incident Commander.

7.0 FIRE

Fires may result in a sudden release of mixed waste or mixed material which poses a significant threat to human health or the environment. Mixed raw material may be considered a regulated waste if it becomes a product of combustion. Implementation of this Contingency Plan is required whenever a fire incident results in a sudden release of mixed waste which cannot be contained or which presents a threat to human health or the environment.

Depending on the size of the fire and the fuel source, portable fire extinguishers may be used. However, LANL policy discourages the use of portable fire extinguishers by employees and encourages immediate evacuation of the area and notification of the Los Alamos Fire Department. For any fire involving mixed waste, the responsible group leader and the Emergency Management Office must be contacted immediately. The Emergency Manager will alert all necessary emergency response personnel. The Fire Department is automatically alerted when the emergency central alarm system is activated. If the fire spreads or increases in intensity, all personnel should evacuate to an area designated by the responsible group leader or Emergency Manager. The Emergency Manager assumes Incident Command and should remain near the scene to advise the personnel responding to the fire of the known hazards. The Emergency Manager is familiar with spill response and emergency actions and, therefore, is qualified to advise fire-fighting personnel of the potential hazards involved.

Upon arrival at the scene, the LAFD Senior Officer will evaluate information provided by the group leader, other site personnel, other members of the ICG, and Incident Commander to select the appropriate fire-fighting methods and tactics. The LAFD Senior Officer will direct fire-fighting operations under the general direction of the Incident Commander.

8.0 UNPLANNED NONSUDDEN RELEASES

Nonsudden releases include those incidents which, if uncontrolled, impact the environment over a long period of time. Such incidents include minor leaks from containers, loss of integrity of secondary containment, and incomplete treatment.

8.1 RESPONSIBILITY

Correction of a nonsudden release from a mixed waste unit shall be the responsibility of the operating group and can be handled with normal maintenance and management procedures. Correction methods for nonsudden releases that have resulted in an impact to the environment shall be coordinated with the NMED.

8.2 NONSUDDEN RELEASES

Not all failures can be predicted. In general, the response to a nonsudden release will (1) contain the release, (2) correct the cause of the release, and (3) clean up any release to a level that protects human health and the environment.

8.3 NONSUDDEN RELEASE SURVEILLANCE

In addition to routine inspection and site-specific sampling and testing, LANL has established an area-wide environmental monitoring network maintained by EM-8. Monitoring and sampling locations for various types of measurements are organized into three main groups. Regional monitoring stations are located within the five counties surrounding Los Alamos County. They are placed up to 80 kilometers (50 miles) from LANL, and serve to determine background conditions. Perimeter stations are located within approximately four kilometers (2.5 miles) of the LANL boundary and document conditions in residential areas surrounding LANL. On-site stations are within the LANL boundary, and most are accessible only to employees during normal working hours.

The types of routine surveillance conducted at these stations include radiation measurements and collection of air particulates, surface waters and groundwaters, soil, sediment, and foodstuffs for subsequent analysis. Additional samples are collected to gain information about particular events, such as major runoff events and nonroutine releases. Data are used for comparison with standards, background radiation levels, and dose calculations.

9.0 EXPOSURE TO MIXED WASTE OR MIXED MATERIALS

If a person is exposed to mixed waste or mixed material, the affected person, a coworker, or line management will notify the EMO and/or the ERC. The ERC will notify HS-1 and/or HS-5 directly, as appropriate, as soon as possible so that exposure levels and decontamination requirements can be established. Chemical material in the eye or on the skin will be washed either with the entire contents of the portable eye wash station or for at least 15 minutes. The eyelids will be held open during washing, if possible. The injured person will then be quickly transported to the HS-2 Medical Facility for evaluation. If possible, the material involved in the injury will be ascertained and the information given to the medical staff.

Other potential mixed material exposures will necessitate evacuation if anyone notices any of the following conditions:

- Irritation of the eyes, breathing passages, or skin
- Difficulty in breathing
- Nausea, light-headedness, vertigo, or blurred vision

The affected person will be transferred to the HS-2 Medical Facility and an HS-1, HS-5, or HS-12 representative will attempt to ascertain what, if any, mixed material or mixed waste exposure occurred and what corrective measure is appropriate.

10.0 EVACUATION

A facility will be evacuated upon the voice command to evacuate the area, or upon the sounding of the evacuation alarm or the fire alarm.

10.1 EMERGENCY PROCESS SHUTDOWN PRIOR TO EVACUATION

Personnel are instructed to shut down equipment prior to evacuating a building unless an immediate building evacuation is announced or signaled. To ensure efficient shutdown, training and exercises in process shutdown are performed. In the case of an immediate evacuation, a selected team may shut down designated equipment in an evacuated area. The team will be equipped with the proper equipment, clothing, and breathing apparatus. If present, HS-1, HS-3, and HS-5 will provide advice and assistance. Process shutdown procedures apply mainly to mixed waste treatment units, which include the controlled air incinerator at TA-50-37, the cementing process at TA-50-1, and the oxygen sparging furnace and cementing process at TA-55-4. Process shutdown procedures are described below.

10.1.1 TA-50-37 Controlled Air Incinerator

If a fire or evacuation alarm sounds at TA-50-37 during the operation of the controlled air incineration process, the operating crew will initiate a process shutdown in accordance with the current standard operating instructions. Three logic sequences are provided to shutdown the process in a safe and orderly manner.

- Controlled Shutdown - initiated when there is potential for significant damage to minor process components. This is also the normal shutdown mode at the completion of a run. When controlled shutdown is initiated, feeding of waste to the incinerator is stopped and a programmable set-point generator is activated that directs remote set-point inputs to the temperature controllers, causing a gradual decrease in chamber temperatures. Switches internal to the set-point generator cause an orderly-timed shut down of process components.

- Fast Shutdown - initiated for conditions that could likely result in loss of containment or damage to major process components. Waste feeding is stopped. Following a two-minute timed interval following the last feeding of solid waste (immediate, if feeding liquid waste), the upper and lower chamber burners are shut down and the system valves and dampers are positioned so as to maintain a negative pressure in the system while minimizing flow through the system. Snuffing steam is introduced into the lower chamber. The two-minute delay when feeding solid waste allows for the ignition of pyrolitic gases formed immediately after feeding.

- Scram Shutdown - initiated at the discretion of an operator. The chain of events are identical to the fast shutdown except that the sequence is not delayed when feeding solid waste. Scram buttons are located at the incinerator and in the control room.

- The last two shutdown modes are potentially destructive to the incinerator refractory and are initiated only when the consequences of not shutting down are greater than the consequences to the incinerator during a scram or fast shutdown. It is the responsibility of the process lead engineer and the operating personnel to assess any situation and initiate the proper process shutdown sequence.

Table 5 lists items that are to be monitored at the controlled air incinerator during an emergency shutdown.

10.1.2 TA-50-1 Cementing Process

The only item associated with the sludge stabilization process which will be monitored during an emergency shutdown is the Sludge Feed Pump Number 5 to Tank 8. Pump Number 5 must be turned off prior to evacuation of Room 60A if the sludge stabilization process is in operation.

10.1.3 TA-55-4 Oxygen Sparging Furnace

If a fire alarm sounds at TA-55-4 during the operation of the oxygen sparging furnace, the power to the furnace will be turned off. Additionally, the flow of oxygen will be stopped immediately.

10.1.4 TA-55-4 Cementing Process

In the event of a fire alarm or an emergency evacuation, the cementing process will be shut down if time and conditions allow. Shutdown is accomplished by depressing a shutdown button. This action puts the cementing process into a safe, stand-by status.

10.2 EVACUATION PLAN

Emergency situations may warrant the shutdown and evacuation of an area(s) or building(s) in order to protect personnel and property, to anticipate the emergency condition, or to enhance the appropriate response. Table 6 shows the criteria for evacuation, persons responsible for initiating evacuations, and reentry conditions. Evacuation routes, alternate evacuation routes, and muster areas for mixed waste units at LANL are shown in Figures 5 through 19.

To initiate building evacuation, the evacuation or fire alarm is sounded and/or the public address system is used. The evacuation alarm cannot be silenced and reset by site personnel. The Fire Alarm Maintenance Section at 667-4027 and the LAFD Platoon Chief at 667-7026 can silence and reset the alarm.

To evacuate a portion of a building, the PA system is more appropriate. The PA system will notify the occupants of the area to be evacuated and, additionally, will advise personnel in the rest of the facility of the existence of a problem in that specific area.

The PA system, fire alarm, or evacuation alarm may be used to initiate an evacuation. Once evacuation has been initiated, personnel are to turn off all equipment, if conditions allow, that could contribute to the hazard if left unattended. Personnel should then leave the affected area and go to the muster area.

In the event of an evacuation of only a portion of the building, one of the outbuildings, or outlying work areas, the responsible group leader will designate a control point at the closest safe location (e.g., considering wind direction). This area will be outside the affected area and will serve as a muster point where the group leader or his designee can oversee evacuation operations and work to prevent further spread of the hazard.

As personnel exit an affected building/area, a primary sweep will be performed to ensure that all personnel have evacuated. If the building/area is evacuated, a group leader designee will take the attendance roster to the muster area, call roll, and report personnel accountability to the Incident Commander. The evacuation procedure follows:

1. Person discovering the accident or emergency will call 911 or 9-911, and ensure that line management and the EMO are notified.

2. Building Emergency Plan will be followed concerning evacuation, sweep, personnel accountability, and equipment shutdown procedures.

For a small-scale evacuation, a responsible on-site person may direct evacuation. For a large-scale evacuation, the emergency central alarm system may be activated, the EMO will be notified and, until the Emergency Manager arrives at the scene to assume responsibility for the evacuation, a responsible on-site person may begin the evacuation process.

11.0 SALVAGE AND CLEANUP

The affected area will be surveyed by appropriate representatives from the HS and EM Groups before salvage, cleanup, and return to normal operations. Visual inspections of the affected area will be supplemented by sampling to determine whether cleanup is complete. After determination of any existing hazards from toxic or hazardous gases or fumes, electrical hazards, radiological hazards, or other unsafe conditions, personnel or selected teams, equipped with proper breathing apparatus and protective clothing, will reenter the area to perform designated decontamination tasks, repairs, and salvage to allow the return to normal operations. After an emergency, the Incident Commander will turn the operation over to line management, who will:

- Provide for proper handling of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion. Contaminated material will be treated as a mixed waste and temporarily stored at one of the interim status mixed waste storage areas or less-than-90-day storage areas at LANL. EM-7 will be responsible for determining the final disposition of the waste. This determination will be made in compliance with RCRA interim status standards.

- Arrange for site cleanup procedures to be completed and ensure that no waste that may be incompatible with the released material is treated or stored in the same area.

- Ensure that emergency equipment is cleaned, decontaminated, and fit for its intended use before operations are resumed. Equipment will be visually inspected and sampled to determine the type and degree of contamination and appropriate cleanup measures that will be used.

Prior to resuming operations, the owner/operator (DOE LAAO) will notify appropriate local authorities that cleanup procedures are completed and emergency equipment is cleaned and fit for its intended use.

Damage assessment, recovery, and reporting shall be performed within the requirements of DOE Order 5000.3A, as referenced by DOE Order 5500.3A (Emergency Planning and Preparedness for Operational Emergencies). The Incident Commander assumes the coordination of post-emergency actions, particularly during the time period immediately after the emergency. Such actions include cleanup operations, repair of vital equipment, or interim hazard-removing operations (such as demolition of unstable walls). The services of the affected operational organizations, HS and EM Divisions, JCI, and other on-site resources will also be utilized to estimate cleanup costs and operational impact.

12.0 POST-EMERGENCY ASSESSMENT

When the emergency is over, the cause of the emergency and the effectiveness of the response are investigated, in order that future emergencies may either be prevented, or that the response to them may be more effective. Following each event requiring the implementation of this Contingency Plan, the Emergency Manager will schedule and conduct a critique with representatives of all response groups, building/area representatives, and LANL management to determine the adequacy of the response.

13.0 EMERGENCY RESPONSE RECORDS AND REPORTS

The details of any incident that requires implementation of this Contingency Plan must be recorded by the responsible group or section leader for that mixed waste unit. This Incident Report must include the time, date, and full description of the incident.

Any emergency that requires implementation of this Contingency Plan will be reported in writing within 15 days to the NMED. The report, submitted by DOE LAAO, shall include the following data:

- Name, address, and phone number of owner or operator
- Name, address, and phone number of the facility
- Date, time, and type of incident (e.g. fire, explosion, spill)
- Name of material involved
- Quantity of material involved
- Extent of injuries (if any)
- Assessment of actual or potential hazards to human health or the environment
- Estimated quantity and disposition of material recovered from the incident

14.0 CONTINGENCY PLAN AMENDMENT

This Contingency Plan will be reviewed by the EMO, EM-7, and EM-8, and by HS-5 and HS-12, if necessary, and will be immediately amended if determined to be inadequate to handle spills, explosions, fires, and whenever:

- The facility permit is revised
- There is significant change in the design or operation of the facility (i.e., waste quantities handled and handling techniques)
- The list of Emergency Managers changes
- The list of emergency equipment significantly changes
- Operating experience, drills, or technical review demonstrates that the plan is inappropriate
- Actual implementation of the plan demonstrates inadequacies

This plan is a controlled document distributed by the EM-8 Group. Any amendments to this Contingency Plan will be distinguished by the Revision No. and date of revision noted in the upper right-hand corner of each page. Amendments shall be issued to all Contingency Plan holders and will include a cover letter that describes the plan changes and rationale for those changes.

15.0 EMERGENCY PROVISIONS SPECIFIC TO THE TA-53 SURFACE IMPOUNDMENTS

This section contains information on emergency equipment and communications, emergency response procedures, and emergency repairs (as specified in 40 CFR 264.227) specific to the three surface impoundments at TA-53. These units store liquid waste and sludge; the sludge at the bottoms of the impoundments may contain metals, organic compounds, and low-level radionuclides.

15.1 EMERGENCY COMMUNICATIONS AND EQUIPMENT

In the event of an emergency, Laboratory-wide communication equipment allows personnel to contact emergency coordinators in all areas of the Laboratory. In addition to the facility-wide communication and alarm system described in Section 3.0 of this contingency plan, communication radios are available in the trucks used by JCI personnel while at the impoundments. Telephones are also available at the JCI building near the impoundments and throughout TA-53 for internal and external communication.

In the event of an emergency at the TA-53 surface impoundments, a HAZMAT emergency response vehicles and trailer stationed at TA-59-1 may be transported to the site. The vehicles and trailer are equipped with safety and emergency equipment, personal protective clothing, and other supplies which include, but are not limited to: assorted coveralls and gloves, safety goggles and glasses, booties, totally encapsulating suits and boots, self-contained breathing apparatus (SCBA), and SCBA bottles, reference materials, shovels, assorted spill kits and sorbents, communication radios, leak repair kits, respirators and cartridges, sponges and cleaners, warning signs, traffic control barriers, flashlights, warning horns, portable emergency oxygen, and assorted tools and supplies.

15.2 EMERGENCY RESPONSE PROCEDURES AND EMERGENCY REPAIRS

If the structural integrity of the surface impoundment(s) is breached, a sudden drop in the level of liquid may result. Should failure of the dike(s) occur, the surface impoundment(s) will be removed from service and the flow of influent will be stopped immediately. Influent to the northwest impoundment may be halted by turning off the water source at the TA-53 water tank. There are two connections between the two north surface impoundments. One consists of a weir box and a moveable plate, which may be inserted manually. The second consists of a pond equalizer with a manually operated gate valve. The weir plate and the gate valve may be manually moved or closed to segregate the two north impoundments in the event of an emergency. Influent of liquid waste to the south impoundment is not a continuously-flowing system. Therefore, in the event of an emergency involving the south impoundment, influent to the impoundment will cease and liquid waste may be stored in tanks until the emergency situation has been mitigated.

In addition to halting the flow of influent to the impoundment(s), temporary dikes will be constructed to contain leakage. All necessary steps will be taken to stop leaks and prevent catastrophic failure of the surface impoundment dikes. If contingency measures fail, the impoundment(s) will be emptied and removed from service until the problem has been repaired. The director of NMED will be notified of the problem in writing within seven days after detection. The structural integrity of the dike will be recertified in accordance with 40 CFR Part 264.226(c) whenever imminent or actual dike failure occurs. If repairs in the impoundment liner are required, the repaired liner will be certified by a qualified engineer and meet approved design specifications.

16.0 REFERENCES

Benchmark Environmental Corporation, 1990, "TA-54 Muster Stations," prepared for Los Alamos National Laboratory, November 1990.

Los Alamos National Laboratory, Emergency Management Office, "Emergency Response Plan," Los Alamos, New Mexico, September 1991.

New Mexico Environmental Improvement Board, March 1991, "New Mexico Hazardous Waste Management Regulations" (HWMR-6).

U.S. Department of Energy, 1990, "Emergency Planning and Preparedness for Operational Emergencies." DOE Order 5500.3A, Washington, D.C.

U.S. Department of Energy, 1990, "Spill Prevention, Control, and Countermeasure Plan for the Los Alamos National Laboratory," Rev. 2.

U.S. Department of Energy, 1988, "Radioactive Waste Management." DOE Order 5820.2A, Washington, D.C.

U.S. EPA, 1990, "Hazardous Waste Operations and Emergency Response," U.S. Environmental Protection Agency, 29 CFR Part 1910.120.

U.S. EPA, 1990, "Interim Status Standards For Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," U.S. Environmental Protection Agency, 40 CFR Part 265.

U.S. EPA, 1986, "Test Methods for Evaluating Solid Waste," Laboratory Manual Physical/Chemical Methods, Volumes 1A-1C, EPA-SW-846, U.S. Government Printing Office.

TABLES

TABLE 1

MIXED WASTE STORAGE AND TREATMENT UNITS AT LOS ALAMOS NATIONAL LABORATORY

TA AND BUILDING OR AREA DESCRIPTION	CAPACITY	WASTE MANAGED	ACTIVITY DESCRIPTION
TA-3-29, Wing 9 Basement, (2 areas)	2,000 gallons	Lead shielding waste	Storage
	16,500 gallons	Cemented process waste from plutonium recovery operations; waste may contain Toxicity Characteristic (TC) metals, listed solvents	Storage
TA-15-184, PHERMEX Facility	100 pounds of material per detonation	HE mixed waste; ignitable, reactive, TC metals may be present	HE mixed waste treatment by detonation
TA-16-88	275 gallons	Classified mixed waste	Storage
TA-21-61	5,500 gallons	Low-level mixed waste; RCRA characteristic and listed waste may be present	Storage
TA-36-8, MINIE Firing Site	500 pounds of material per detonation	HE mixed waste; ignitable, reactive, TC metals may be present	HE waste treatment by detonation
TA-50-1-60A Liquid Waste Treatment Facility	660 gallons/day	Pretreatment sludge from plutonium recovery/processing operations; TC metals and F-listed solvents may be present	Treatment by stabilization of waste using cement
TA-50-1-60D Liquid Waste Treatment Facility	825 gallons	Cemented pretreatment sludge from plutonium recovery processing operations	Storage
TA-50-37 Controlled Air Incinerator	1.5×10^6 BTUs/hour	Combustible liquids and solids, both TRU and low-level; F-listed solvents and TC metals may be present	Waste incineration with flue gas treatment
TA-50-37, Rooms 115, 117, and 118	Room 115 - 220 gallons Room 117 - 3,630 gallons Room 118 - 18,000 gallons	Liquid and solid combustible waste; ignitable waste, F-listed solvents and TC metals may be present	Storage/staging areas for incinerator

TABLE 1
(Continued)

TA AND BUILDING OR AREA DESCRIPTION	CAPACITY	WASTE MANAGED	ACTIVITY DESCRIPTION
TA-50-37, Room 115 Liquid waste feed tanks	310 gallons	Liquid combustible waste; F-listed solvents and TC metals may be present	Liquid waste blending and storage prior to incineration
TA-50-69	30,000 gallons - outside 1,500 gallons - inside	Oversized solid mixed waste, primarily lead/lead-containing solids such as gloveboxes, shielding and equipment	Storage prior to processing at Size Reduction Facility
TA-50-114 Modular storage shed	990 gallons	Solidified process waste; waste may contain TC metals and F-listed solvents	Storage
TA-53-166 3 Surface impoundments	2,580,000 gallons (S) 1,629,144 gallons (NW) 1,629,144 gallons (NE)	Waste in surface impoundments; waste may contain listed solvents and TC metals	Storage
TA-54 Area L	153,700 gallons (total of mixed waste subunits)	Low-level liquid mixed waste and gas cylinders; RCRA characteristic, F- P-, and U-listed mixed waste may be present	Storage
TA-54 Area G	7,133,775 gallons (total of mixed waste subunits)	Primarily solid TRU and low-level mixed waste	Storage
TA-55-4			
Container storage area	50 gallons	Evaporator salt precipitate	Storage
Container storage-vault	1,100 gallons	Pyrophoric salts, analytical solutions	Storage
3 Container storage areas	27,500 gallons	TRU mixed waste	Storage
Container storage area	3,400 gallons	Low-level mixed waste	Storage
Container storage area	3,400 gallons	Oversized TRU mixed waste	Storage
Container storage pad near TA-55-4	135,000 gallons	Solid mixed waste; primarily gloveboxes	Storage

TABLE 1
(Continued)

TA AND BUILDING OR AREA DESCRIPTION	CAPACITY	WASTE MANAGED	ACTIVITY DESCRIPTION
TA-55-4 (Continued)			
13 tanks	410 gallons total	TRU evaporator bottoms solution	Storage prior to solidification
Cementing process	110 gallons/day	TRU evaporator bottoms solution, analytical solutions, organic liquid and solid particulates	Treatment by stabilization using cement
Oxygen sparging furnace	0.26 pounds/hour	TRU pyrophoric salt waste	Treatment of pyrophoric salt

TABLE 2
RESPONSE GROUPS AND AGENCIES AVAILABLE TO THE EMERGENCY MANAGEMENT OFFICE FOR GUIDANCE AND/OR EMERGENCY ASSISTANCE

LABORATORY CONTROLLED RESPONSE GROUP	TELEPHONE	RESPONSIBILITIES
HS-1, Health Physics Operations	667-5296	Radiological monitoring and decontamination.
HS-2, Occupational Medicine	667-7251	Emergency medical treatment.
HS-3, Risk Management Support	667-3363	Provides personnel to perform risk analyses. Provides guidance on operational safety.
HS-5, Industrial Hygiene and Safety	665-4427	Site evaluation - field testing to determine the nature and extent of contamination (nonradiological). Specify protective clothing and equipment. Provide HAZMAT Team.
HS-12, Health Physics Policy and Programs	667-5296	Provide support for radiological incidents, provide REA Team capable of performing radiological assessments and personnel decontamination. Maintain radiological emergency preparedness for the Laboratory.
EM-7, Waste Management	667-5839	Provide guidance on proper treatment, storage, and off-site shipment of mixed waste.
EM-8, Environmental Protection	667-5021	Field surveys to determine spread of contamination and adequacy of cleanup.
EM-9, Environmental Chemistry	667-3269	Chemical/radiological analytical services.
NMT, Nuclear Materials Technology	667-2556	Monitor for leaks, pressure buildup, gas generation, or equipment ruptures in the event of interruption of operations at TA-55 due to an emergency.

TABLE 2
(Continued)

RESPONSE GROUPS AND AGENCIES AVAILABLE TO THE EMERGENCY MANAGEMENT OFFICE FOR GUIDANCE AND/OR EMERGENCY ASSISTANCE

LABORATORY CONTROLLED RESPONSE GROUP	TELEPHONE	RESPONSIBILITIES
Protection Technology Los Alamos Protective Force (Pro Force)	667-4437	Traffic control, security.
Johnson Controls World Services Inc.	667-6191	Maintenance personnel and equipment, assist in waste cleanup under HS-5 guidance.

NON-LABORATORY CONTROLLED RESPONSE GROUP	TELEPHONE	RESPONSIBILITIES
Los Alamos Fire Department	9-911	Firefighting personnel and equipment.
Los Alamos Police Department	9-911	Traffic control on DOE roads with public access.
Los Alamos Medical Center*	662-4201 or 911	Medical services.

* Medical services related to hazardous and mixed wastes injuries provided under the direction of HS-2.

TABLE 3

EMERGENCY MANAGEMENT OFFICE
EMERGENCY MANAGERS*

Emergency Managers	Laboratory Telephone	Home Telephone	Home Address
James S. Griffiths	7-6211	662-9155	190 Manhattan Loop, Los Alamos, NM
Gary W. Bequette	7-6211	662-4554	2369-B 33rd St., Los Alamos, NM
Frank G. Pearce	7-6211	984-8901	110 Delgado St., Santa Fe, NM
Deanna M. Seitz	7-6211	662-7356	65 San Juan, Los Alamos, NM
James A. Walton	7-6211	455-3316	Route 11, Box 20, Space 19, Santa Fe, NM

* To ensure immediate response, the Emergency Manager may be reached at the Emergency Management Office, 667-6211 or, after hours, 667-7080.

TABLE 4

WASTE ANALYSIS PARAMETERS AND TEST METHODS*

PARAMETER	TEST METHOD	REFERENCE(1)
Ignitability	Pensky-Martens Closed-Cup Method	(L) SW1010 (L) ASTM D93-80
Reactivity	Test method to determine Hydrogen Cyanide released from waste Test method to determine Hydrogen Sulfide released from waste	(L,S) SW Section 7.3
Corrosivity	Electrometric (pH of aqueous solution)	(L) SW9040
Toxicity Characteristic	Toxicity Characteristic Leaching Procedure (TCLP) Extraction and Graphite Furnace AA Spectroscopy	(L,S) Method SW1311
Arsenic		(L) SW7060
Barium		(L) SW7081, SW7080
Cadmium		(L) SW7131, SW7130
Chromium		(L) SW7191, SW7190
Lead		(L) SW7421, SW7420
Selenium		(L) SW7740
Silver		(L) SW7761, SW7760
Mercury	TCLP Extraction and Manual Cold Vapor Technique	(L) SW7470
Volatile Organics	TCLP Extraction and Gas Chromatography/ Mass Spectrometry (GC/MS)	(L) SW8240
	GC/MS Capillary Column Technique	(L) SW8260
Semivolatile Organics	TCLP and GC/MS Packed Column Technique	(L) SW8250
	GC/MS Capillary Column Technique	(L) SW8270
Organochlorine Pesticides/ Chlorinated Herbicides	TCLP Extraction and Gas Chromatography (L) SW8150	(L) SW8080
Chemical Composition	95% organic composition by GC/FID	(L) SW8100

TABLE 4

WASTE ANALYSIS PARAMETERS AND TEST METHODS
(CONTINUED)

PARAMETER	TEST METHOD	REFERENCE
Trace Organic Analysis	Any of the following:	
	Volatile organic compounds-GC/MS	(L) SW8240
	Semivolatile organic compounds-GC/MS	
	-Packed column	(L) SW8250
	-Capillary column	(L) SW8270
Heat Value	Bomb calorimeter	(L) A006, ASTM D240
Organic Chloride	Halide titration of combustion residue	(L,S) A004, ASTM D2361
Ash Content	Residue after combustion in muffle furnace	(L) A001, ASTM D482 (S) A001, ASTM D3174
Cyanide, Free and Total	Distillation and colorimetric (UV)	(L) SW9012
Total Chromium	Colorimetric method for hexavalent chromium	(L) SW7196
Sulfide	Colorimetric titration	(L) SW9030
Total Metals(2)	Acid Digestion	(L,S) SW3020
	Inductively Couple Plasma-Atomic Emission Spectroscopy (ICP)	(L) SW6010
Arsenic		(L) SW6010
Barium		(L) SW6010
Beryllium		(L) SW6010
Cadmium		(L) SW6010
Chromium		(L) SW6010
Lead		(L) SW6010
Nickel		(L) SW6010
Selenium		(L) SW6010

TABLE 4

WASTE ANALYSIS PARAMETERS AND TEST METHODS
(CONTINUED)

PARAMETER	TEST METHOD	REFERENCE
Silver		(L) SW6010
Thallium		(L) SW6010
Zinc		(L) SW6010
Mercury	Manual Cold Vapor Technique (L) SW7470	(S) SW7471
Free Liquids	Paint Filter Liquids Test	(S) SW9095

(1) "A" refers to Sampling and Analysis Methods for Hazardous Waste Combustion, EPA-600/8-84-002, February 1984.
"ASTM" refers to American Society for Testing Material Standards.
"SW" refers to Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, EPA, November 1986.
"L" refers to liquid waste.
"S" refers to solid waste.
See 55 FR 11863.

(2) See also Atomic Absorption Methods listed under TCLP.

* At LANL, standard test methods for organics are used on mixed waste samples that do not exceed one millicurie per gram or one millicurie per liter. Standard test methods for inorganics are used on mixed waste samples that do not exceed 100 picocuries per gram or 100 nanocuries per liter. Gross alpha, beta and gamma screening is performed for mixed waste samples.

TABLE 5

ITEMS MONITORED AT THE CONTROLLED AIR INCINERATOR (TA-50-37) DURING AN EMERGENCY SHUTDOWN

ITEM	MONITORED FOR
Incinerator/Equipment	Functioning
Pumps, valves, pipes	Leaks
Tank by-pass	Leaks
Emergency waste feed cut-off system	Functioning
HEPA Filtration System	Functioning
Radiation	Levels

TABLE 6

EVACUATION DETERMINATION AND REENTRY*

Reason for Evacuation	Evacuation Determination Made By	Reentry Conditions
Fire	Fire or evacuation alarm, Group Leader, Alternate, Lead Engineer, Senior Staff Member present, or Emergency Manager	Following survey by the Chief Fire Officer, HS-1 and/or HS-5, and R&D Supervision
Explosion	Same as above	Same as above
Loss of Ventilation	Group Leader, Alternate, Senior Staff Member, Lead Engineer, or Senior Technician	Following survey by HS-1 and/or HS-5, and R&D Supervision
Loss of Electric Power	Same as above	Same as above
Extensive Contamination	Same as above or HS-1 Representative	Same as above
Airborne Contamination	Same as above or Radiation Monitor	Same as above
Escape or Release of Toxic or Hazardous Gas or Fumes	Group Leader, Alternate, Senior Staff Member, Lead Engineer, Senior Technician, or Emergency Manager	Same as above plus HS-5
Bomb Threat	HS-3 or Protective Force Representative, R&D Section Leader, Alternative, Senior Staff Member, Lead Engineer, or Emergency Manager	Following determination by HS or Protective Force Representative and R&D Supervision

*All reentries are authorized by the Incident Commander.

FIGURES

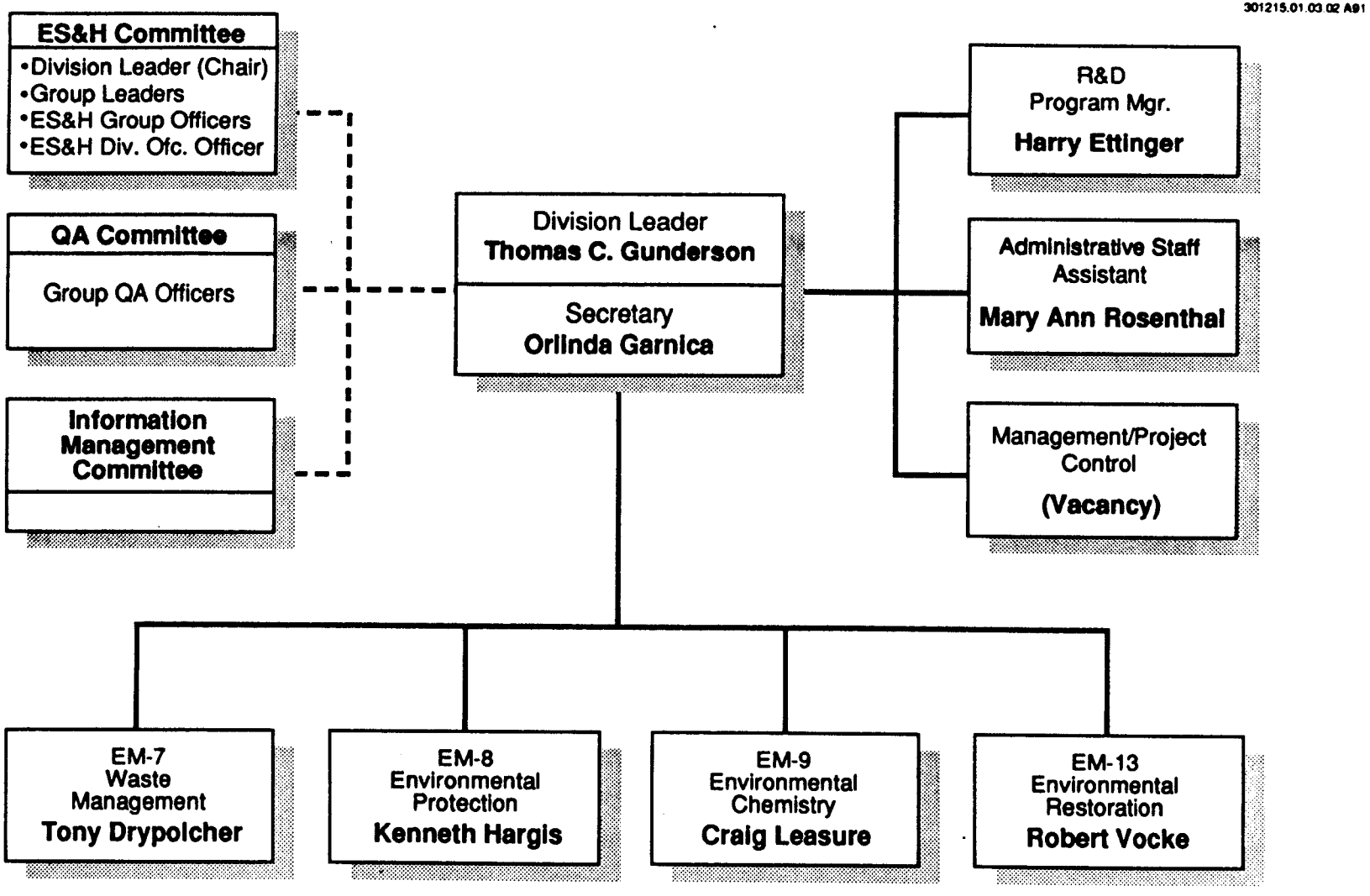


Figure 1. Los Alamos National Laboratory Environmental Management (EM) Division.

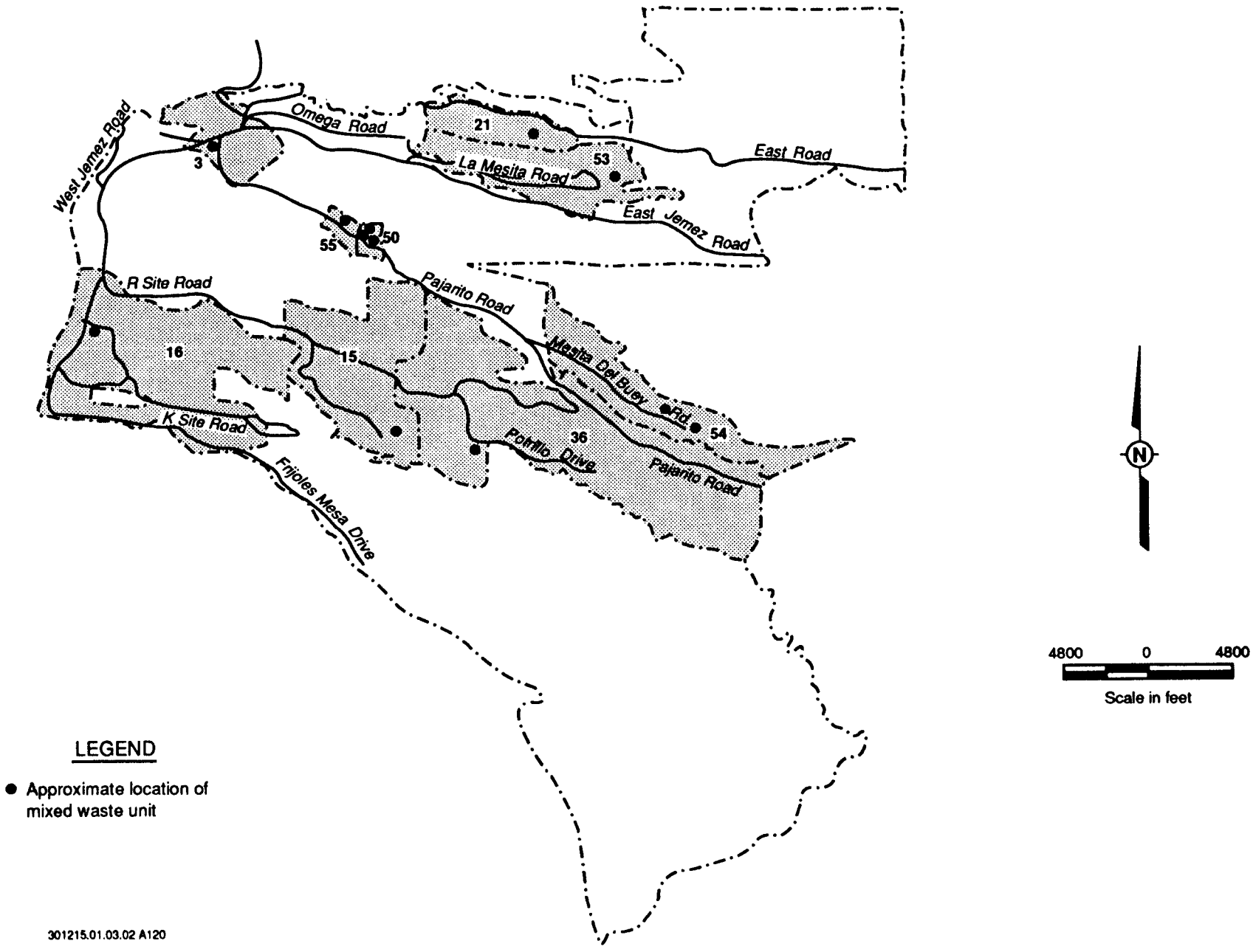


Figure 2. Technical areas with mixed waste storage and treatment units.

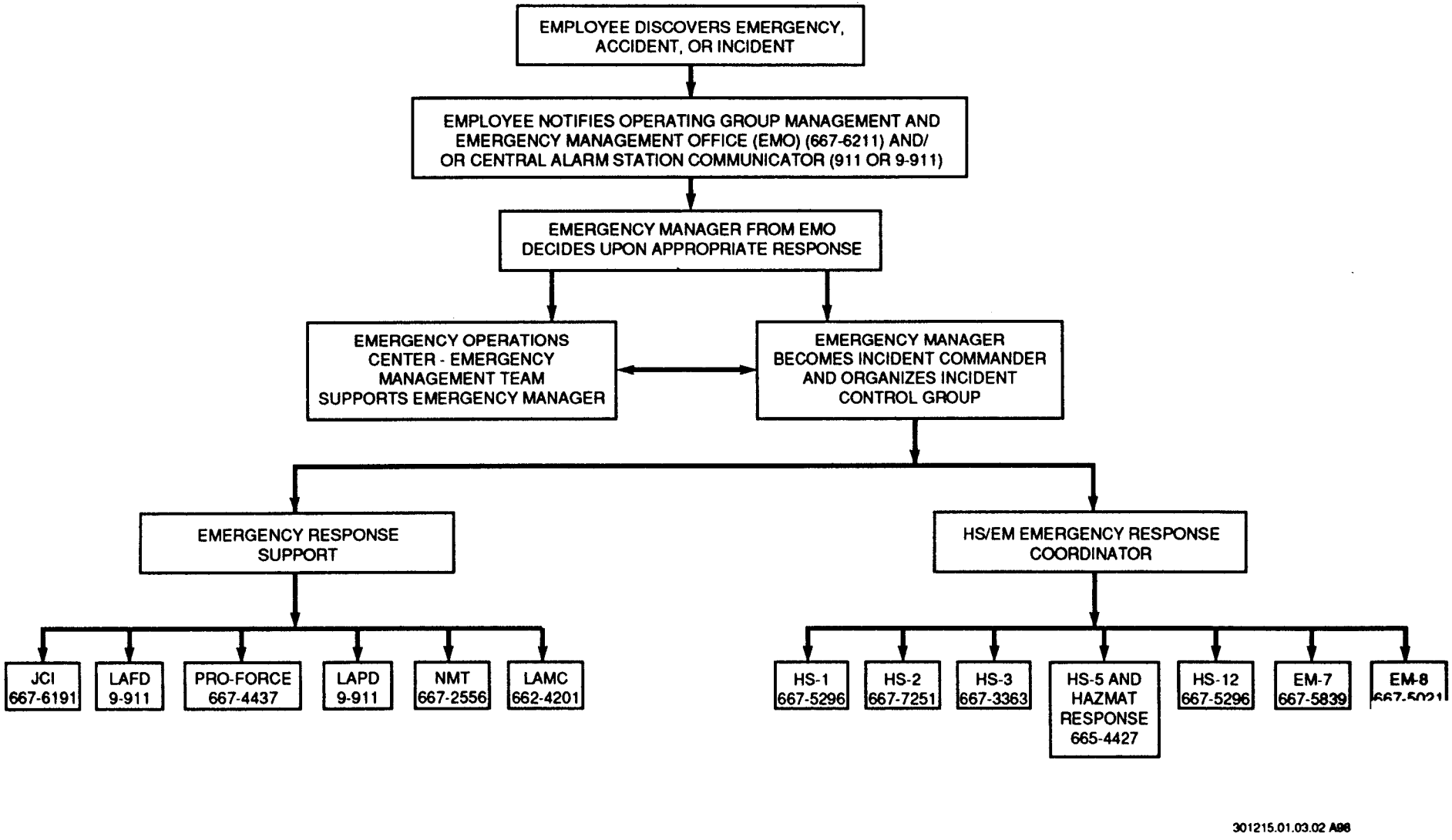


Figure 3. Mixed Waste Emergency Notification Structure.

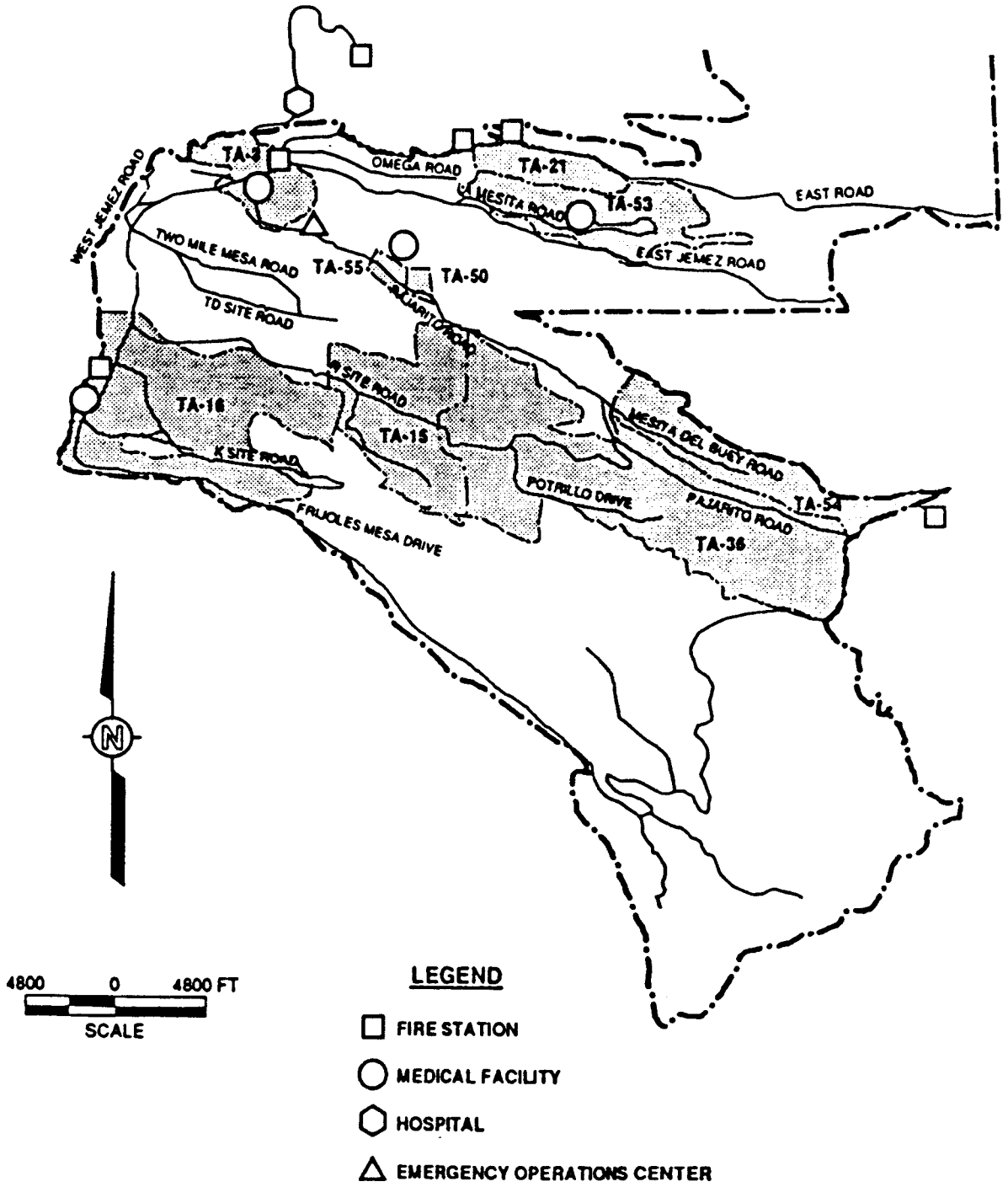


Figure 4. Emergency facilities.

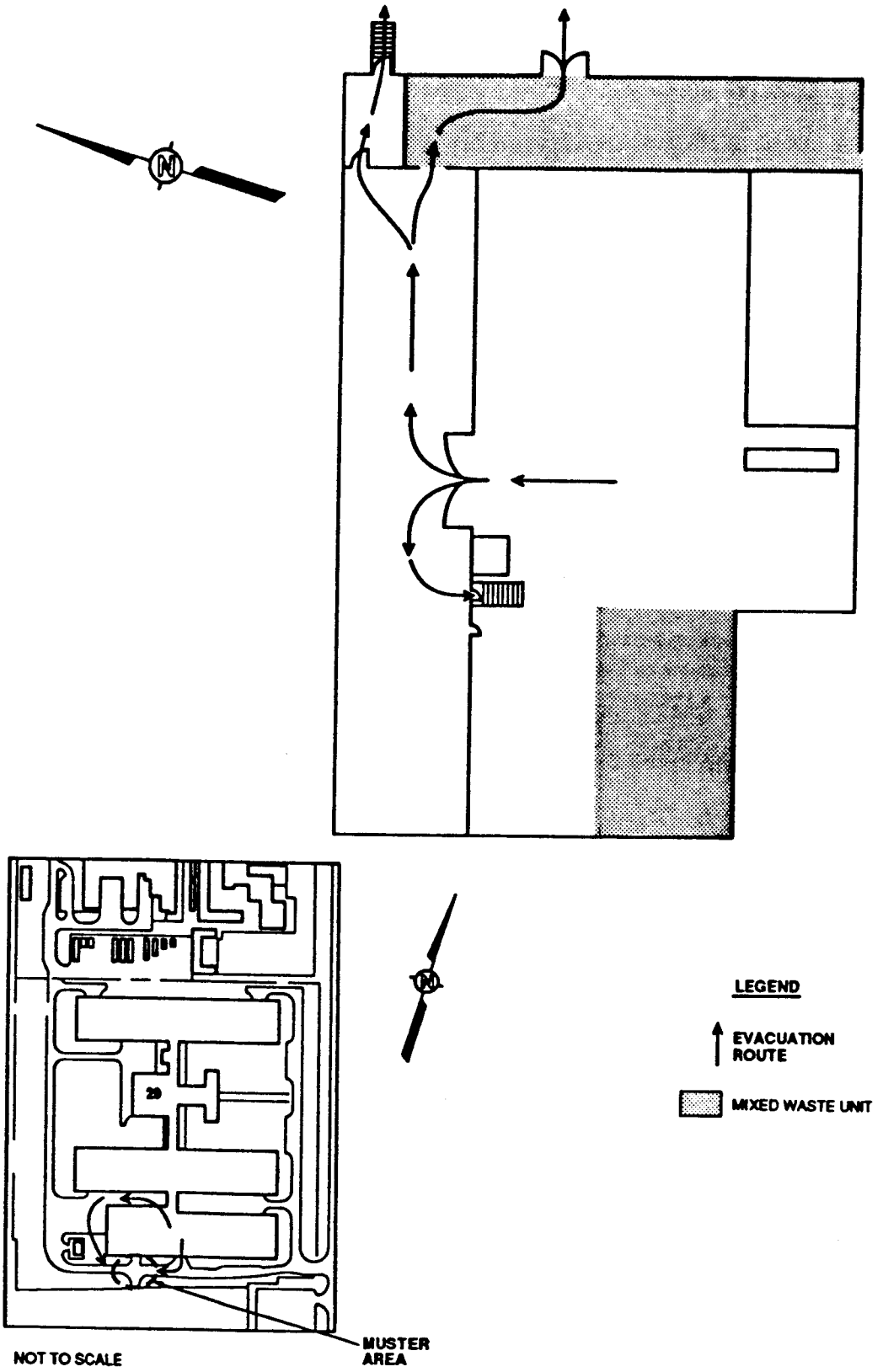


Figure 5. Evacuation routes and muster area at TA-3-29, Wing 9 basement.

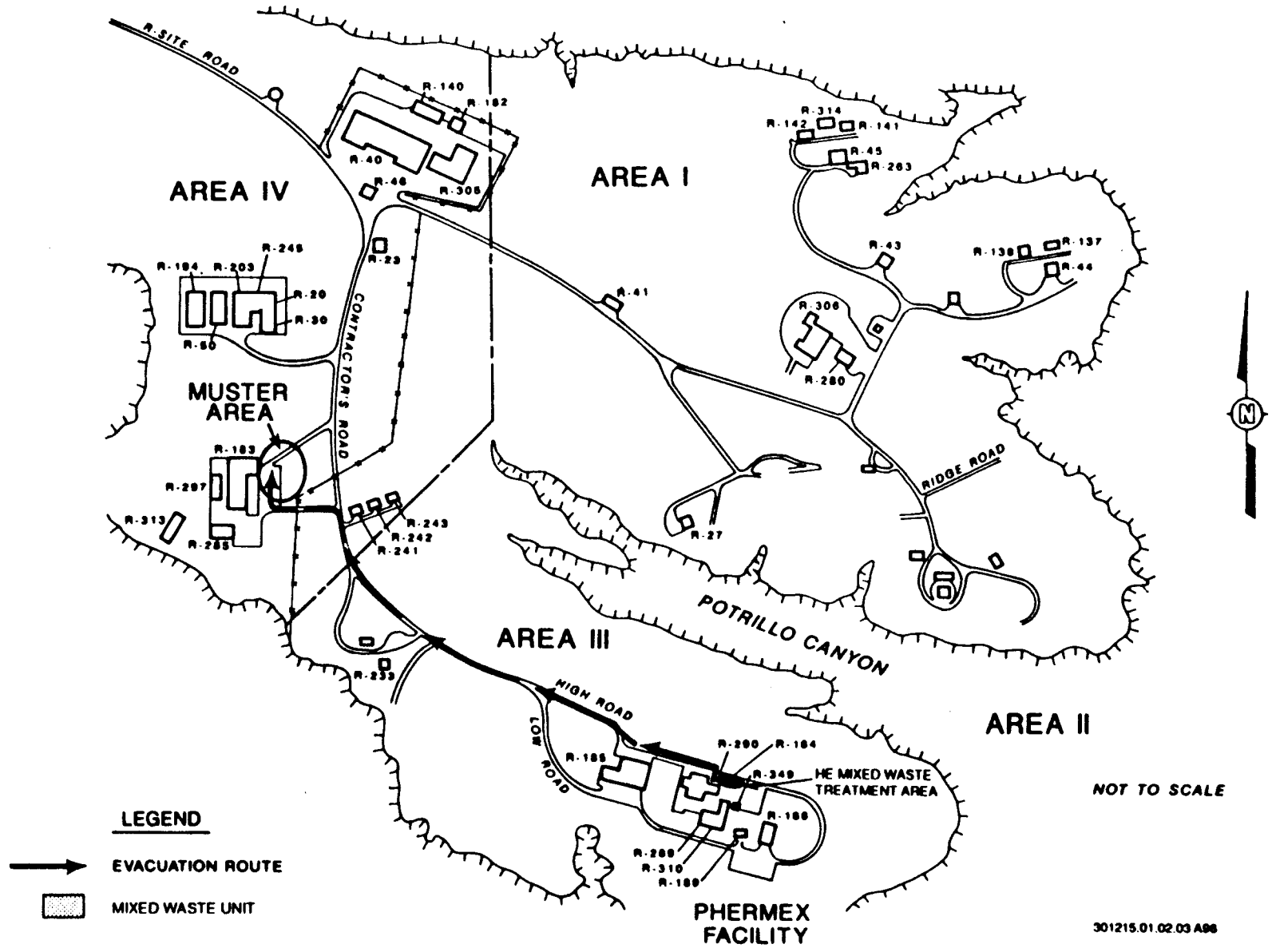


Figure 6. Evacuation route and muster area at TA-15-184.

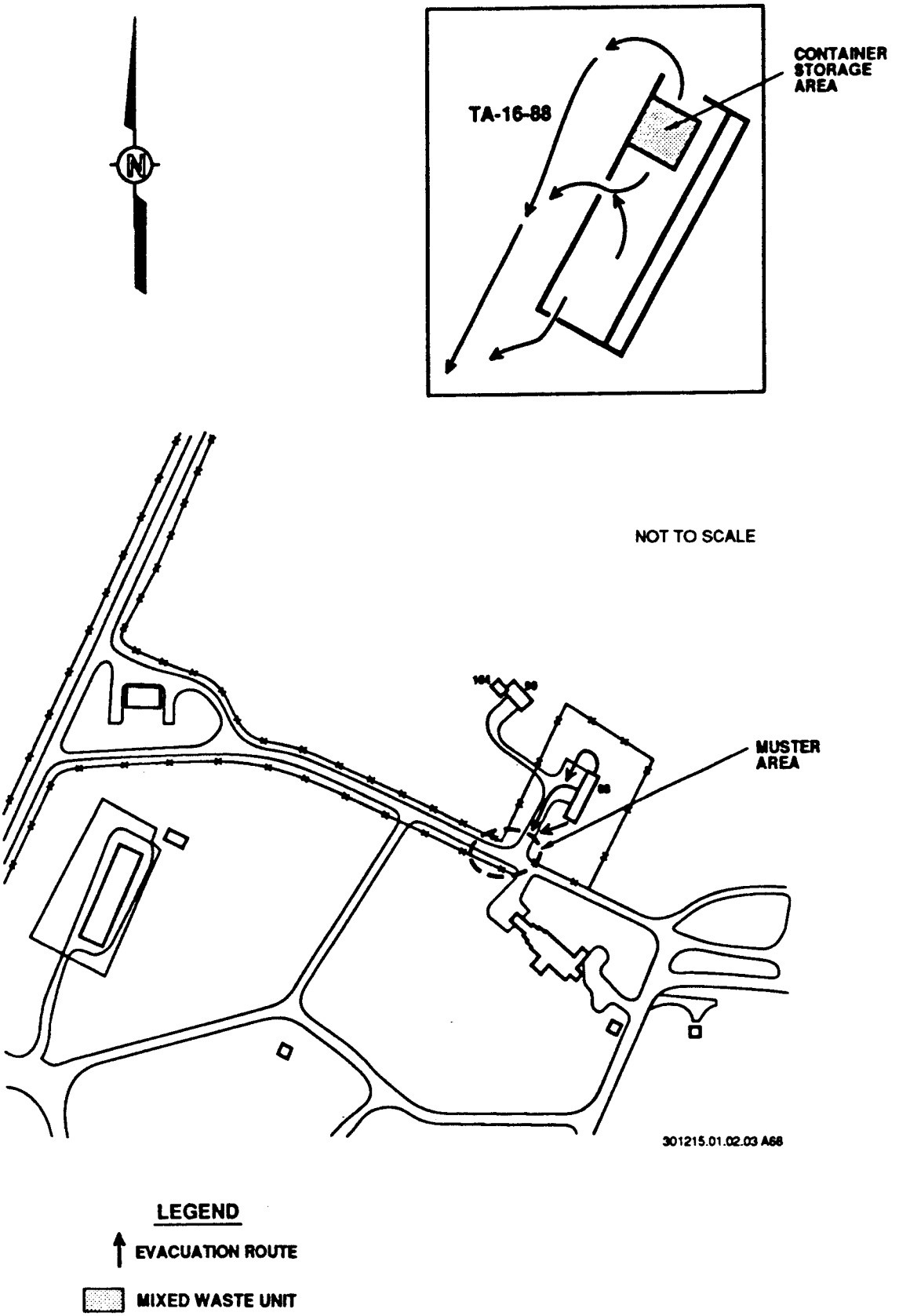
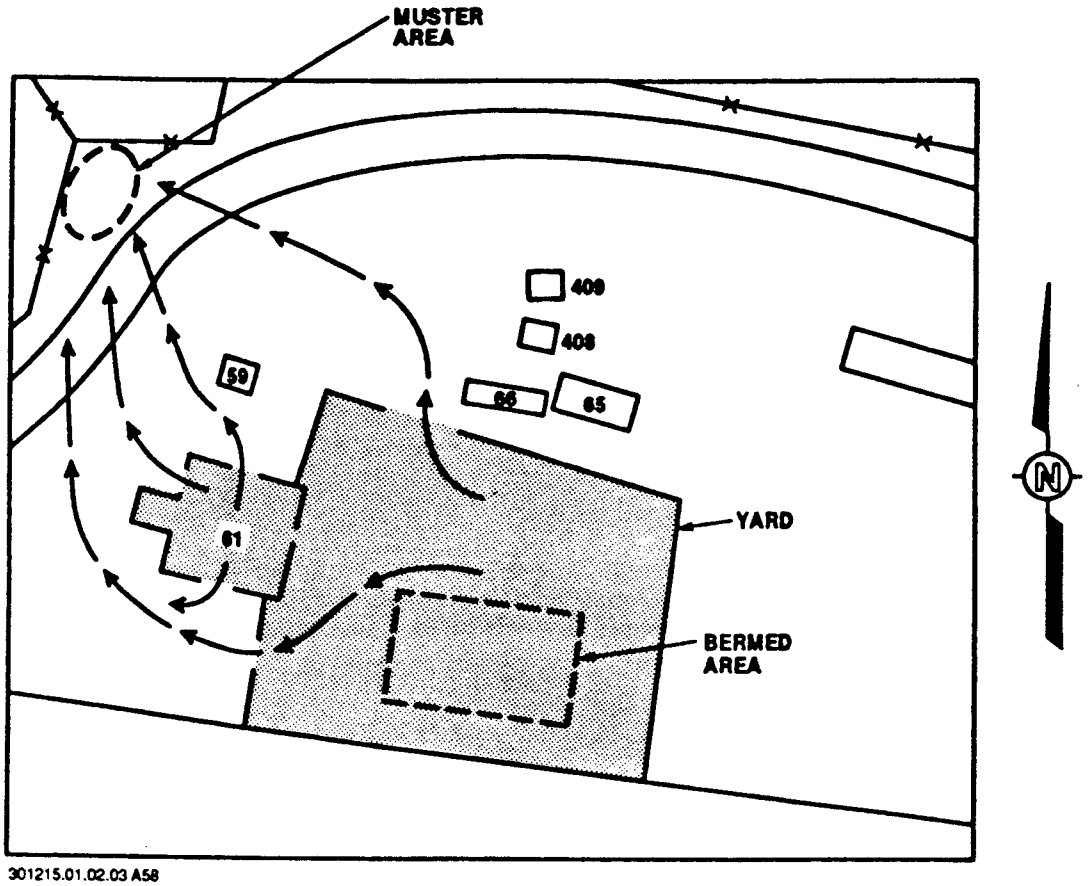


Figure 7. Evacuation routes and muster area at TA-16-88.



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NOT TO SCALE

LEGEND

EVACUATION ROUTE

SECURITY FENCE

MIXED WASTE UNIT

Figure 8. Evacuation routes and muster area at TA-21-61.

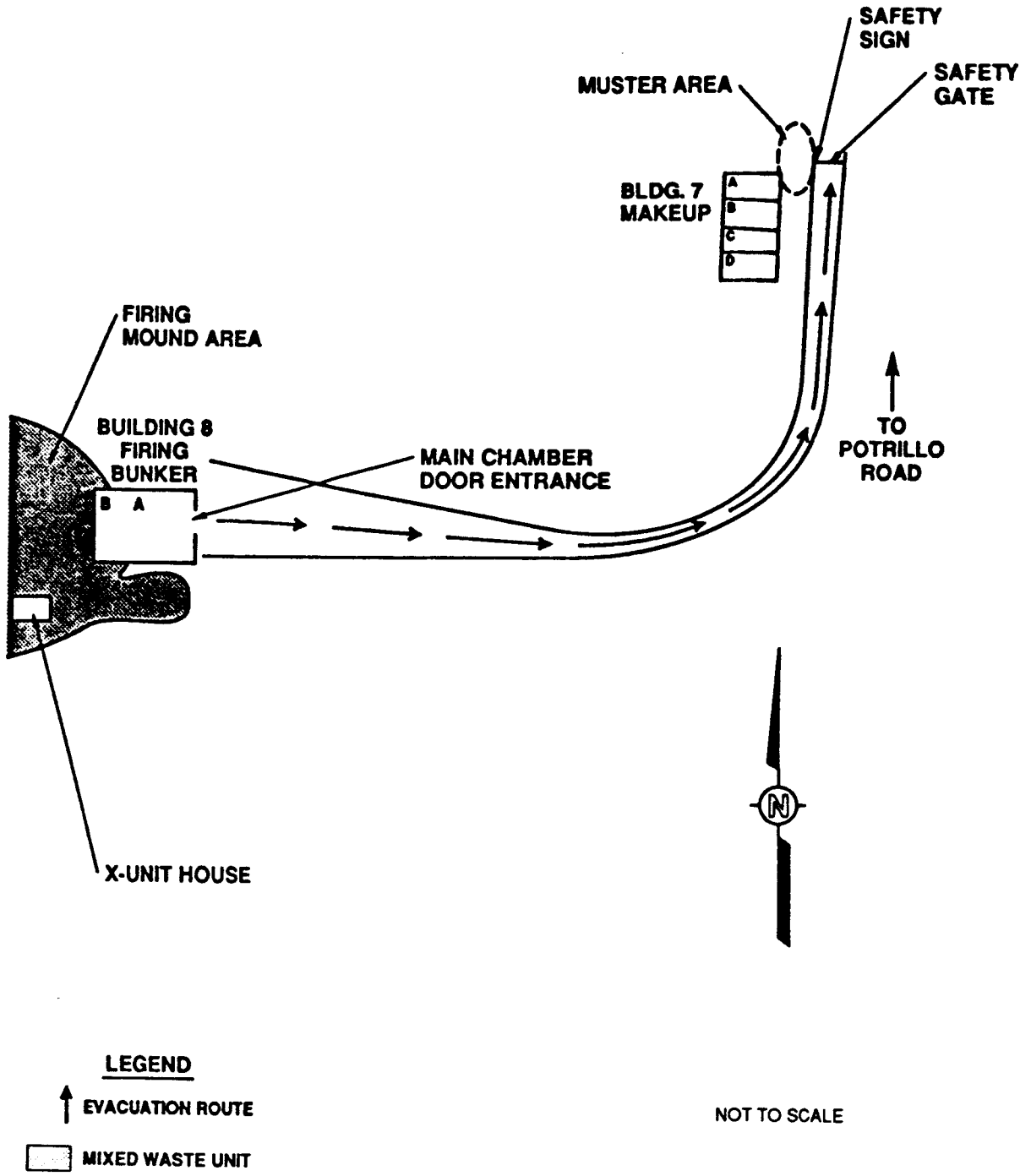
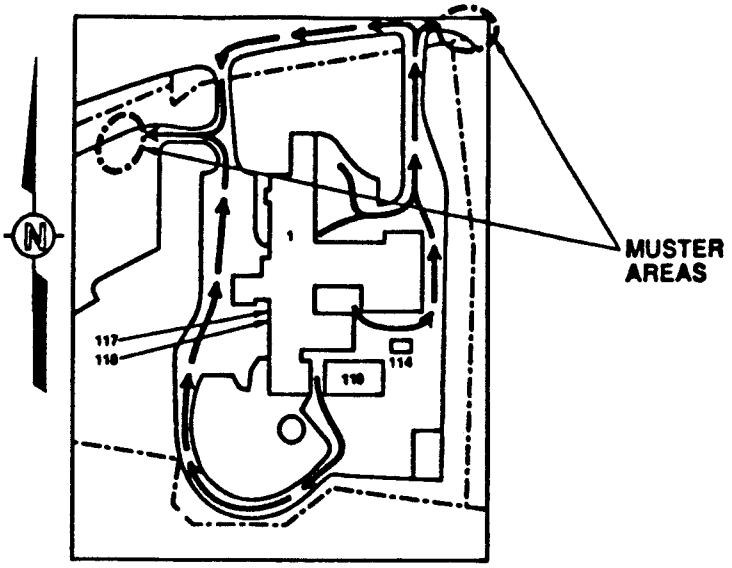
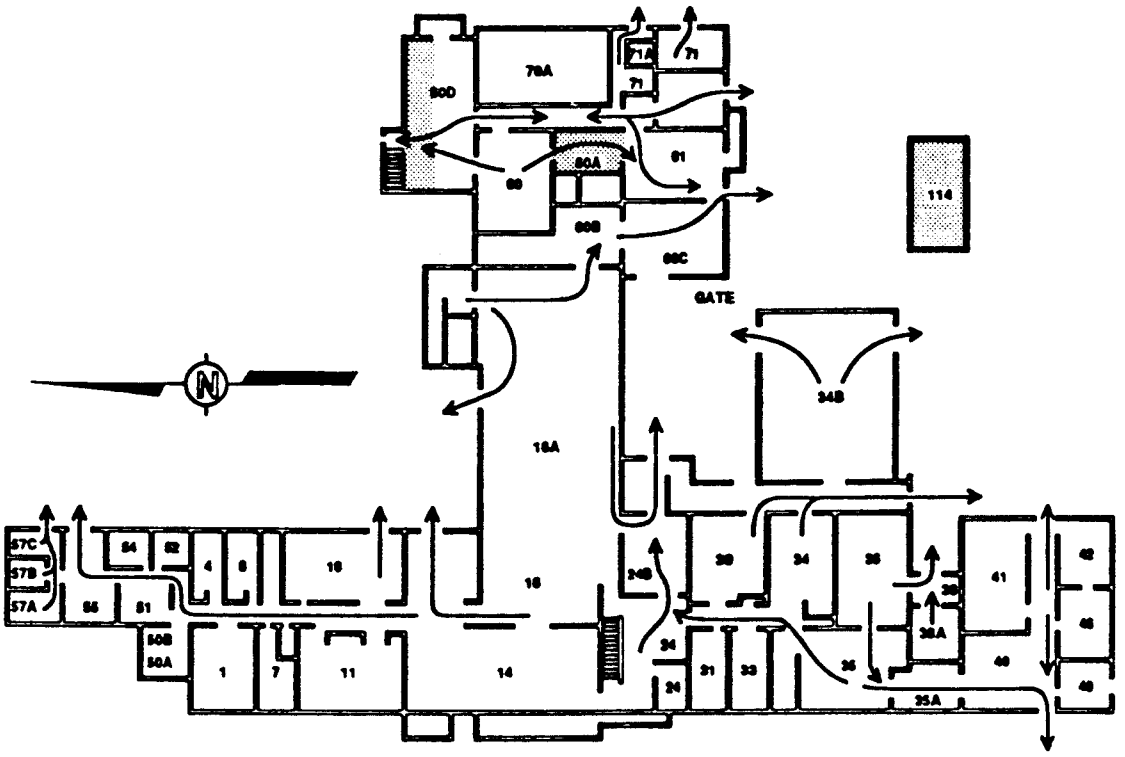


Figure 9. Evacuation route and muster area at TA-36-8.





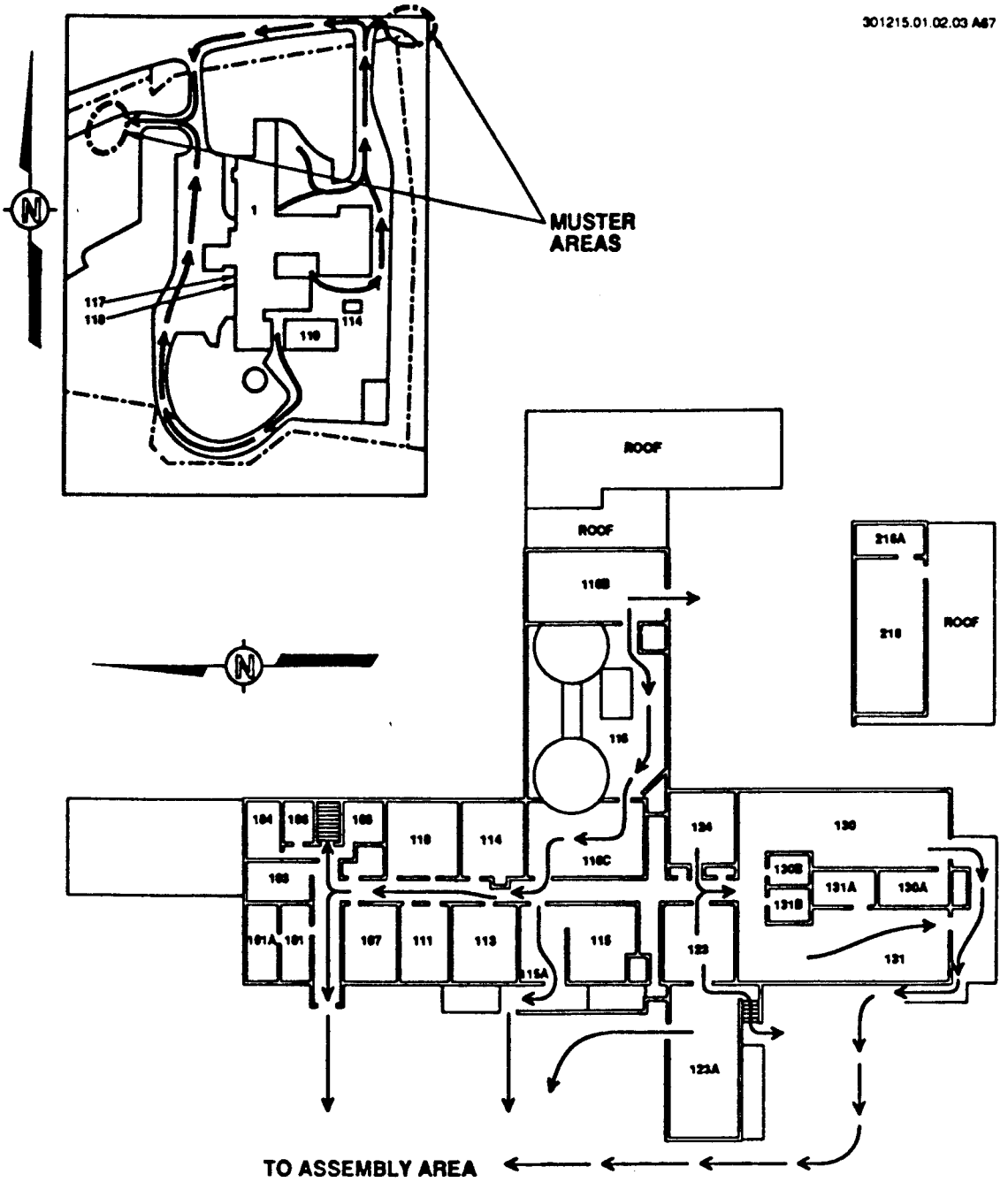
LEGEND

↑ EVACUATION ROUTE

MIXED WASTE UNIT

NOT TO SCALE

Figure 10. Evacuation routes and muster areas at TA-50-1 basement and TA-50-114.



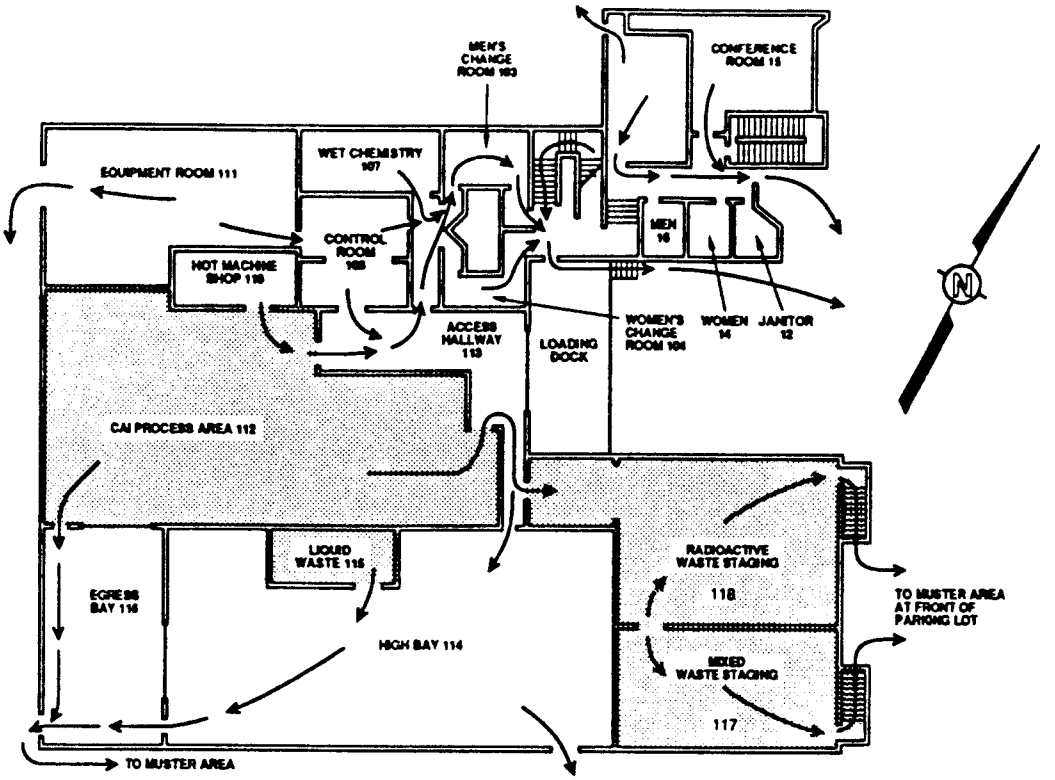
TA-50-1
FIRST FLOOR AND PENTHOUSE

LEGEND

↑ EVACUATION ROUTE

NOT TO SCALE

Figure 11. Evacuation routes and muster areas at TA-50-1, first floor and penthouse.



FIRST FLOOR

LEGEND

↑ EVACUATION ROUTE

● MUSTER AREAS

▭ MIXED WASTE UNIT

TA-50, BLDG 37
CONTROLLED AIR INCINERATOR
FACILITY EMERGENCY PLAN
EVACUATION MUSTER AREAS
AND HAZMAT INFORMATION BOXES

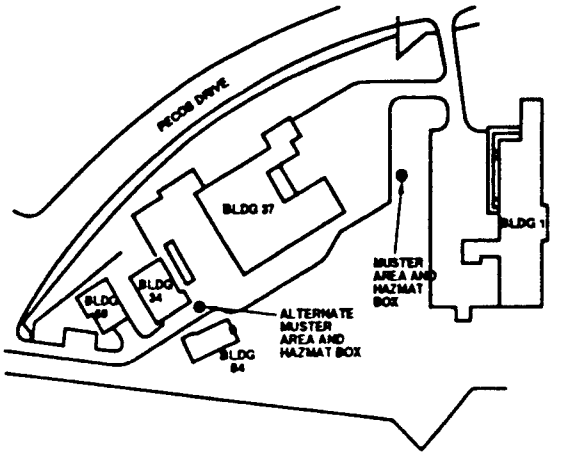


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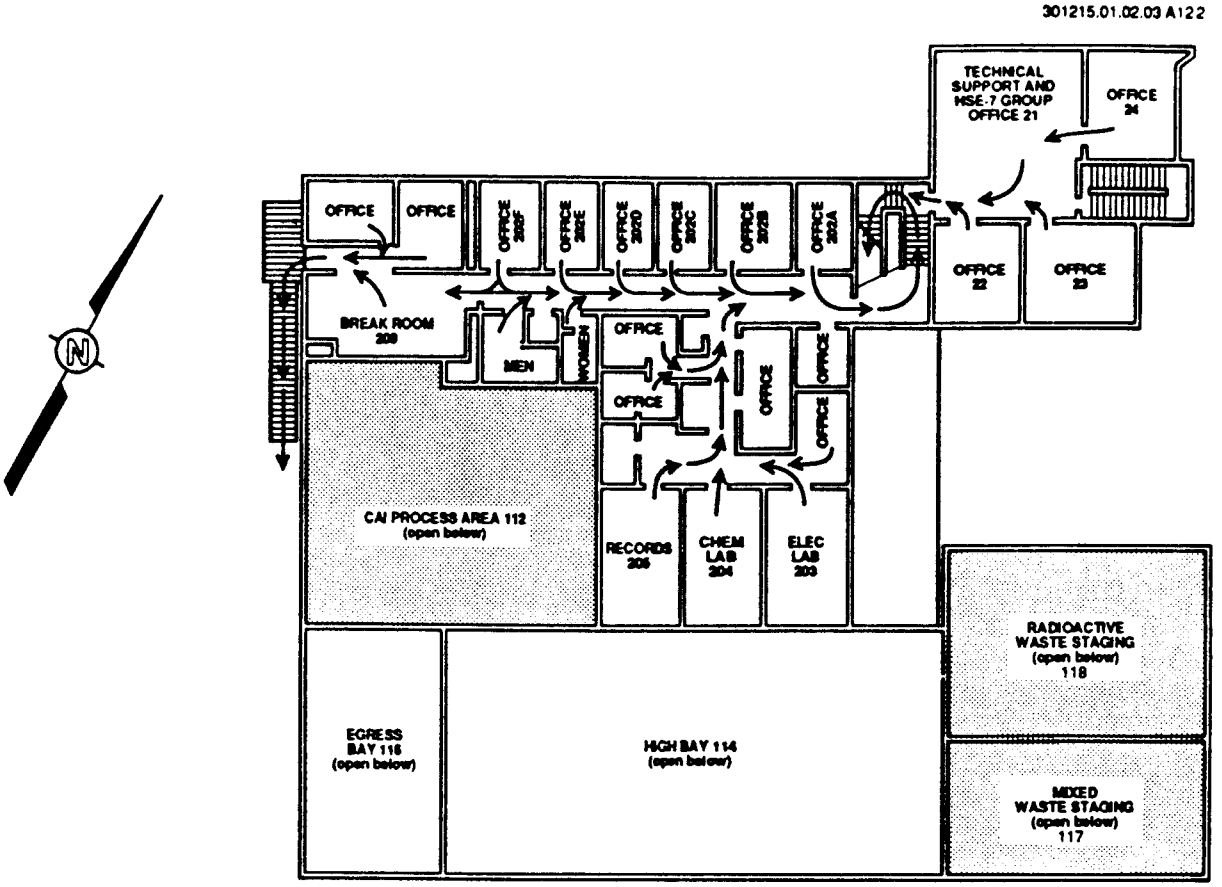
Figure 12. Evacuation routes and muster areas at TA-50-37, first floor .



SECOND FLOOR

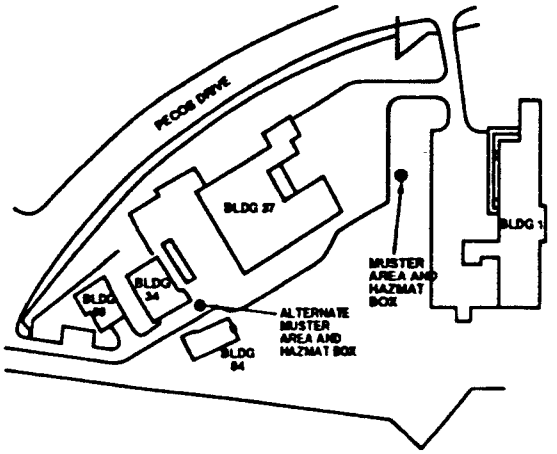
LEGEND

↑ EVACUATION ROUTE

● MUSTER AREAS

▭ MIXED WASTE UNIT

TA-50, BLDG 37
CONTROLLED AIR INCINERATOR
FACILITY EMERGENCY PLAN
EVACUATION MUSTER AREAS
AND HAZMAT INFORMATION BOXES



NOT TO SCALE

Figure 13. Evacuation routes and muster areas at TA-50-37, second floor .

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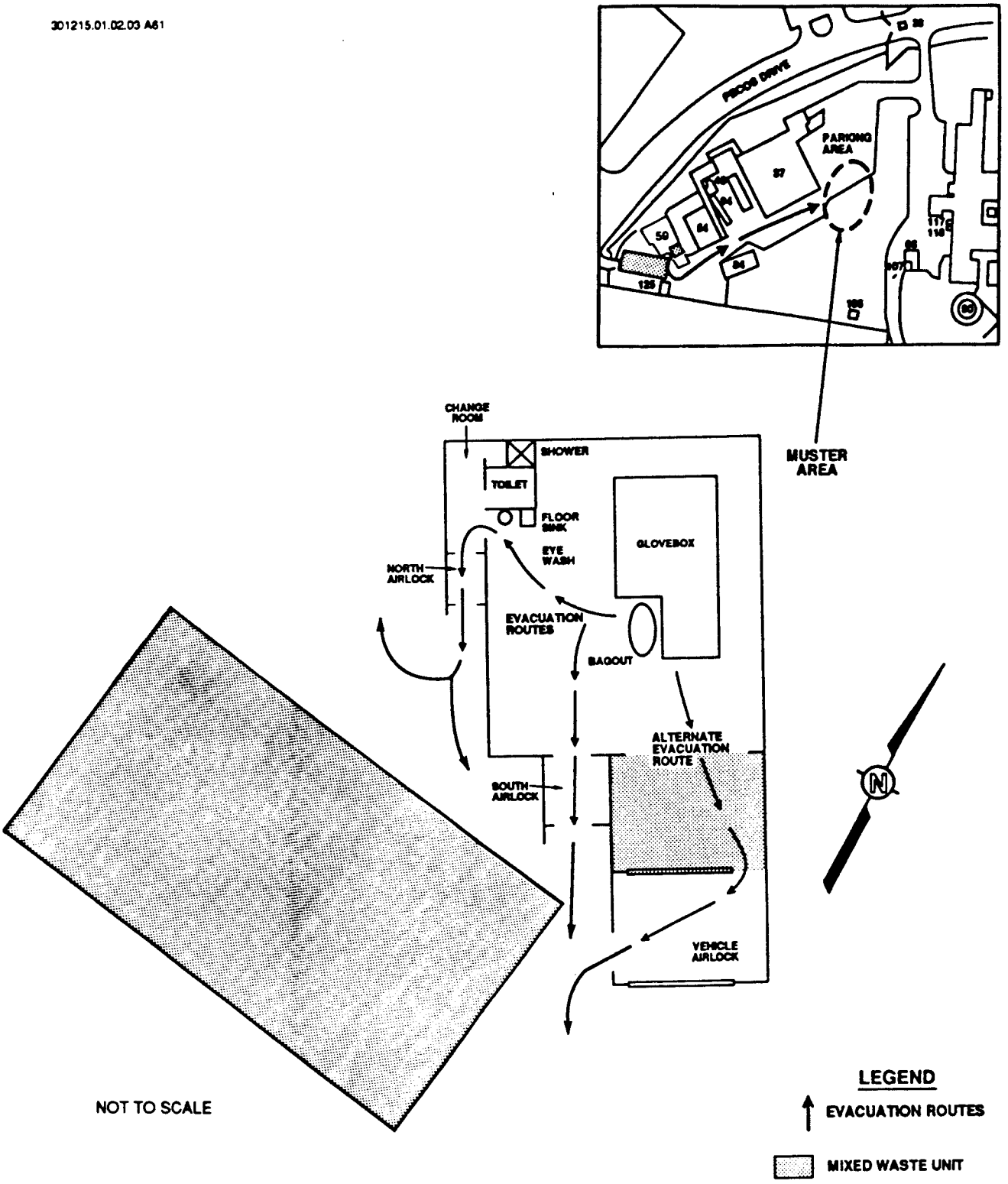


Figure 14. Evacuation routes, alternative evacuation route and muster area at TA-50-69.

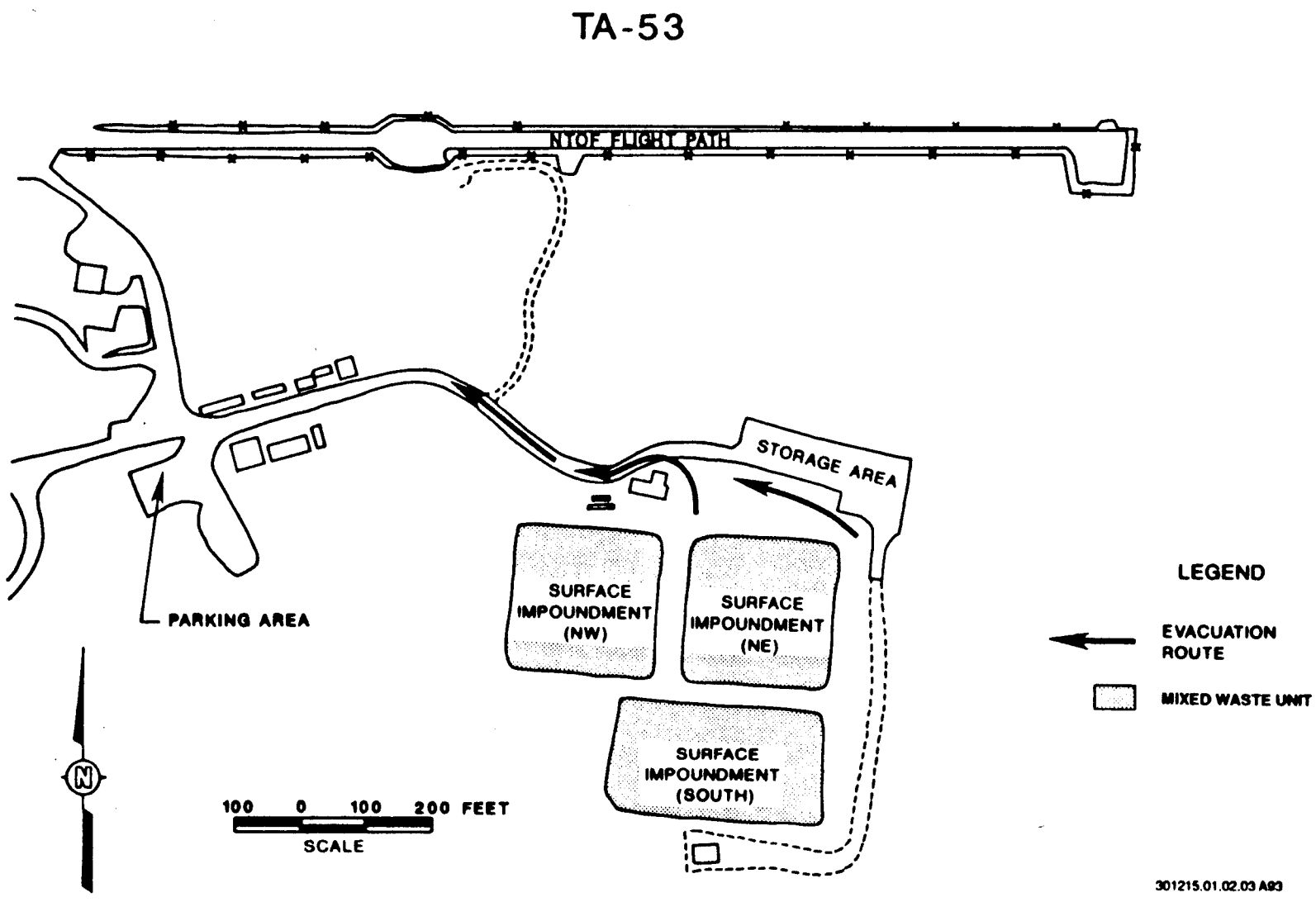
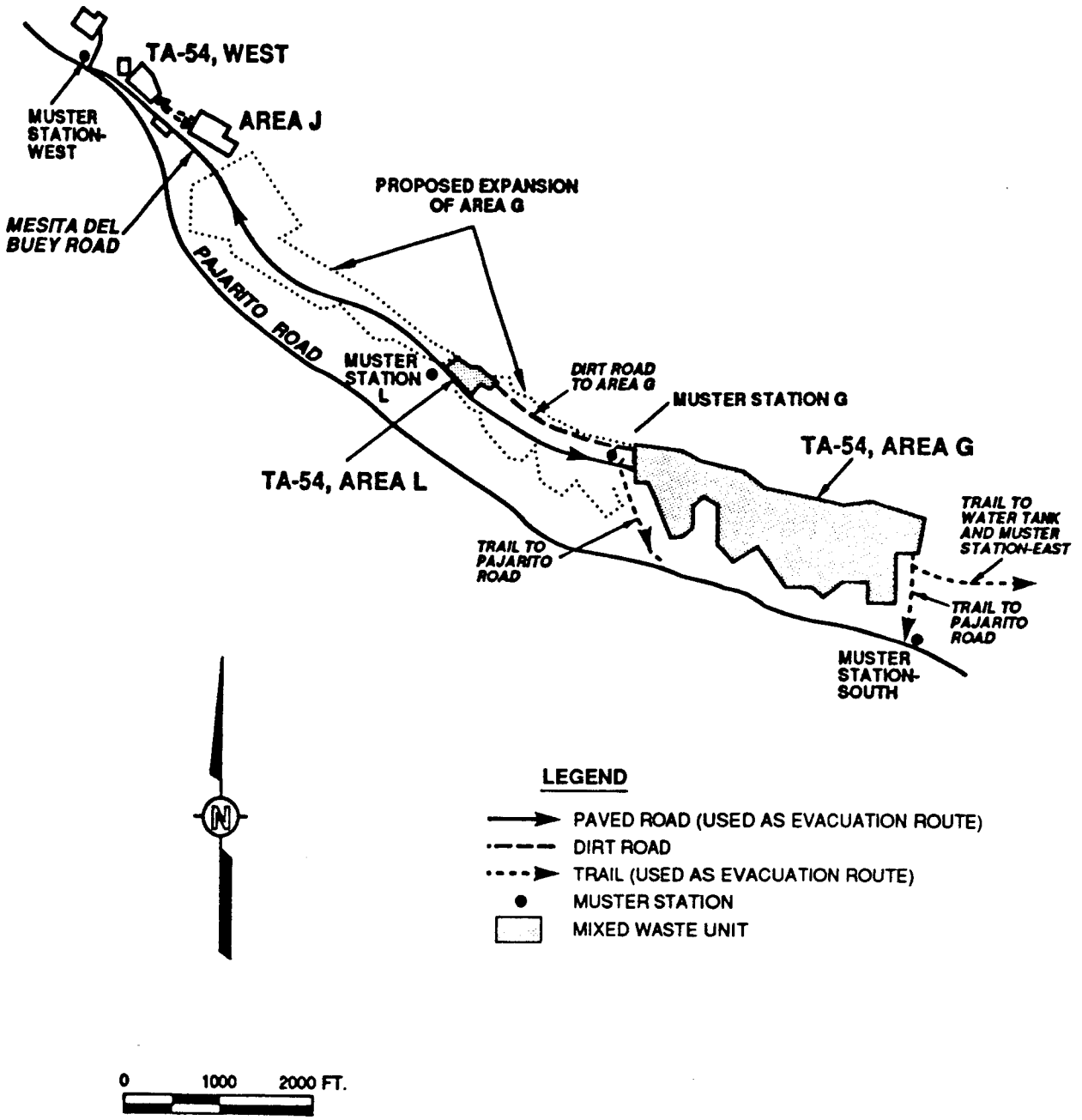


Figure 15. Evacuation route at TA-53-166 surface impoundments.



Reference: modified from Benchmark Environmental Corporation, prepared for Los Alamos National Laboratory 11-12-90.

Figure 16. Evacuation roads and trails and muster stations at TA-54, Areas G and L.

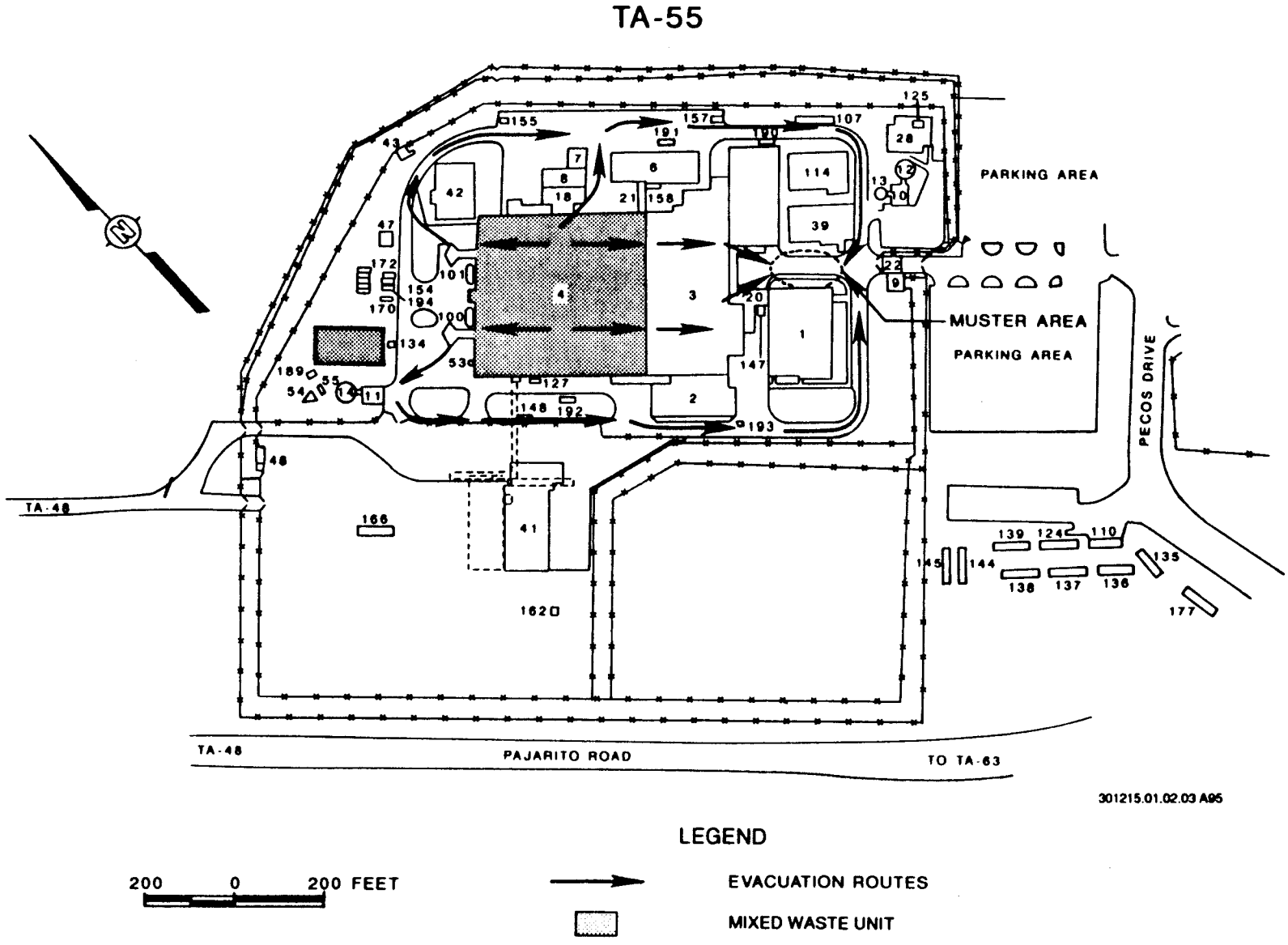


Figure 17. Muster area at TA-55-4.

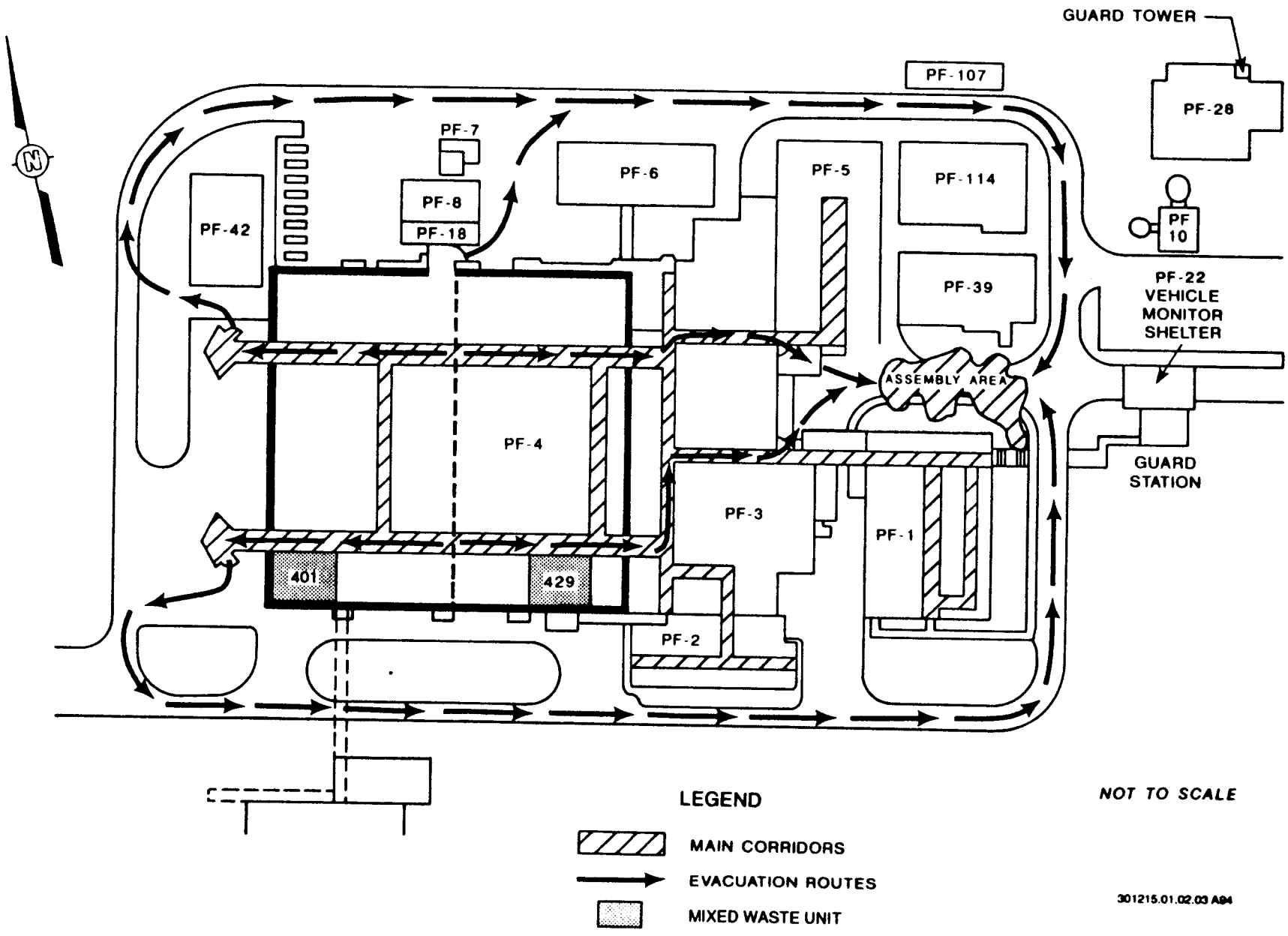


Figure 18. Evacuation routes at TA-55-4, first floor.

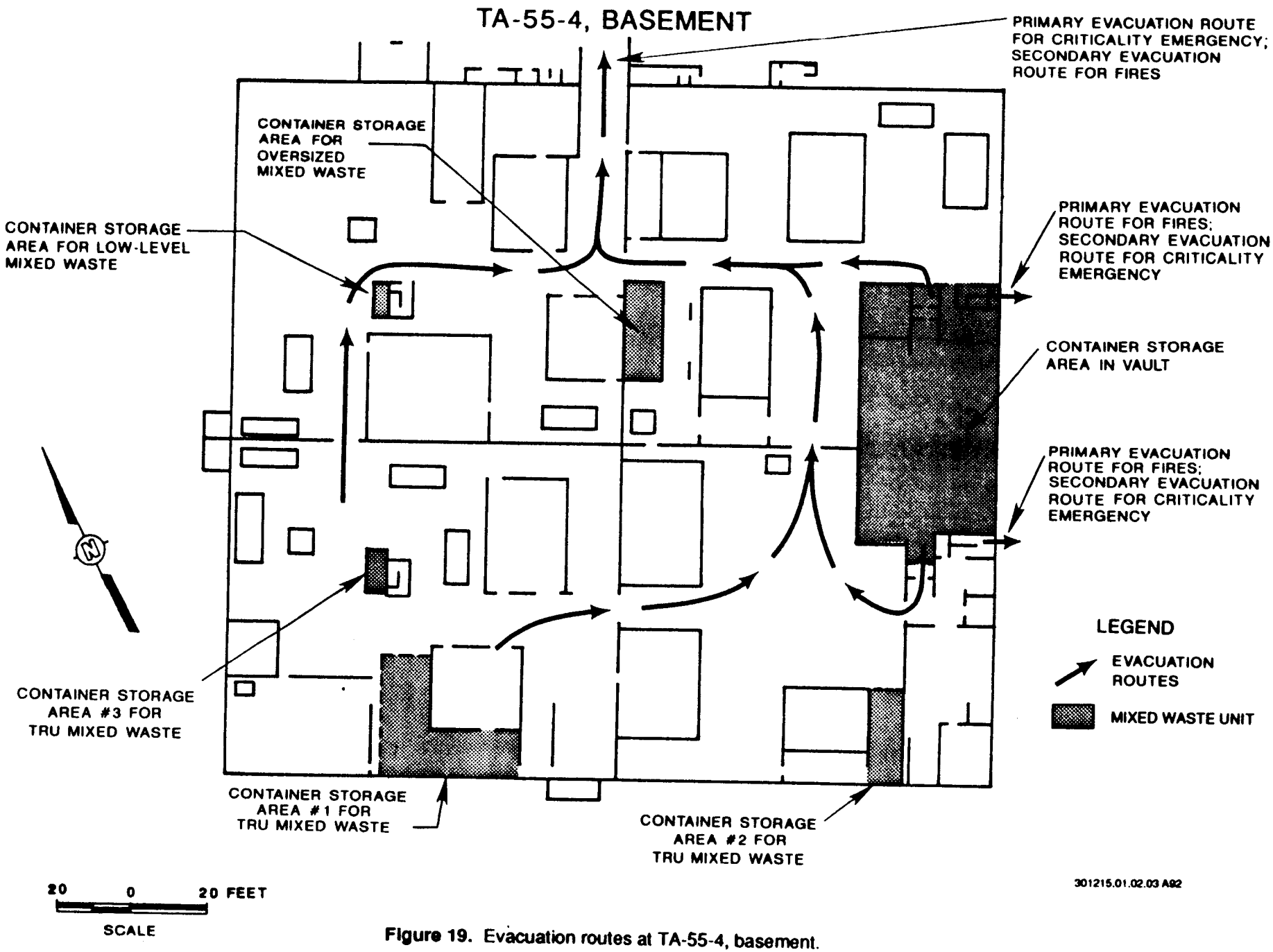


Figure 19. Evacuation routes at TA-55-4, basement.

APPENDIX A

PROPOSED STATEMENT OF THE WORK IN "REQUEST FOR PROPOSAL" FROM LOS ALAMOS NATIONAL LABORATORY TO LOS ALAMOS FIRE DEPARTMENT

1 STATEMENT OF

I. SERVICES TO BE PROVIDED

A. Work Scope

1. The Contractor shall provide personnel to operate the Department of Energy-owned Los Alamos Fire Department to provide fire suppression, emergency medical, rescue and fire prevention services for the Los Alamos Fire Department Service Area.

B. Fire Suppression Services

1. The Contractor shall provide fire suppression services for the Los Alamos National Laboratory Fire Service Area (LANL-FSA), Municipal Development Area-Municipal Fire Services, and for brush and forest fires within the Los Alamos Fire Department Service Area. (See Attachment D). The Contractor shall not provide these services to areas outside the above-mentioned areas unless required by mutual-aid agreements to which the County or the DOE is, or becomes a party.

2. The Contractor shall provide these fire suppression services to meet the requirements of this contract, Federal Aviation Administration (FAA), 14 CFR Part 139 and NFPA 1500, as modified in Annex A to the Statement of Work.

3. The Contractor shall develop and submit to the Contracting Officer for approval a personnel and equipment response procedure for all areas within the LANL-FSA within 30 days after award of contract. The responses to the LANL-FSA will comply with NFPA requirements and should take into account facility programmatic importance and hazards. In developing the response procedures, the Contractor shall take into account available personnel and equipment, overall needs throughout the Fire Department Service Area, and efficient use of personnel and equipment.

C. Emergency Medical and Rescue Services

1. LANL-FSA Area - The Contractor shall provide emergency medical and rescue services, as set forth herein. Ambulance service shall be under the program direction of Emergency Room physicians practicing at the Los Alamos Medical Center. These services shall meet all standards required by DOE and as further outlined in New Mexico State General Order No. 35, and State Regulation No. HED 85-4 (HSED), as they may be amended

from time to time. Statutory authority for these regulations is contained in the Emergency Medical Services Act, Section 24-10B-1 to 10B-11, New Mexico Statutes Annotated, 1978, and Section 9-7-6, New Mexico Statutes Annotated, 1978.

2. All Other Areas - The Contractor shall provide a level of service which at a minimum complies with applicable federal and state laws, and local ordinances.

3. Personnel and Equipment Emergency Response - The Contractor shall normally provide a minimum response of:

Equipment/Number	Number of Personnel
Ambulance/One (1) Unit	2
Rescue/One (1) Unit	2
Total Equipment/Two (2) Units	4*

*At least one (1) of the responding personnel shall be certified, as a minimum, as IV Technician.

4. Non-Emergency Services - The Contractor may provide medical transport services between treatment facilities in Los Alamos and nearby communities subject to the following restrictions:

   a. Services can be provided by standby equipment and off-duty personnel.

   b. The use of on-line equipment and on-duty personnel is authorized only when requested by medical authorities and the situation is life-threatening.

   c. When on-line equipment and personnel are used for medical transport, it will be the responsibility of the Fire Department's senior person on duty to assure that adequate personnel remain on duty or are called to duty to provide the minimum manning levels set forth in the response procedures for fire suppression, emergency medical and rescue services.

5. Emergency Medical and Rescue Services Operating Procedures-

   The Contractor shall develop and implement written operating procedures for emergency medical and rescue services to be provided by the Fire Department. The procedure shall cover equipment assignment to stations, personnel training; response manning, including personnel qualifications; guidelines for dispatching of

equipment within and outside the Los Alamos Fire Department Service Area; and billing and collection of ambulance and rescue services revenues. The Operating Procedure shall be submitted to the Contracting Officer within 90 days after award of the contract and updated as required or as directed by the Contracting Officer.

D. Communications and Dispatch

The Contractor shall be responsible for the operation of all radio and telephone systems provided by the Government under this contract. In addition, the Contractor shall be responsible for the dispatch of equipment and personnel to emergencies. Written procedures shall be developed and implemented setting forth procedures to be followed by Fire Department personnel for receiving alarms, dispatching of equipment, and tracking and coordinating of the equipment after dispatching. The Contractor shall assure that communications equipment utilized by the Fire Department has the ability to contact other agencies within the Los Alamos Fire Department Service Area, and areas covered by mutual-aid agreements, including the ability to contact off-duty personnel. Communication and dispatch procedures shall be submitted to the Contracting Officer for approval within 60 days after award of contract.

The DOE will provide the Contractor the use of one radio frequency, 167.925 MHz on the federal band for responses to emergencies that fall within the scope of this Contract. The Contractor shall obtain additional radio frequencies from the International Municipal Signal Association (IMSA), civilian band frequencies, if required, to meet the requirements of this Contract. The Contractor will allow the DOE to use Contractor controlled radio frequencies in order to interface with Contractor and DOE interests at the LANL.

The Contractor shall comply with the requirements of NFPA 1221, Installation, Maintenance and Use of Public Fire Service Communications Systems, and NFPA 72F, Installation, Maintenance and Use of Emergency Voice/Alarm Communications Systems in providing services as required by this Contract.

II. ORGANIZATION AND MANAGEMENT

A. The Contractor shall develop and maintain an organization to efficiently and effectively meet the staffing requirements of the Contract.

B. The Contractor shall prepare an organization chart that shows lines of authority and relationships of the Contractor's organizational structure that provide direct and indirect support to the Fire Department The chart should also include outside organizations such as support from fire departments obtained from mutual-aid agreements, support services provided by DOE through its contractors, such as the University of California, the Forest Service, and other subcontractors.

Additionally, the Contractor shall prepare an organization chart which depicts the line functions of each position, and lines of authority of all positions assigned to the Fire Department. The organization chart shall be supported by a narrative statement which describes the function, responsibility, and authority of each position assigned to the Fire Department.

C. Prior to implementing any changes to the Fire Department organization, the Contractor will submit for the Contracting Officer's approval, any proposed revisions to the approved organizational structure, organization chart and narrative and obtain written Contracting Officer approval for the proposed revisions.

III. BUDGETING AND COST MANAGEMENT

A. BUDGET - The Contractor shall prepare a yearly budget to cover the Government's fiscal year, which begins on October 1 and ends on September 30 of the following calendar year, and submit to the Contracting Officer for approval. The budget shall be submitted to the Contracting Officer no later than September 30th of each year and shall cover the fiscal year starting on October 1 of the coming fiscal year and the two following fiscal years e.g. the submission for FY 1992 would include FY 1993 and FY 1994 and would be submitted by September 30, 1991. The budget shall be prepared in a line-item type of format that is approved by the Contracting Officer. Each line-item in the budget shall be supported by a narrative description for each type of cost items that make up each individual line of the budget. The budget shall include all work to be performed for operating expense, capital equipment and capital plant fund types. The requirements of Order DOE 5100.3, Planning, Programming and Budgeting, shall be followed in preparing the budget.

The budget shall be updated by the Contractor as requested by the Contracting Officer. The updates shall reflect the actual costs incurred by the Contractor for each of the previous periods of the fiscal year and the Contractor's projections for the remainder of the fiscal

Increases or decreases of the amounts for any of the line-items shall be supported by reasons causing the variances. Projected overruns or any of the line-items that exceed 10% of the line-item amount or $50,000, whichever is less, shall be reported to the Contracting Officer in writing immediately when the projected overrun is discovered. The Contractor shall establish a system that will enable the development of budget projections and tracking of costs for each line-item in the budget on a minimum of a monthly basis or as required to provide budget and cost control of funds.

B. COST MANAGEMENT - The Contractor shall implement a cost management system that will enable each element or organization within the County to charge costs for expenditure of funds to each applicable line-item of the budget. The system to be used by the Contractor shall be submitted to the Contracting Officer for approval within 30 calendar days after award of the contract.

The cost management system shall allow coding by an originator of a fund expenditure request, such as purchase and work orders, contract, etc., and approval of the coding and fund expenditure by a person designated by the Contractor to approve the expenditure and to have a tracking system that can account for all funds expended on a given order.

The Contractor shall provide the Contracting Officer a monthly report which shows the fund status as of the predetermined cut-off date of each month. The report shall show a description of the expenditure, amount of funds committed,and funds costed or paid out. Costs shall be reported by each line-item and sub-item in the approved budget. The report shall be submitted to the Contracting Officer no later than 10 working days following the end of each month.

IV. PERSONNEL MANAGEMENT

The Contractor shall develop and implement a plan for personnel management of all Fire Department personnel which, at a minimum, covers the following areas:

1. Organization for personnel management
2. Position classification and job analysis
3. Compensation and benefits
4. Human resource planning
5. Equal employment and affirmative action
6. Recruitment and selection
7. Personnel assignments
8. Performance appraisal
9. Personnel development

In development of the personnel plan, th contractor shall incorporate applicable requirements of th contract. Submission of the plan for Contracting Offi approval shall be 60 calendar days after award of the Contract.

V. SECURITY PLAN

The Contractor shall develop a Security Plan to assure that persons not possessing a DOE "Q"clearance are not allowed access to classified matter or special nuclear material. See Contract Clauses entitled DEAR 952-204.2 , Security Requirements and DEAR 952.204-70, Classification.

The Security Plan shall set forth the procedures that will be used by the Contractor to comply with the requirements of each particular clause.

The Plan shall be submitted to the Contracting Officer for approval 30 days after award of the contract.

VI. PROPERTY MANAGEMENT

A. Property Management System - The Contractor shall develop and implement a system to track, inventory, report, and maintain all Government property as defined by the Contract clause entitled "Government Property (Cost Reimbursement, Time-and Materials, or Labor-Hour Contracts)" to be used by the Contractor in performing work as required by the contract. The system shall be in writing and shall as a minimum set forth procedures for:

1. Accountability of property
2. Inventory management
3. Responsibility for protection and safeguarding
4. Utilization/Disposal
5. Identification
6. Maintenance
7. Records/reporting
8. Inspection
9. Loan policy

Property Management Program Plan - The Plan which sets forth the Contractor's property management system shall be submitted to the Contracting Officer for approval not later than 60 calendar days after award of contract.

B. Personal Property Controls

1. Non-capital equipment

a. Non-capital equipment is defined as those items of nonexpendable personal property with a unit acquisition cost of between $1,000 and $4,999 and having a life of one year or more.

b. Property management information is to be maintained to support interrelated systems and programs such as maintenance, calibration, equipment pools, inventory, loans, storage, and excess reporting.

c. Acquisition value shall be available to support reporting of the equipment through the disposal process.

d. Each item of equipment shall be identified as U. S. Government property by a tag or marking and shall be assigned a specific property control number.

2. Sensitive Items

a. Sensitive items are defined as those items of property with a unit acquisition cost of $200 or more, except for firearms or other property where a safety or security consideration requires additional controls regardless of dollar value, which are considered to be susceptible to being appropriated for personnel use or which can be readily converted to cash.

b. The Contractor shall evaluate items in the $1,000-$4,999 range which should be added to the sensitive items list. Examples of these items include personal computer units and associated components, software, radios, electronic equipment, etc.

c. Non-sensitive property management record data similar to non-capital equipment should be established.

d. Each item of equipment shall be identified as U.S. Government property by a tag or marking and shall be assigned a specific property control number.

3. Capital Equipment

a. Capital equipment is defined as those items of nonexpendable property with a unit acquisition cost of $5,000 or more.

b. The Contractor shall include in the property management system procedures to record information, system data, property accountability, policies, etc., to meet the requirements as set forth in AL Property Management Instructions.

c. Each item of equipment shall be identified as U.S. Government property by a tag or marking and shall be assigned a specific property control number.

4. Motor Equipment (Vehicles)

a. The Contractor shall develop policies and procedures for economical and efficient management and control of Government-owned motor vehicles and motor vehicles rented or leased to the Government, including reportting, registration, official use, and identification to comply with the applicable requirements of Federal Property Management Regulations, Part 101.28, Subchapter G, and Department of Energy Property Management Regulations, Subchapter G, Transportation and Motor Vehicles.

b. Each vehicle shall be identified as U.S. Government property by a tag or marking and shall be assigned a specific property control number.

C. Real Property

1. The terms real property and real estate are synonymous and are defined as land and anything permanently affixed to the land such as buildings, fences, and those things attached to buildings such as lighting fixtures, plumbing and heating fixtures, etc.

2. The Contractor shall develop and implement a real property management system to administer, inventory, and report real property provided by DOE to the Contractor, to meet the requirements of Order DOE 4300.1B, Real Property and Site Development Planning.

3. The Contractor shall develop and implement a maintenance management program to meet the requirements of Order DOE 4330.4A, Real Property Maintenance Management and Order DOE AL 4330.4A, Maintenance of Property.

VII. TRAINING AND PROFESSIONAL DEVELOPMENT

A. Training Program

1. The Contractor shall develop, implement, and administer training programs that will include a new hire training program, an in-service training program, qualification levels, and a certification program for all levels of training.

2. The Contractor shall appoint a full-time Training Officer responsible for overseeing all training and training-related qualifications, certifications, records, and reports required by this contract.

3. The Contractor shall develop the following training programs to maintain the minimum required level of service:

   (a) Management training for supervisory officers in accordance with NFPA 1021.

   (b) Recruit training which meets NFPA 1001, Standards for Fire Fighter 1, 2, and 3.

   (c) Fire Officer training which complies with the requirements of NFPA 1021, Standards for Fire Officer Professional Qualification, will be required prior to promotion into the officer ranks.

   d) Company training which includes fire fighting tactics and strategy, hose evolutions, salvage techniques, ladder drills, hazardous materials, live fire drills, mountain rescue, relay operations, aircraft crash fire rescue training, apparatus pump operators training, and familiarization with fire suppression and detection systems. Fire apparatus driver/operator professional qualifications shall be in accordance with NFPA 1002 (1982). Airport fire fighter professional qualifications shall be in accordance with NFPA 1002 (1978) and Federal Aviation Administration, 14 CFR 139.

   (e) Pre-fire training which provides a comprehensive working knowledge of building protection, including technical indoctrination of nuclear criticality, radiation protection, explosives, large electrical installations, and LANL experimental facilities. Approved pre-fire plans shall augment this training.

   (f) Advanced life-support training including IV Technician training in accordance with NFPA 1004.

   (g) Training on the safe and proper operation of vehicles by all personnel during normal and emergency use. As a major objective, a training program shall be established to minimize the incidence of injuries, vehicle accidents, and abuse of vehicles in accordance with NFPA 1002.

(h) Training for hazardous-materials response shall be in accordance with NFPA 471 and 472; and OSHA 29 CFR 1910.120. All Fire Department personnel that will respond to emergencies will receive training to meet the first responder awareness and first responder operational levels as a minimum. The DOE will provide training, as required, for those responses to the LANL-FSA that involve specific types of hazardous materials that are unique to LANL operations.

(i) Training for administrative and technical support personnel assigned to the Fire Department.

B. Training Plan

The Contractor shall develop a Training Plan to comply with NFPA requirements. The Training Plan shall be submitted to the Contracting Officer for approval within 60 days after award of contract.

C. Training Records

The Contractor shall establish and maintain training records and a certification program that will document specific qualifications and proficiency levels maintained for all personnel involved in fire suppression, emergency medical, and rescue operations.

D. Training Exercises

The Contractor shall conduct exercises to assure competency in all assigned responsibilities, training, and qualification levels. In addition, the Contractor shall participate in exercises conducted by DOE for purposes of evaluating fire suppression, emergency medical, and rescue services response effectiveness. These exercises shall be conducted on at least a yearly basis and should cover all types of emergencies that the Fire Department responds to.

VIII. EMERGENCY MANAGEMENT

A. Incident Command System (ICS)

1. In connection with providing the services described herein, the Contractor shall implement an ICS. For incidents involving the LANL-FSA, the Contractor shall use the National Incident Command System as promulgated by the National Fire Academy and shall incorporate the requirements of DOE's Los Alamos National Laboratory Emergency Response Plan, revision dated May 1989.

for incidents outside the LANL-FSA, the Contractor shall develop and implement ICS which describes the overall features of the system.

2. In connection with responding to incidents within the LANL-FSA, when the Fire Department is the first responder on the scene, the Fire Department's ranking officer shall be the Incident Commander. Upon arrival at the scene by a higher ranking officer, incident command will be transferred as set forth in the Fire Department's ICS. The Fire Department's Incident Commander will remain in charge of an incident as long as the incident remains a fire-related incident. If the incident involves hazards other than fire, and the LANL's On-Scene Control Commander has determined that an On-Scene Control Group is required, then the Fire Department's Incident Commander shall transfer command of the incident to the LANL's On-Scene Commander (OSC). The Fire Department's ranking officer at the scene will remain in command of all the Fire Department's elements at the incident scene and will provide fire suppression emergency and rescue services as requested by the OSC.

3. The ICS shall be established and written procedures developed to apply to all Contractor personnel involved in emergency operations. The ICS shall, as a minimum, identify training for emergency situations, safety, chain-of-command, and special hazards. The ICS procedures shall be submitted to the Contracting Officer for approval within 60 days after award of contract.

B. Occurrence Reporting

The Contractor shall develop and implement occurrence reporting procedures that comply with the requirements of Order DOE 5000.3A, Occurrence Reporting and Processing of Operations Information. This requirement is applicable to all Fire Department facilities and operations covered by this contract.

IX. CONTINUITY OF OPERATIONS

A. In addition to complying with the requirements of the contract clauses entitled "Continuity of Services" and "Notice to the Government of Labor Disputes," the Contractor shall take the actions required herein to assure a continuation of services under this contract. Any threat to the maintenance of required personnel staffing as a result of a potential or threatened work

stoppage or other collective action shall be promptly reported to the Contracting Officer. The Contractor shall take all reasonable steps to minimize potential threats to operational continuity by providing for adequate planning and execution of emergency services.

B. The Contractor shall prepare a written Contingency Plan within 90 days after award of contract and submit it to the Contracting Officer for approval. The Contingency Plan shall recognize all joint resources available to the parties of this contract, and shall address the Contractor's approach to providing critical services in the event of a work stoppage or labor dispute. In addition, the Contractor shall coordinate resources that could be provided by University of California or ~~Pan Am~~ World Services personnel in preparation of the Contingency Plan. This Contingency Plan shall be updated periodically as deemed necessary or prudent by the contracting parties, and any changes to the Plan will be subject to the approval of the Contracting Officer.

C. When a strike or work stoppage is threatened or appears likely, the Contractor shall immediately provide the notice required above, and with the approval of the Contracting Officer, commence implementing necessary elements of the approved Contingency Plan.

X. PRE-FIRE PLANNING FOR FIRE SUPPRESSION

A. LANL-FSA Area. The Contractor shall implement a Pre-Fire Planning Program to develop and maintain pre-fire plans for incidents which the Fire Department responds to. A list of LANL Key facilities, in priority order, shall be provided to the Contractor by the Contracting Officer for development of pre-fire plans within the LANL-FSA. The Contractor shall develop pre-fire plans for all LANL facilities starting with the priority facilities on the listing. The pre-fire planning shall include development of plans for wild-land fires and support provided by Fire Department to explosive or other LANL test programs.

B. All Other Areas. The Contractor shall develop pre-fire plans on a scope and frequency to be developed by the Contractor.

C. Two Copies of all approved pre-fire plans and revisions thereto, for the LANL-FSA, shall be provided to the Contracting Officer for DOE use.

D. Each pre-fire plan within the LANL-FSA developed by the Contractor shall be submitted to the Contracting Officer

for review and security classification. The Contractor shall protect all pre-fire plans as required by the assigned classification.

All pre-fire plans within the LANL-FSA will, as a minimum, be handled as Unclassified Controlled Nuclear Information (UCNI) documents.

E. A Pre-Fire Planning Program Plan shall be developed by the Contractor and submitted to the Contracting Officer for approval within 30 days after award of the contract. The Contractor shall update the Plan as required to reflect any proposed changes to the Plan or as directed by the Contracting Officer.

XI. MUTUAL-AID AGREEMENTS

A. DOE is a party to one mutual-aid agreement--Memorandum of Agreement for Mutual Fire Protection, MOU DE-GB32-89AL57296. The Contractor shall be responsible for complying with DOE's commitments of this mutual-aid agreement as they apply to the services provided by the Fire Department.

B. During the term of this Contract, DOE may enter into additional mutual-aid agreements for which responsibility will be assigned to the Contractor under this contract, or the Contractor may, with DOE's approval, enter into mutual-aid agreements which will be carried out as part of the Contract work. The parties will determine, at the time such agreements are entered into, whether they constitute a change to the contract requiring an adjustment in the estimated price of the Contract.

C. It is contemplated by the parties that the Contractor will enter into mutual-aid agreements with local governments, federal agencies, Indian Pueblos, or other entities whose jurisidictional authority is adjacent to the Los Alamos Fire Department Service Area, when DOE determines that such mutual-aid agreements will enhance the services required under this Contract and will not interefere with the performance of services to the LANL-FSA.

D. In connection with any existing or future mutual-aid agreement, if any the costs of which will be allowable under this Contract, the Contractor shall obtain the prior written approval of the Contracting Officer before carrying out any of the following actions:

1. Conducting discussions or negotiating with the objective of entering into an agreement;

2. Executing an agreement; or

3. Providing any services pursuant to an existing, DOE-approved agreement which are not expressly required by the agreement.

XII. NON-EMERGENCY SERVICES

A. Fire Prevention Services - The Contractor shall provide fire prevention inspections of all facilities in the LANL-FSA , DOE owned or leased facilities in the Los Alamos Fire Department Service Area, and those structures listed in Attachment E. The fire prevention inspections shall follow the requirements of Order DOE 5480.7, Fire Protection. In performing these inspections all Fire Department personnel should participate in fire prevention activities from the viewpoint of familiarization of personnel with buildings and locations of where to fight fires, identify hazards and check fire prevention equipment. In performing these inspections the NFPA Inspection Manual shall be used as a guide in establishing the inspection program and performing inspections. The program shall be in written form. Results of inspections will be provided to the Contracting Officer for enforcement.

Additionally, the Contractor shall review and provide input on design drawings for new or remodeled facilities at the LANL. The Contractor shall be a participant on all final acceptance inspections of all facilities at the LANL and will be responsible for recommending to the Contracting Officer acceptance of a facility, new or remodeled, and that its features comply with DOE requirements for safety and fire matters.

B. Fire Hydrant Flow Testing

1. LANL-FSA Area - The Contractor shall provide annual flow testing of all fire hydrants located on DOE property, and those used to protect property which DOE leases within Los Alamos County, in accordance with NFPA 291, latest edition. The reports of these flow tests shall be delivered to the Contracting Officer within 30 days of completion of the tests.

2. All other areas of Los Alamos County - The Contractor shall determine the scope for testing of fire hydrants on Los Alamos County property, and comply with those requirements as necessary.

3. The Contractor shall develop and implement written procedures for fire-hydrant testing to be used by the Fire Department to comply with this requirement and submit to the Contracting Officer for approval within 45 calendar days after award of the contract.

C. Standby Services

1. Los Alamos Airport - The Contractor shall comply with applicable Federal Aviation Administration (FAA), 14 CFR PART 139, Regulations for General Aviation Activities and shall comply with applicable FAA, DOE, or Department of Defense (DOD) directives and regulations for specialized support for special cargo flights to suppress any fire or accomplish any rescue from take-off or landing operations.

2. LANL-FSA Area - The Contractor shall provide stand-by personnel and equipment for specific activities as deemed necessary and requested by the Contracting Officer.

3. All Other Areas - The Contractor shall provide standby personnel and equipment for specific activities as deemed necessary by the Contracting Officer.

4. Fire Evacuation Exercises - The Contractor shall provide standby personnel and equipment for building evacuation exercises on an on-call basis subject to availability of personnel and equipment.

D. Non-Emergency Alarms - The Contractor shall respond to non-emergency alarms (automatic fire protection system supervisory and trouble alarms), within a reasonable period of time, normally not to exceed fifteen (15) minutes.

XIII. OPERATIONAL PROCEDURES

A. GENERAL - The Contractor shall develop and implement procedures to be used for the daily operations of the Fire Department. These procedures shall set forth how the Fire Department operations will be managed, organized, and conducted to assure compliance with requirements of this contract.

B. In the development of these operational procedures, the Contractor shall utilize specific procedures developed by the Contractor in meeting the requirements of this contract. In addition, applicable requirements of Order DOE 5480.19, Conduct of Operations Requirements for Facilities, shall be used as a guideline to assure that the conduct of operations meets DOE guidelines and that

adequate written documentation exists t. demonstrate the Contractor's conformance to these requirements.

C. Procedures developed to meet the requirements of this section shall follow a standard format. The procedures shall be placed in a loose-leaf type binder so that revisions or additions may be made as they occur. Each procedures manual shall be controlled copies and a procedure established to keep track of manuals and distribution of changes thereto.

Electronic versions of the manual that can be used by IBM, MS-DOS personal computers will be developed by the Contractor at the earliest time possible.

APPENDIX B

POLICY AGREEMENT BETWEEN LOS ALAMOS NATIONAL LABORATORY AND LOS ALAMOS POLICE DEPARTMENT

Re-keyed for legibility;
original attached.

STATEMENT OF POLICY AND AGREEMENT BETWEEN THE LOS ALAMOS AREA OFFICE OF THE ATOMIC ENERGY COMMISSION AND LOS ALAMOS COUNTY RELATIVE TO TRAFFIC CONTROL AND RESPONSE BY THE LOS ALAMOS POLICE DEPARTMENT

I. Traffic Regulation on AEC Roads and Streets

a. Only the following roads and streets, but no parking areas, on AEC land in Los Alamos County are considered by the AEC to be open to the public for purposes of enforcement of State laws and County ordinances with respect to traffic. The Los Alamos County Police Department will enforce those laws and ordinances on the following specified roads and streets.

1. Diamond Drive from the north end of the bridge to the intersection of Diamond Drive and Pajarito Road.

2. Pajarito Road from Diamond Drive to State Road No. 4.

3. East Jemez Road from Diamond Drive east to the Los Alamos County line.

4. West Jemez Road from Diamond Drive west to State Road No. 4.

5. West Road from Diamond Drive to intersection with West Jemez Road.

b. Traffic control on all other AEC roads and streets, and in all AEC parking areas, is the responsibility of the AEC/LAAO Protective Force.

II. Traffic Control During Emergencies

a. For the control of traffic on the above specified roads and streets the Los Alamos Police Department will provide initial action. For sustained or large area control, support may be provided by auxiliary police or other personnel subject to Los Alamos Police Department direction, or by the AEC/LAAO Protective Force in cooperation with the LAPD.

b. On all other AEC roads and in all AEC parking areas traffic control will be under the direction of the AEC/LAAO Protective Force. Some support may be available from the LAPD in cooperation with the Protective Force.

Re-keyed for legibility;
original attached.

III. Notification of Los Alamos County Police Concerning Accidents and Other Matters

In the event of possible or suspected criminal violation of applicable state law or county ordinance not primarily of security interest (for example, a traffic accident involving hit-and-run, driving under the influence of intoxicating liquor or drugs or reckless driving, a serious industrial accident, unattended death, etc.) the Los Alamos Police Department is to be notified by the AEC/LAAO Protective Force Duty Officer. The Police Department will respond to and investigate only such accidents as required by state law or county ordinance.

IV. Use of Telephone Number 911

Nothing in this agreement is intended to preclude the use of telephone number 911 by any person to obtain immediate response by the police, fire department, ambulance etc. to appropriate emergencies.

Los Alamos County	Atomic Energy Commission Los Alamos Area Office
Date	Date

[Original signed on 12/17/74 and 11/20/74]

*Paragraph III changed to permit notification to LA Police Department by ADTS (Fisher/Peck letter, April 14, 1983). A copy of this letter is attached.

STATEMENT OF POLICY AND AGREEMENT BETWEEN THE LOS ALAMOS AREA OFFICE OF THE ATOMIC ENERGY COMMISSION AND LOS ALAMOS COUNTY RELATIVE TO TRAFFIC CONTROL AND RESPONSE BY THE LOS ALAMOS POLICE DEPARTMENT

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b. Traffic control on all other AEC roads and streets, and in all AEC parking areas, is the responsibility of the AEC/LAAO Protective Force.

II. Traffic Control During Emergencies

a. For the control of traffic on the above specified roads and streets the Los Alamos Police Department will provide initial action. For sustained or large area control, support may be provided by auxiliary police or other personnel subject to Los Alamos Police Department direction, or by the AEC/LAAO Protective Force in cooperation with the LAPD.

b. On all other AEC roads and in all AEC parking areas traffic control will be under the direction of the AEC/LAPS Protective Force. Some support may be available from the LAPS in cooperation with the Protective Force.

III. Notification of Los Alamos County Police Concerning Accidents and Other Matters

In the event of possible or suspected criminal violation of applicable state law or county ordinance not primarily of security interest (for example, a traffic accident involving hit-and-run, driving under the influence of intoxicating liquor or drugs or reckless driving, a serious industrial accident, unattended death, etc.) the Los Alamos Police Department is to be notified by the AEC/LAPS Protective Force Duty Officer. The Police Department will respond to and investigate only such incidents as required by state law or county ordinance.

IV. Use of Telephone Number 911

Nothing in this agreement is intended to preclude the use of telephone number 911 by any person to obtain immediate response by the police, fire department, ambulance etc. to appropriate emergencies.

Los Alamos County

12-1-74
Date

Atomic Energy Commission
Los Alamos Area Office

11/20/74
Date

APR 1 4 1983

Robert K. Fisher, Chief
Los Alamos Police Department
P. O. Box 30
Los Alamos, NM 87544

Dear Mr. Fisher:

Statement of Policy and Agreement between the Los Alamos Area Office of the Department of Energy and Los Alamos County Relative to Traffic Control and Response by the Los Alamos Police Department (Reference: December 12, 1974, Agreement between LAAO/Los Alamos County, Attached)

Item III of the subject agreement states that "In the event of possible or suspected criminal violation of applicable state law or county ordinance not primarily of security interest (. . .) the Los Alamos Police Department is to be notified by the DOE/LAAO Protective Force Duty Officer. The Police Department will respond to and investigate only such incidents as required by state law or county ordinance."

The contracting-out of the Los Alamos Area Office, Federal, Protective Force, has created a situation where it is unclear as to which DOE or Laboratory management official is authorized to request the Los Alamos Police Department to respond to possible or suspected violations of applicable state laws or county ordinances.

An April 13, 1983 phone conference between Mr. Gary M. Granere, Acting Area Manager, and Mr. Donald M. Zerr, Director, Los Alamos National Laboratory, developed the following modification to the subject agreement designed to clarify which DOE or Laboratory management officials are authorized to request a response by the Los Alamos Police Department:

> Item III should read: "In the event of a possible or suspected criminal violation of applicable state law or county ordinance not primarily of security interest (. . .) the Los Alamos Police Department is to be notified by either the Chief, Security and Fire Protection Branch, LAAO, or the Associate Director for Technical Support, Los Alamos National Laboratory. The Police Department will respond to and investigate only such incidents as required by state law or county ordinance."

NOT DISPATCHED THRU
MAIL AND RECORDS

OFFICE ▶	S&FP	Counsel	Dep.Area Mgr			
SURNAME ▶	Peck/rj	MSechell	Granere			
DATE ▶	4/13/83	4/14/83	4/14/83			

Form ARC-[illegible] (Rev. 9-[illegible])

U.S. GOVERNMENT PRINTING OFFICE: [illegible]

All other aspects of the subject agreement remain unchanged. However, references to the AEC/LAAO Protective Force should be considered as references to the Mason and Hanager, Los Alamos Protective Force.

The current incumbents of the positions referred to above are:

Chief, Security and Fire Protection Branch, Los Alamos Area Office - Mr. Michael B. Peck, Telephone: 667-4228 (Office)
672-1248 (Home)

Associate Director for Technical Support, Los Alamos National Laboratory - Mr. Christopher S. Adams, Jr., Telephone: 667-9390 (Office)
672-1440 (Home)

We will be contacting you at a later date to discuss a formal revision of the subject agreement to update, clarify, add or delete as appropriate.

Sincerely,

Original Signed by
MICHAEL B. PECK

Michael B. Peck, Chief
Security & Fire Protection Br.

Enclosure

APPENDIX C

EMERGENCY EQUIPMENT

APPENDIX C

EMERGENCY EQUIPMENT

HAZMAT vehicles and trailers, stored at TA-59, are available for emergency response to all of the Technical Areas at Los Alamos National Laboratory. The HS-5 Group (665-4427) should be contacted whenever a HAZMAT vehicle is required. In addition, HS-5 is responsible for maintaining the supplies of appropriate emergency equipment in each vehicle or trailer.

The HAZMAT vehicles and trailers are equipped with safety and emergency equipment, personal protective clothing, and other supplies, which may include, but are not limited: assorted coveralls, T-shirts, and gloves, safety goggles and glasses, boots and booties, face shields, totally encapsulating suits and boots, Level A and B suits, flash suits, SCBAs and SCBA bottles, hazardous chemical reference books and other reference materials, shovels, siphon pumps, assorted spill kits and sorbents, chemical burn and neutralizing solutions, communication radios, bottles of leak detector, leak repair kits, emergency repair packs, HAZMAT bags, gas detectors, respirators and cartridges, sponges and cleaners, warning signs, traffic control barriers, flashlights, timers, cameras and film, knives, warning and signal horns, harnesses and belts, portable emergency oxygen, and assorted tools, tape, and other supplies.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-3

Emergency equipment at TA-3-29, available for mixed waste container storage areas in TA-3-29, Wing 9, Basement, Rooms 9010, 9020, and 9030:

FIRE CONTROL EQUIPMENT:

Three fire extinguishers

Locations:

1 CO_2 in Room 9008 (near Room 9010)
1 CO_2 in Room 9010
1 Halon in Room 9030

Description of General Capabilities:

These units have a 20-pound capacity and may be used by any employee in case of fire.

Three fire alarm pull boxes are located in Rooms 9008, 9010, and 9020.
Sprinkler systems are located in Rooms 9008, 9010, 9020, and 9030.
Automatic thermal alarm systems are located in Rooms 9008, 9010, and 9030.

Description of General Capabilities:

Manually-operated fire alarm may be activated by any employee in the event of fire to notify the Central Alarm Station (CAS). Automatic sprinkler system maximizes fire suppression in the event of a fire.

SPILL CONTROL EQUIPMENT:

Absorbent is kept in Room 9020. Rooms 9010 and 9020 each have three floor drains. Room 9020 has a sump, and Room 9030 has a total of about 10 sumps and drains. A sump is located in entryway/stairwell of Wing 9, Basement.

Description of General Capabilities:

Absorbent (Oilsorb) is used in the event of a small spill. The floor drain and sump are connected to the radioactive liquid waste line.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-3-29, Wing 9, Basement, continued:

COMMUNICATION EQUIPMENT:

Telephones (Centrex) are located in Room 9020.
Alarms:
Evacuation alarm is a pulsating sound over the PA System.
Fire alarm is a double slow whoop sound.
Description of General Capabilities:
Telephones are used for internal and external communication. Evacuation alarm is employed whenever an emergency situation requires evacuation of an area. Evacuation lights in Wing 9 are also activated when an evacuation is required. Fire alarm may be activated by any employee in case of fire to notify the CAS.

DECONTAMINATION EQUIPMENT:

Safety showers and eye washes are available in Room 9030.
Material Safety Data Sheets (MSDSs) are located outside of Room 9130.
Description of General Capabilities:
Safety showers and eye washes are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

Four self-contained breathing apparatus (SCBAs) are available in Room A.
Room 9102 is a change room with protective clothing.
Full-mask negative pressure respirators are located in hallway outside of Room 9104; radioactive particulate filters are available.

OTHER:

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-15

Emergency equipment available near TA-15-184 for HE mixed waste detonation site:

FIRE CONTROL EQUIPMENT:

Two vehicular mounted ABC fire extinguishers
Fire extinguisher located in control bunker
Four fire alarm pull boxes located inside Buildings 184, 186, 310, and 185

Description of General Capabilities:
The portable fire extinguishers are approximately 5 to 15 pounds in capacity. Fire alarms may be activated by any employee in the event of fire.

One fire hydrant at entrance to Building 186

COMMUNICATION EQUIPMENT:

Telephones (Centrex and private lines) are located at the control bunker and control building.

Description of General Capabilities:
Telephones are used for internal and external communication and have paging capabilities.

PERSONAL PROTECTIVE EQUIPMENT:

First aid kits and hearing protection gear are located in the control bunker.

OTHER:

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-16

Emergency equipment at TA-16-88, available for mixed waste container storage area:

FIRE CONTROL EQUIPMENT:

Three fire extinguishers

Locations:

1 Halon next to front door at northwest corner of TA-16-88

1 Metal-X next to front door at northwest corner of TA-16-88

1 graphite powder next to front door at northwest corner of TA-16-88

Description of General Capabilities:

These portable units have a 30-pound capacity and may be used by any employee in the event of fire. CO_2 and water fire extinguishers are located throughout TA-16.

One fire hydrant

Location:

Approximately 100 feet south of TA-16-88

SPILL CONTROL:

The floor of TA-16-88 has been sealed with epoxy paint to minimize contamination in the event of a spill.

COMMUNICATION EQUIPMENT:

Centron telephone system

Locations:

One Centron telephone is located inside near the front door at the northwest corner of TA-16-88.

1 Centron telephone is located outside near the front door at the northwest corner of TA-16-88.

Description of General Capabilities:

Telephones for internal and external communication are available for use by all employees.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency Equipment at TA-16-88, continued:

DECONTAMINATION EQUIPMENT:

One portable eye wash available
MSDSs available

Description of General Capabilities:
The eye wash is used by personnel who receive a chemical splash to the eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

Air-purifying respirators
First aid kits and hearing protection gear are located in the control bunker.

OTHER:

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-21

Emergency equipment at TA-21-61, available for mixed waste container storage areas:

FIRE CONTROL EQUIPMENT:

One ABC fire extinguisher located inside TA-21-61 in northwest corner by door.
One ABC fire extinguisher located inside TA-21-61 on east wall near back door.

Two fire alarm pull boxes are located on the outside walls of TA-21-61 (northwest corner and east walls).

An automatic overhead sprinkler system is located inside TA-21-61.

Description of General Capabilities:
Fire extinguishers may be used by any employee in case of fire. Manually-operated fire alarms may be activated by any employee in the event of fire. The automatic sprinkler system maximizes fire suppression in the event of fire.

One fire hydrant is located north of TA-21-61.

SPILL CONTROL EQUIPMENT:

A 6-inch curbing exists inside TA-21-61 and is capable of containing 3,646 gallons of liquid.

The storage area just east of TA-21-61 has an 8-inch high asphalt berm with a 11,354 gallon capacity. Additionally, a dirt berm exists along the east fence of this storage area.

COMMUNICATION EQUIPMENT:

Two telephones are located inside TA-21-61, 1 on north wall, 1 on east wall.

Description of General Capabilities:
Telephones are used for internal and external communication and are available for use by any employee.

DECONTAMINATION EQUIPMENT:

One safety shower and eye wash are located in the middle of TA-21-61.

Description of General Capabilities:
The safety shower and eye wash, both manually operated, are used by personnel who receive a chemical splash to the skin or eyes.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-21-61, continued:

OTHER:

A one-ton forklift is available on-site.

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-36

Emergency equipment at TA-36-8, available for HE mixed waste detonation site (MINIE):

FIRE CONTROL EQUIPMENT:

Four fire extinguishers

Locations:

1 45-pound capacity CO_2 fire extinguisher in control bunker

1 2.5-gallon capacity water fire extinguisher in control bunker

2 45-pound capacity Halon fire extinguishers: one in each vehicle used to transport HE material

Description of General Capabilities:

These are portable units for use by any M-8 employee in case of a fire.

The water fire extinguisher is for use on wood or brush fires. The CO_2 fire extinguisher is for use on electrical fires in the control bunker. The Halon fire extinguishers are for use in the event of an uncontrolled fire on the firing mound.

A fire alarm pull box is located inside the main chamber of the control bunker (TA-36-8), northwest corner.

Description of General Capabilities:

Manually-operated fire alarms may be activated by any employee.

An automatic thermal alarm system is located in the control bunker.

Two alarms are connected to this system. One is located on the ceiling of the main chamber and one is located on the ceiling of the camera room.

COMMUNICATION EQUIPMENT:

Telephones and two-way radios:

3 telephones located inside control bunker

1 telephone located at the firing mound

1 two-way radio located in make up building (TA-36-7)

1 two-way radio located inside control bunker

1 two-way radio issued to each vehicle in the firing site fleet

Description of General Capabilities:

Telephones for internal and external communication are available for use by any employee.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-36-8, continued:

DECONTAMINATION EQUIPMENT:

Eye wash station and MSDSs available in main chamber of control bunker

Description of General Capabilities:

The eye wash is used by personnel who receive a chemical splash to the eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

One SCBA is located in the control bunker. First aid kits, hearing protection gear, and respirators are located in TA-36-8.

OTHER:

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-50

Emergency equipment at TA-50-1, Rooms 60A and 60D, available for mixed waste container storage area and cementing process:

FIRE CONTROL EQUIPMENT:

A Halon 1211-ABC fire extinguisher is located on the south wall of Room 60D.
A fire alarm pull box is located 30 yards south of Room 60D in Room 72.
Automatic sprinkler systems are located in Rooms 60A and 60D.

Description of General Capabilities:
The Halon fire extinguisher may be used by any employee in case of fire. Manually-operated fire alarm may be activated by any employee in the event of fire to notify the CAS. Automatic sprinkler systems maximize fire suppression in the event of a fire.

A fire hydrant is located approximately 25 yards north of Room 60D.

SPILL CONTROL EQUIPMENT:

Room 60A has a 6-inch berm. Universal sorbents, spill pillows, and neutralizer are stored in Room 60D. The absorbents are designed for use with solvents, acids, caustics, and oils.

Copies of the Emergency Plan for TA-50-1 are kept in Rooms 60 and 108 at TA-50-1.

COMMUNICATION EQUIPMENT:

Two telephones located in Rooms 60 and 60A are connected to the building-wide paging system.
One two-way radio is located in Room 60.
Alarms:
2 high level alarms are installed in Tanks 6 and 7.
A fire alarm located on the south wall of Room 60 emits a double slow whoop sound.

Description of General Capabilities:
Telephones are used by any employee for internal and external communication. The two-way radio in Room 60 allows for communication between personnel in Rooms 16 and 60. The fire alarm is also used as an evacuation alarm. When this alarm is activated, a flashing red light will be observed by personnel in the area.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-50-1, Rooms 60A and 60D, continued:

DECONTAMINATION EQUIPMENT:

One safety shower and eye wash is located in the northeast corner of Room 60A.
One hand held eye wash is located on the south wall of Room 60D.

Description of General Capabilities:
The safety shower and eye washes are used by personnel who receive a chemical splash to the skin or eyes.

A decontamination bay is located in Room 34B.

PERSONAL PROTECTIVE EQUIPMENT:

Two Model 401 SCBAs are located in Room 70.

Room 110 is a change room with protective clothing.

OTHER:

Emergency electrical generators are available from TA-50-54 and TA-3-1264.

A 1983 Ford 4X4 with 2 SCBAs and a 1988 Dodge pickup, located at TA-50-1, are available for evacuation of personnel.

One three-ton fork lift is located in Room 60D.

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-50

Emergency equipment at TA-50-37, available for the Controlled Air Incinerator and associated container storage areas and tank storage:

FIRE CONTROL EQUIPMENT:

Twelve fire extinguishers (3 CO_2, 9 Halon)

Locations:
1 Halon in Room 111
1 Halon, 2 CO_2 in Room 112
2 Halon in Room 114
1 Halon at front main doorway
1 CO_2 in Room 106
1 Halon in Room 209
1 Halon in Room 202
1 Halon in Room 21
1 Halon in Room 116

Description of General Capabilities:
These portable units are from 5.5 to 44 pounds in capacity and may be used by any employee in the event of fire.

Fourteen fire alarm pull boxes

Locations:
1 in Room 111
2 in Room 112
1 south of the library and conference room
2 in Room 114
1 east of the women's change room
1 in the break room
1 in Room 202
2 in Room 21
1 in Room 15
1 in Room 116
1 in the access hallway, Room 113

Description of General Capabilities:
Manually-operated fire alarms may be activated by any employee in the event of fire to notify the CAS.

An automatic water sprinkler system is located throughout TA-50-37. Room 115 has an additional Halon system. Rooms 117 and 118 have a supplementary external foam additive system to maximize fire suppression.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-50-37, continued:

Description of General Capabilities:
The automatic sprinkler system delivers a maximum of 200 psi of water spray through sprinkler heads placed at locations which will maximize fire suppression.

FIRE CONTROL EQUIPMENT, continued:

Halon extinguishing systems supplement the automatic sprinkler system and are used to protect high value equipment or in areas of special operations.

An automatic thermal alarm system is located throughout TA-50-37.

Four fire hydrants
Locations:
1 northwest corner of TA-50-94, west of TA-50-37
1 west of TA-50-69
1 northeast of TA-50-37
1 southeast of TA-50-37

Thirteen freeze-proof faucets
Locations:
2 hot water and 2 cold water faucets located in Room 116
1 faucet located in Room 114
8 faucets in various outdoor locations surrounding TA-50-37

SPILL CONTROL EQUIPMENT:

Room 115 is curbed and has a capacity of 562 gallons. Room 117 has a recessed floor with a capacity of approximately 23,700 gallons. Room 118 is equipped with a 200 gallon capacity sump. Overflows from Room 118 are contained in the recessed floor in Room 117 or may be handled by a sump in Room 117. Absorbent is kept in Room 114. Absorbent includes 75 2-foot spill pillows and 500 18" X 36" absorbent sheets. The Spill Prevention, Control, and Containment Plan is located in the safety document bookcase in TA-50-37.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-50-37, continued:

COMMUNICATION EQUIPMENT:

Thirty-one telephones and a building-wide paging system are located throughout TA-50-37, -94, and -54.
One two-way radio is assigned to truck #38438.
Alarms:
Fire alarm emits a double slow whoop sound.
Evacuation alarm is a continuous single-tone alarm.
Description of General Capabilities:
Telephones are available to any employee for use in internal and external communication. Fire alarm may be activated by any employee in case of fire to notify the CAS. Evacuation alarm is activated whenever a situation requires evacuation of the area.

DECONTAMINATION EQUIPMENT:

Six safety showers and six eye washes are located in or around TA-50-37.
MSDS information specific to chemicals on hand is located in each laboratory and shop.
Description of General Capabilities:
Safety showers and eye washes are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

Decontamination area in egress bay (Room 116) allows for a wash down of contaminated equipment.

PERSONAL PROTECTIVE EQUIPMENT:

Two SCBA are located in Room 103.

Room 103 is a change room with protective clothing available.

OTHER:

Portable emergency generator (5,000 watt) is located at TA-50-54.
Vehicle available for evacuation of personnel is located on-site.
Two forklifts (1 electric, 1 propane) are located in Room 114.
See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-50

Emergency equipment at TA-50-69, available for mixed waste container storage areas at the Size Reduction Facility:

FIRE CONTROL EQUIPMENT:

Five fire extinguishers

Locations:

2 B-CO_2 extinguishers inside TA-50-69; 1 near airlock entrance, 1 in north corner.
3 C-Halon extinguishers inside TA-50-69; 1 near airlock entrance, 1 in north corner, and 1 on mezzanine level.

Description of General Capabilities:

These portable, manually-operated units are available for use by technicians and/or firefighters. One Halon extinguisher has a 19-pound capacity; all others have a 45-pound capacity.

Two fire alarm pull boxes are located inside TA-50-69; 1 near the main entrance and 1 in the west corner near the back entrance.
A sprinkler system with 34 heads is located throughout TA-50-69.
An automatic thermal alarm system is located in the glovebox in TA-50-69.

Description of General Capabilities:

Fire alarms may be activated by any employee in case of fire to notify the CAS. The automatic sprinkler system is set off at 212 degrees Fahrenheit and maximizes fire suppression. The automatic thermal alarm system is set off at 190 degrees Fahrenheit and automatically activates the fire alarm panel which then transmits a signal to the CAS.

One fire hydrant is located approximately 50 feet west of TA-50-69.

Two freeze-proof faucets are located on the northwest and northeast sides of TA-50-69.

COMMUNICATION EQUIPMENT:

Two telephones with paging and PA system are located inside TA-50-69; 1 near the main entrance and 1 in the west corner near the back entrance.
One two-way radio is issued to a vehicle stationed outside of TA-50-69.
The fire alarm, a slow whoop sound, is also used as an evacuation alarm.

Description of General Capabilities:

Telephones are available for use by any employee for internal and external communication. The evacuation (fire) alarm is activated whenever a situation requires evacuation of the area.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-50-69, continued:

DECONTAMINATION EQUIPMENT:

One safety shower/eye wash is located northwest of glovebox in TA-50-69.
MSDSs are available near the safety shower/eye wash.

Description of General Capabilities:
The safety shower and eye wash are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

Two self-contained portable air masks are available in TA-50-84-107.

A change room with protective clothing available is located inside the northwest corner of TA-50-69.

Eight respirators are located inside the northwest corner of TA-50-69.

OTHER:

One portable emergency generator is located in TA-50-125 (shed) just outside the airlock entrance of TA-50-69.

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-50

Emergency equipment at TA-50-114, modular shed for mixed waste container storage:

FIRE CONTROL EQUIPMENT:

One fire extinguishing system is located inside TA-50-114. This system is a 50-pound Foray dry chemical/nitrogen system with two discharge heads.
Two pull boxes, located inside and outside the northwest corner of TA-50-114, may be used to activate the fire suppression system.
One fire hydrant is located approximately 60 feet west of TA-50-114.

SPILL CONTROL EQUIPMENT:

The floor of TA-50-114 is bermed into two separate compartments which are capable of containing up to 2,200 gallons of stored liquids. A sub-floor containment system is built into the structure.

Approximately 30 spill pillows are located at the west end of TA-50-114. These absorbent pillows are compatible with solvents, acids, oils, and caustics.

A copy of the Emergency Plan for TA-50-1 is located in the Section Office in TA-50-1.

COMMUNICATION EQUIPMENT:

Three telephones are located in nearby TA-50-1, Rooms 60C, 60D, and 34B. These telephones are connected to the paging system.

Two-way radios are issued to individuals and vehicles (see TA-50-1 Emergency Equipment list, 11-90, and EM-7 Vehicle Inventory List, 2-25-91).

The fire alarm system can be used as an evacuation alarm. Additionally, the paging system, installed on all telephones, may be used to announce evacuation.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-50-114, continued

DECONTAMINATION EQUIPMENT:

A safety shower is located on the upper level of TA-50-2, south end.
An emergency eye wash and MSDSs are located in Room 16 of TA-50-1.

Description of General Capabilities:
The safety shower and eye wash are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

A decontamination bay is located in Room 34B of TA-50-1.

PERSONAL PROTECTION EQUIPMENT:

Room 110 in TA-50-1 is a change room with protective clothing available.

Respirators are located in Room 115, TA-50-1.

OTHER:

Portable emergency generators are available from TA-50-54 and TA-3-1264.

A 1983 Ford 4X4 with 2 30-minute SCBAs and a 1988 Dodge pickup are located at TA-50-1 for evacuation of personnel.

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-54

Emergency equipment at TA-54, Area G:

FIRE CONTROL EQUIPMENT:

Seven fire extinguishers (5 10-pound Halon, 2 5-pound chemical BC) are located in TA-54-49.
An automatic thermal alarm system is located in TA-54-49.

Description of General Capabilities:
Fire extinguishers may be used by any employee in the event of a small fire. If the ceiling mounted thermal alarm system sensors are activated, the Pro Force and Fire Department are alerted.

One fire hydrant located near TA-54-156

SPILL CONTROL EQUIPMENT:

A 6-inch asphalt curb surrounds the interior of TA-54-49 and is sufficient for capacity of any spill. Absorbent spill pillows and pads are stored at the emergency spill station inside each dome. Vermiculite and corn cob fractions are also available in TA-54-79 and at the emergency spill station in each dome.

One portable spill station contains:
- 2 plastic suits
- 2 pair goggles
- 2 pair rubber gloves
- sorbent pads and pillows
- plastic bags

COMMUNICATION EQUIPMENT:

A private telephone is located at the front (north side) of TA-54-49.
Telephones with speakers are located in TA-54-2, -11, -22, and -33.
Eight portable two-way radios are issued to technicians and to the secretary at TA-54-22.
Two base unit radios are located in TA-54-22.
Pagers are carried by all technicians; pagers are accessed by telephone.
Two two-way radios are issued to vehicles assigned to Area G.

Description of General Capabilities:
Telephones and alarms are located throughout Area G. The evacuation alarm is a high-pitched wailing sound which can be heard throughout Area G. Strobe lights mounted on poles throughout the area may be used to visually alert personnel to evacuate the area. A video explaining alarms and evacuation procedures must be viewed prior to entering the site.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-54, Area G, continued:

DECONTAMINATION EQUIPMENT:

Portable eye wash stations are available at TA-54-49.
One safety shower is located at TA-54-11.
MSDSs are available at TA-54-22.

Description of General Capabilities:
The safety shower and eye washes are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

A change room is located at TA-54-11; protective clothing is available in TA-54-2.

Six air-purifying respirators are available at TA-54-156.

Additional respirators are available in the Area G emergency equipment trailer.

OTHER:

Heavy equipment kept on site includes:
- 2 scrapers
- 1 bulldozer
- 1 front-end loader
- 1 dump truck
- 1 flat-bed truck

Four portable emergency generators are available on site: 3 are located by TA-54-48; the other is in the Area G emergency equipment trailer.

Fourteen vehicles available in Area G to evacuate personnel include:
- 2 Honda all-terrain vehicles (ATVs)
- 2 Polaris ATVs
- 2 pickup trucks
- 1 dump truck
- 1 flatbed truck
- 7 golf carts

The Area G emergency equipment trailer may be pulled by several different vehicles and is equipped to respond as a first response vehicle.

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-54

Emergency equipment at TA-54, Area L:

FIRE CONTROL EQUIPMENT:

Nine fire extinguishers (Halon, water, CO_2)

Locations:

1 Halon (ABC) inside TA-54-37
1 water (A) inside TA-54-60
1 water (A) inside TA-54-51
1 Halon (ABC) inside northeast end of TA-54-32
1 extinguisher (BC) inside TA-54-39
1 extinguisher (BC) along fence at southeast end of Area L
1 CO_2 (BC) located outside of TA-54-31
1 extinguisher located 30 feet from southeast side of TA-54-32
1 water (A) located outside of TA-54-117

Description of General Capabilities:

These fire extinguishers may be used by any employee in case of a small fire.

Fire alarm pull boxes are located inside TA-54-37, -51, -60, and -117.

Description of General Capabilities:

Fire alarms may be activated by any employee in the event of a fire to notify the CAS.

One fire hydrant is located 30 feet south of entrance to site.

One freeze-proof faucet is located approximately 25 feet east of TA-54-31.

SPILL CONTROL EQUIPMENT:

Shovels located in TA-54-46
Oversized drums
Sawdust absorbent located on site

Spill kits are located throughout Area L. Each kit includes a 50-pound bag of Zorball, 90 pounds of caustic neutralizer, 100 pounds of acid neutralizer, and an inventory of tools and supplies.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-54, Area L, continued:

COMMUNICATION EQUIPMENT:

Four 2-way radios are available to personnel while in Area L.
Three 2-way radios are issued to vehicles used in Area L activities.
Three outdoor telephones, connected to the PA system, are located in Area L.
Telephones are located inside TA-54-37, -39, -51, and -60.
Fire alarm is a double slow whoop sound.
An emergency evacuation paging system is located in TA-54-37 and at the north end of TA-54-32.
Evacuation alarm is a pulsating sound.
The PA system can be operated from any phone in Area L.

Description of General Capabilities:
Telephones for internal, external, and PA capabilities are available for use by any employee. Fire and evacuation alarms are activated in the event of a fire or in case an evacuation is required.

DECONTAMINATION EQUIPMENT:

One emergency shower and eye wash are located immediately east of TA-54-31.
One emergency shower and eye wash are located between TA-54-35 and -36.
One emergency shower and eye wash are located in TA-54-39.
One portable eye wash is located in TA-54-52.
MSDSs are available in TA-54-55.

Description of General Capabilities:
Safety showers and eye washes are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

Two SCBAs are located in TA-54-52.

Air purifying respirators are available in TA-54-52.

OTHER:

A portable emergency generator is located in TA-54-46.
A forklift and Bobcat are available in Area L.
Heavy equipment from Area G is available for emergencies at Area L.
See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-55

Emergency equipment at TA-55-4 (First Floor), available for mixed waste container storage area, storage tanks, and cementing process in Room 401, and oxygen sparging furnace in Room 429:

FIRE CONTROL EQUIPMENT:

Seven fire extinguishers

Locations:

3 17-pound Halon in Room 401
2 15-pound Metal-X in Room 429
1 20-pound BC (CO_2) in Room 429
1 17-pound Halon in Room 429

Description of General Capabilities:

The fire extinguishers in Rooms 401 and 429 are for use only in case of fire outside of the gloveboxes which house the cementation process and the oxygen sparging furnace. The fire extinguishers are portable, manually-operated units. They may be used by any employee in case of fire. MgO sand is available in Room 429 for use inside the glovebox in case of fire.

Fire alarm systems

Locations:

1 pull box outside of Room 401
1 pull box outside of Room 429
5 dropbox alarm pushbutton stations in Room 401
3 dropbox alarm pushbutton stations in Room 429

Description of General Capabilities:

Fire alarms may be activated by any employee in the event of fire to notify the CAS.

An automatic fire suppression sprinkler system is located in Rooms 401 and 429.

Automatic thermal alarms are located in the gloveboxes in Rooms 401 and 429.

Fire hoses located in the hallway outside Room 401 and Room 429 are connected to a water source located outside of TA-55-4.

Seven fire hydrants are located outdoors on the north, south, and west sides of TA-55-4.

SPILL CONTROL EQUIPMENT:

Storage rooms on the first floor (including Rooms 401 and 429) have recessed floors. There is curbing between the rooms which will contain any spills which may occur in either room.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-55-4 (First Floor, Rooms 401 and 429), continued:

SPILL CONTROL EQUIPMENT, continued:

A mobile spill cart is located in the basement of TA-55-4. This spill cart may be transported to any spill location when the need arises. The spill cart contains the following items:

2 boxes of latex gloves, 4 rolls of masking tape, 6 rolls of yellow vinyl tape, 2 rolls of yellow caution tape (1 acid, 1 caustic), 1 box of polyethylene booties, 4 boxes of shoulder-length polyethylene gloves, 2 boxes of yellow latex gloves, 1 wrench, 30 yellow protective suits (assorted sizes), 2 rolls of cheesecloth, 33 pair of chemical protective goggles, 92 spill pillows, 3 bottles of neutra acid and spray triggers, 1 bottle of base neutralizer, 3 canisters for MSA canister gas masks, 8 pair of neoprene gloves, a vinyl bag, and 3 bottles of neutra base and spray triggers.

Spill pillows may be used to construct simple berms.

COMMUNICATION EQUIPMENT:

Three telephones are located in or near Room 401. These telephones are capable of handling incoming and outgoing calls and paging within the 400 area.

Two telephones are located in Room 429. They are capable of handling incoming and outgoing calls and may be used for paging in the 400 area.

One telephone is located at each of the west exit doors of TA-55-4 (2 total).

Two-way radios are available, as needed, from NMT-8 at the TA-55-3 Operations Center for personnel working in Rooms 401 and 429.

Alarms at TA-55-4:

Fire alarm is an area-wide whooping sound. If a dropbox pushbutton station is used, a local, high-pitched constant tone will also be activated.
Evacuation alarm is a facility-wide warbled tone.
Continuous Air Monitor (CAM) alarm is a local short, fast, pulsing high-pitched tone.
Ventilation alarm is a local slow, repeating high-pitched tone.
The PA system may also be used to announce an evacuation.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-55-4, (First Floor, Rooms 401 and 429), continued:

DECONTAMINATION EQUIPMENT:

Two safety showers are located in Room 401.
Two safety showers are located in Room 429.
Three eye washes are located in Room 401.
One eye wash is located in Room 429.
MSDSs for each chemical handled are available in Rooms 401 and 429.

Description of General Capabilities:
Safety showers and eye washes are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

Four SCBAs are located in the hallway outside of Rooms 401 and 429. Three SCBAs are located in the northside hallway in TA-55-4. They are available for personnel working in or near Rooms 401 and 429.

Additional SCBA are available in Room 124 (Auditorium) in TA-55-1.

Change rooms with protective clothing available are located on the first floor of TA-55-4 (Rooms 132 and 133) and in TA-55-3 (Rooms 107 and 140). Protective clothing is also available in the HS-10 locker located in the hallway near Room 401 for use by personnel working in or near Rooms 401 and 429.

More than 100 respirators are located in TA-55-3 (Room 107) and in TA-55-4 (Room 515) for all personnel working in or near TA-55-4. Particulate and toxic gas canisters are available in TA-55-4 (Room 515).

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-55-4, (First Floor, Rooms 401 and 429), continued:

OTHER:

The HS-10 locker located in the hallway near Room 401 contains the following items: Acid suits, hoods, sleeves, Ludlum cables, model 214 cables, paper cover-alls, probes, Nu-con smears, Nu-con smear holders, canister gas mask (type GMHF-C), radiation tags, labels, radioactive contamination tape, shurtape (silver), earphones, fixed head filters (holders), and chemical spill pillows. These items are available for personnel working in or near Rooms 401 and 429.

More than 7 vehicles are available through the NMT-8 Support Office for evacuation of personnel.

Two portable emergency generators (110 V) are available from the NMT-8 Support Office at TA-55-3.

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-55

Emergency equipment at TA-55-4 (Basement), available for the following mixed waste container storage areas: 3 TRU mixed waste storage areas, 1 oversized TRU mixed waste storage area, 1 low-level mixed waste storage area, and container storage area located in the vault.

FIRE CONTROL EQUIPMENT:

Nine fire extinguishers

Locations:

5 15-pound CO_2 in basement; 1 north of Area 1, 1 west of the vault south entrance, 1 west of the low-level mixed waste storage area, 1 west of Area 1 in Room 46, 1 south of the vault in Room 38

1 13.5-pound Halon east of Area 1

1 13-pound Halon fire extinguisher in vault

1 water (2-1/2 gallon) immediately outside vault north entrance

1 10-pound ABC fire extinguisher in vault

Description of General Capabilities:

The fire extinguishers are portable, manually-operated units. They may be used by any employee in case of fire.

Fourteen fire alarm pull boxes

Locations:

1 pull box located on each side of the fire doors (total 4)

1 pull box located north of the vault

2 pull boxes located west of Area 2

1 pull box located north of the oversized mixed waste storage area

1 pull box located west of the oversized mixed waste storage area

1 pull box in stairwell east of low-level mixed waste storage area

1 pull box in stairwell east of Area 3

2 pull boxes in basement vault corridor

1 pullbox in basement vault office

Description of General Capabilities:

Fire alarms may be activated by any employee in the event of fire to notify the CAS.

An automatic fire suppression sprinkler system is located throughout the basement at TA-55-4, including the vault rooms, vault office, and vault corridor.

Thirteen fire hoses located throughout the basement are connected to a water source located outside of TA-55-4.

Seven fire hydrants are located outdoors on the north, south, and west sides of TA-55- 4.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-55-4 (Basement storage areas), continued:

SPILL CONTROL EQUIPMENT:

A mobile spill cart is located in the basement of TA-55-4. This spill cart may be transported to any spill location when the need arises. The spill cart contains the following items:

2 boxes of latex gloves, 4 rolls of masking tape, 6 rolls of yellow vinyl tape, 2 rolls of yellow caution tape (1 acid, 1 caustic), 1 box of polyethylene booties, 4 boxes of shoulder-length polyethylene gloves, 2 boxes of yellow latex gloves, 1 wrench, 30 yellow protective suits (assorted sizes), 2 rolls of cheesecloth, 33 pair of chemical protective goggles, 92 spill pillows, 3 bottles of neutra acid and spray triggers, 1 bottle of base neutralizer, 3 canisters for MSA canister gas masks, 8 pair of neoprene gloves, a vinyl bag, and 3 bottles of neutra base and spray triggers.

The basement vault has a recessed floor, which allows for containment of spilled material.

COMMUNICATION EQUIPMENT:

Eight telephones and seven intercom stations are located throughout the basement of TA-55-4. The telephones are capable of handling both incoming and outgoing calls. The intercom system is connected to the TA-55-3 Operations Center and allows the Operations Center to easily mobilize emergency response support.

QFour two-way radios are available from NMT-8 at the TA-55-3 Operations Center for personnel working in the basement at TA-55-4.

Personal pagers are issued to and carried by assigned personnel working in the basement of TA-55-4. These pagers are accessed by telephone.

Alarms at TA-55-4:

Fire alarm is an area-wide whooping sound. If a drop box pushbutton station is used, a local high-pitched constant tone will also be activated.
Evacuation alarm is a facility-wide warbled tone.
The CAM alarm is a local short, fast, pulsing high-pitched tone.
Ventilation alarm is a local slow, repeating high-pitched tone.
The PA system activated from the TA-55-3 Operations Center may be used to announce an evacuation.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-55-4 (Basement storage areas), continued:

COMMUNICATION EQUIPMENT, continued:

There is a site-wide paging system activated from the TA-55-3 Operations Center that can be heard throughout TA-55-4.

DECONTAMINATION EQUIPMENT:

Fourteen eye washes are located throughout the basement of TA-55-4; two eye washes are located just outside of the vault area.
One safety shower is located in the vault office area.
MSDSs are available in the NMT-2 Group office at TA-55-2.
Description of General Capabilities:
The safety shower and eye washes are used by personnel who receive a chemical splash to the skin or eyes.

Two mobile decontamination carts are located north of Area 2 in the basement. The decontamination cart contains the following items:

10 rolls yellow tape, 1 bundle of paper hoods and paper coveralls, 10 rolls 2" masking tape, 10 rolls 1" masking tape, soap, 5 bottles Fantastic, 1 dozen china markers, rubber gloves (sizes 8,9,10), 1 box knives, miscellaneous tools, 2 scissors, 1 dozen towels, 1 box nose swabs, two 25' extension cords, 1 roll yellow and magenta radiation tape, high top yellow booties, blue and white booties, several sizes of plastic bags, 2 X 2 Glassine envelopes, 10 bundles cheesecloth, 5 clip boards, pencils and paper, 1 roll 2'-wide paper, 1 dozen work gloves, mop and bucket (2 each), 1 roll red plastic.

PERSONAL PROTECTIVE EQUIPMENT:

Two SCBA are located in the basement. One is located north of the vault. One is located east of Area 1.
Additional SCBA are available in TA-55-1, Room 124 (Auditorium) and on the first floor of TA-55-4.
Change rooms with protective clothing available are located on the first floor of TA-55-4 (Rooms 132 and 133) and in TA-55-3 (Rooms 107 and 140).

More than 100 respirators are located in TA-55-4 (Room 515) and in TA-55-3 (Room 107) for all personnel working in or near TA-55-4. Particulate and toxic gas canisters are available in TA-55-4 (Room 515).

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-55-4 (Basement storage areas), continued:

OTHER:

More than 7 vehicles are available through the NMT-8 Support Office for evacuation of personnel.

Portable emergency generators (110 V) are available from the NMT-8 Support Office at TA-55-3.

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

TA-55

Emergency equipment at TA-55-4, available for container storage pad located west of TA-55-4:

FIRE CONTROL EQUIPMENT:

Thirteen fire extinguishers:

Locations:

1 15-pound CO_2 fire extinguisher located on Dock S-4 outside the south side of TA-55-4

8 13-pound Halon located in TA-55-42 at the northwest corner of TA-55-4

3 15-pound CO_2 located in TA-55-42 at the northwest corner of TA-55-4

1 10-pound ABC located in TA-55-42 at the northwest corner of TA-55-4

Description of General Capabilities:

The fire extinguishers are portable, manually-operated units. They may be used by any employee in case of fire.

Seven fire hydrants are located along the north, south, and east sides of TA-55-4.

Five fire alarm pull boxes are located in TA-55-42 at the northwest corner of TA-55-4.

One fire alarm pull box is located outside on the south side of TA-55-4.

COMMUNICATION EQUIPMENT:

Two Centrex telephones are located at the west exit doors of TA-55-4.

Description of General Capabilities:

Telephones are used for internal and external communication.

Two-way radios are available from NMT-8 at the TA-55-3 Operations Center for personnel working at the container storage pad west of TA-55-4.

Personal pagers are issued to and carried by assigned personnel working in the container storage pad west of TA-55-4. These pagers are accessed by telephone.

Alarms at TA-55-4:

Fire alarm is an area-wide whooping sound.

Evacuation alarm is a facility-wide warbled tone.

The CAM alarm is a local, short, fast, pulsing high-pitched tone.

Ventilation alarm is a local slow, repeating high-pitched tone.

The PA system activated from the TA-55-3 Operations Center may be used to announce an evacuation.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at TA-55-4, (container storage pad), continued:

COMMUNICATION EQUIPMENT, continued:

PA speakers are located on the west side of TA-55-4. Two intercom systems to the TA-55-3 Operations Center are located on the south and north sides of TA-55-4. Operations Center personnel will contact emergency response organizations.

DECONTAMINATION EQUIPMENT:

Two safety showers are located outdoors on the south side of TA-55-4.
Two eye washes are located outdoors on the south side of TA-55-4.
MSDSs are available in the NMT-2 Group office at TA-55-2.

Description of General Capabilities:
The safety showers and eye washes are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

SCBAs are available in TA-55-1, Room 124 (Auditorium).

Change rooms with protective clothing available are located on the first floor of TA-55-4 (Rooms 132 and 133) and in TA-55-3 (Rooms 107 and 140).

More than 100 respirators are located in TA-55-4 (Room 515) and in TA-55-3 (Room 107) for all personnel working in or near TA-55-4.

OTHER:

A four-wheel drive front-end loader is available from NMT-8 in TA-55-3.

More than 7 vehicles are available through the NMT-8 Support Office for evacuation of personnel.

Portable emergency generators (110 V) are available from the NMT-8 Support Office at TA-55-3.

See page 1 of this Appendix for HAZMAT equipment available.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Supplemental emergency equipment available from the Los Alamos Fire Department:

	Number
1,000 gallons per minute pumper truck	1
1,250 gallons per minute pumper trucks	7
Minipumper trucks	4
3,000-gallon tankers	2
2,000-gallon tankers	2
1,500-gallon tanker	1
Modular ambulances	4
Rescue vehicles	2
Crash-Fire-Rescue (CFR) units	2
SCBA	70
105-foot ladder truck	1
Personnel with 81 hours MTA training	110
Various firefighting equipment	

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Supplementary emergency equipment available from Johnson Controls World Services Inc.:

	Number
TRANSPORTATION	
Pickups, 1/2 through 3/4 ton	183
Trucks, 1 through 3 ton	25
Powerwagon (E-20781) with welder (PN-30256) mounted on vehicle, CC-135	1
Buses (11-passenger)	2
Station wagons	2
Vans, panels, and carryalls	24
SPECIAL EQUIPMENT	
Road grader, Cat, self-propelled blade, with radio	1
Grader, John Deere, self-propelled, with radio	1
Loaders, bucket, Melroe, Bobcat, 1/3 cubic yards	3
Loader, bucket, Cat, 2-3/4 cubic yards, with radio	1
Loader, Fiat-Allis, 3 cubic yards	1
Loader, bucket, Cat, 2-1/2 cubic yards	1
Loader, bucket, Cat, 3-1/4 cubic yards	1
Loader, bucket, Yale, 3 cubic yards, with radio	1
Loader, bucket, backhoe, Case, 1-1/2 cubic yards	1
Loaders, bucket, backhoe, Case, 7/8 cubic yards	2
Loader, backhoe, Ford, 1 cubic yard	1
Snowplows, Bombardier, with blade	2
Bulldozer, D-8, Crawler	1
Bulldozers, TD-25, International	2
Scraper, Terex, self-propelled	1
Scraper, Fiat-Allis, self-propelled	1
Bulldozer, 280, rubber-tired, with radio	1
Semitrailers	5
Power saws	(approx) 6
Flusher, street, 3,000-gallon truck, tanker, 500-gallon, FMC	1
Mobile transceivers (2-way, KOB-753)	20

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Supplementary emergency equipment available from Johnson Controls World Services Inc., continued:

	Number
SPECIAL EQUIPMENT (CONT.)	
Handsets (2-way)	64
Pageboys (1-way)	235
Welders, mounted on trailers and trucks	32
PERSONNEL	
Bulldozer operators	14
Clerks	10
Dispatchers	1
Mechanics	17
Power saw operators	8
Radio and telephone operators	1
Truck drivers	13

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at the Medical Facility, HS-2

At SM-409 Central Clinic:

PERSONNEL:	Number
Physicians (2 casual)	7
Physician's Assistants (2 casual)	5
Nurses (6 casual)	12
X-ray Technicians (1 casual)	2
Clinical Laboratory Technicians (4 part-time)	5

SPECIAL EQUIPMENT-PORTABLE:	
Receivers - Med Net, Fire Net, Hickory Net, Emergency HS-Div.	4
Walkie talkies (HS Division NET)	4
Cardiac monitors and defibrillators (1 backup)	2
Crash cart-emergency equipment with E-tank O_2	1
Portable physicians bag-drugs	1
Portable suction unit	1
Portable, 1 ambulance, 3 gurney stretchers	2
Wheel chairs	3
O_2 tanks	3
Manual resuscitators	2
IV stands	2
IV solutions	q.s.*
Otoscope/ophthalmoscopes	4
Portable sphygmomanometers	6
Stethoscopes	20
Anti-c apparel	q.s.
Eye irritation solution	q.s.
Full set air splints	1
Industrial first-aid kits	1
Extrication and cervical collars, crutches, canes	q.s.
Suture sets	4

*q.s. - inventory varies as needed.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at the Medical Facility, HS-2, continued:

SUPPLIES-GENERAL:

Bedding/Pillows
Rescue blankets
Burn blankets
Thermal/icing pouches
Multitrauma dressings, surgical and first aid supplies

SPECIAL FACILITIES - NONPORTABLE:

Completely equipped emergency room with ambulance entrance
Emergency lighting system
Complete X-ray suite
Contamination showers, protective clothing, and wound counters
12-lead electrocardiograph
Fully equipped crash cart with Life Pak, intubation equipment, emergency drugs, etc.
Fully equipped decontamination room at Los Alamos Medical Center adjacent to LAMC Emergency Room

TRANSPORTATION:

Full ambulance service is available within minutes to the central facility and all satellite clinics.
1980 Dodge Van

COMMUNICATION:

Base station on State Medical Net

At TA-53 Satellite Station:

PERSONNEL:

Physician's Assistant (part-time)	1
Nurse (half-time)	1

*q.s. - inventory varies as needed.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at the Medical Facility, HS-2, continued:

At TA-53 Satellite Station (continued):

SPECIAL EQUIPMENT - PORTABLE:

Beeper	1
Stretcher	1
Wheelchair	1
O_2 Tank	1
IV solutions	q.s.
Otoscope/ophthalmoscopes	2
Sphygmomanometer	1
Stethoscopes	2
Anti-c apparel	q.s.
Eye irrigation solution	q.s.
Industrial first-aid kit	1
Extrication and cervical collars	1
Crutches	1
Cane	1
Suture set	1

SUPPLIES:

Ample first aid supplies

At S-Site Satellite Station:

PERSONNEL:

Physician's Assistant (part-time)	1
Nurse (half-time)	1

*q.s - inventory varies as needed

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at the Medical Facility, HS-2, continued:

SPECIAL EQUIPMENT - PORTABLE:

Stretcher	1
Wheelchair	1
O_2 Tank	1
IV solutions	q.s.
Otoscope/ophthalmoscopes	1
Sphygmomanometer	2
Industrial first-aid kit	1
Extrication and cervical collars	1
Crutches	1
Cane	1
Suture set	1

SUPPLIES:

Ample first aid supplies

At TA-55 Satellite Station:

PERSONNEL:

Physician (part-time)	1
Nurse (half-time)	1

*q.s. - inventory varies as needed.

APPENDIX C

EMERGENCY EQUIPMENT
(Continued)

Emergency equipment at the Medical Facility, HS-2, continued:

SPECIAL EQUIPMENT - PORTABLE:

Beeper	1
Stretcher	1
Wheel chair	1
Oxygen unit	1
Intravenous holder and solution	1
Otoscope/ophthalmoscopes	1
Sphygmomanometer	1
Stethoscope	1
Contamination apparel	q.s.
Eye irrigation system	1
Inflatable limb traction splints (set)	1
Industrial first-aid kit	1
Cervical collar	1
Crutches (pair)	1

SUPPLIES:

Ample first aid supplies

*q.s. - inventory varies as needed.

APPENDIX I

RCRA PERSONNEL
TRAINING PLAN FOR MIXED WASTE UNITS

Project No. 301215.01.03.02
June 1992

RCRA
Personnel Training Plan
For Mixed Waste Units

Los Alamos National Laboratory
Environmental Protection Group
Los Alamos, New Mexico 87545

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PERSONNEL TRAINING PLAN FOR MIXED WASTE UNITS

1.0 INTRODUCTION

This document describes the personnel training program for Los Alamos National Laboratory (LANL) in accordance with the regulatory requirements of New Mexico Hazardous Waste Management Regulations, Revision 6 (HWMR-6), Part V, which adopt 1990 Code of Federal Regulations Title 40 (40 CFR). This document satisfies training requirements set forth in 40 CFR Part 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, and Part 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Training requirements for facility personnel are specified in 40 CFR 264.16 and 265.16, Personnel Training. The primary objective of the training program is to prepare persons to operate and maintain safely those areas handling mixed waste. This training program applies to all employees of the U.S. Department of Energy (DOE), the University of California, and their contractors who regularly work at the facility and who handle or generate mixed waste. The degree of training varies with the duties, but all such personnel receive, at a minimum, an introduction to the Resource Conservation and Recovery Act (RCRA).

1.1 SITE DESCRIPTION

LANL and the residential communities of Los Alamos and White Rock are located in north-central New Mexico on the Pajarito Plateau, situated west of the Rio Grande on the eastern slopes of the Jemez Mountains. The LANL site covers about 111 square kilometers (27,500 acres) in and adjacent to Los Alamos County, and includes 34 active Technical Areas (TAs).

The principal mission of LANL is the application of science and technology to solve national problems including weapons development, energy supply, and conservation programs, while basic scientific research complements and strengthens its fundamental technical capabilities. LANL is owned by the DOE, and co-operated by DOE and the University of California.

1.2 MIXED WASTE

Mixed waste contains both a hazardous waste, as defined by and regulated under RCRA, and a radioactive waste. The mixed waste generated at LANL is comprised of three general types:

- Waste from research and development [this includes, but is not limited to, spent laboratory solvents, discarded equipment, and high explosive (HE) mixed waste]
- Waste from process operations
- Waste from decontamination and decommissioning projects

Mixed waste generated at LANL is either transuranic (TRU) mixed waste or low-level mixed waste. TRU waste is defined in DOE Order 5820.2A, "Radioactive Waste Management," as waste containing alpha-emitting transuranic radionuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram at the time of assay, without regard to source or form. Low-level waste is defined in DOE Order 5820.2A as "waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel, or 11e(2) byproduct material as defined by this Order." High-level waste is defined in DOE Order 5820.2A as waste material resulting from the reprocessing of spent nuclear fuel. No high-level waste is generated at LANL. Byproduct material, as defined in Section 11e(2) of the Atomic Energy Act of 1954, as amended, consists of uranium and thorium mill tailings; 11e(2) byproduct material is not generated at LANL.

Mixed waste storage and treatment units in operation at LANL are summarized in Table 1. The location of each of the units is shown on Figure 1. Mixed waste units at LANL include container storage areas, surface impoundments, storage tanks, a controlled air incinerator, cementation units for process residue, an oxygen sparging unit for pyrophoric mixed waste, and two detonation units for HE mixed waste. TRU mixed waste is stored at TA-3, TA-54 (Area G), and TA-55. Low-level mixed waste is stored at most mixed waste units. Solid mixed waste types include lead shielding, decommissioned gloveboxes and equipment, and cemented process residue. Spent solvents and laboratory reagents, analytical solutions, combustible liquids, and aqueous process waste comprise the liquid mixed waste types. Additionally, compressed gases are a third type of mixed waste handled at LANL.

1.3 MIXED WASTE MANAGEMENT/RESPONSIBILITIES

The organizational structure of the Environmental Management (EM) Division is presented on Figure 2. EM Division is responsible for all waste management activities except for HE mixed waste treatment, which is handled by the Design Engineering (WX) and Dynamic Testing (M) Divisions. Individuals who are directly involved in waste management activities are in the Waste Management Group (EM-7). Johnson Controls World Services Inc. (JCI) provides trained personnel to assist EM-7 in waste handling activities. The Environmental Protection Group (EM-8) is responsible for RCRA compliance. Health and Safety (HS) Division personnel in the Occupational Medicine (HS-2), Risk Management Support (HS-3), and Industrial Hygiene and Safety (HS-5) Groups and personnel in the Environmental Protection (EM-8) Group are trained in their specialties to provide emergency response support. The Protection Technology Los Alamos (PTLA) Protective Force is responsible for LANL security, traffic control, and site access control. The Emergency Management Office (EMO) provides emergency planning and response at LANL, and has the overall responsibility for LANL's Emergency Response Plan training.

2.0 TRAINING CONTENT, FREQUENCY, AND TECHNIQUES

The training program instituted at LANL includes a combination of internal training courses, on-the-job training, and courses taught by outside contractors. Each of these types of training is described in Sections 2.1 through 2.4. Records of formal training for each individual who handles mixed waste are maintained in the HS-3 training office. Training records of current employees are maintained electronically until closure of the facility. Training records for former employees are kept for at least three years from the date the employee last worked at the facility. All new LANL and JCI employees will receive the appropriate level of training within six months of their date of hire or transfer. Personnel will not work in unsupervised positions until they successfully complete the appropriate level of training for their position and responsibilities.

The training outline (Attachment 1) is on file in the HS Division Office and is available for review by all mixed waste management and handling personnel, emergency response personnel, and all regulatory agencies. Course content will be reviewed annually and updated as required to maintain currency with RCRA. The required skills, education, and training for employees who handle mixed waste and the duties and responsibilities for each job description are on file at the facility.

2.1 INTERNAL TRAINING

The personnel training courses emphasize the safe handling of mixed waste. Program instructors are trained in mixed waste management procedures and RCRA provisions. The training program is designed to provide training which is appropriate for the employee's responsibilities. Employees who handle mixed waste, clean up spills or releases of mixed waste, and supervisors of these employees receive instruction on the appropriate topics listed in Attachment 1. Additionally, employees who conduct inspections of mixed waste units and those responsible for preparing paperwork that must be used for the transport, treatment, or storage of mixed waste receive training, as necessary, listed in Attachment I.

2.2 ON-THE-JOB TRAINING

All waste handling personnel will participate in on-the-job training programs. These programs are designed to give field demonstrations of LANL procedures for mixed waste handling, inspections, and transportation requirements. Personnel responsible for directing on-the-job training participate in the RCRA provisions course so that they are familiar with mixed waste management procedures as regulated by RCRA.

2.3 EXTERNAL TRAINING

In addition to internal training, selected personnel will participate in contractor-taught courses. These contractor-taught courses will serve to supplement the internal training program.

2.4 TRAINING COORDINATOR

The personnel training program is directed by Dr. Thomas C. Gunderson. As the EM Division Leader, Dr. Gunderson is knowledgeable about mixed waste management facilities, practices, and emergency procedures. Dr. Gunderson is responsible for coordinating the internal and external training courses and for assuring that all personnel receive the required training.

3.0 EMERGENCY RESPONSE TRAINING

If called upon by the Emergency Management Office (EMO), the outside professionals (JCI and the PTLA Protective Force) assist the LANL Emergency Manager (Incident Commander) at the scene of a mixed waste emergency. These professionals are trained in their specialties (e.g., heavy equipment operation, traffic control, security). JCI personnel are also trained in personal safety. At all times during an emergency, these contractors are under the direct supervision of the Emergency Manager (Incident Commander) and other trained LANL personnel.

In order to ensure maximum protection of life and property and to mitigate the consequences of an emergency situation, it is imperative that all HS and EM personnel, WX and M Division personnel, and JCI personnel involved in waste handling and emergency response be knowledgeable about appropriate building and operating area emergency procedures. These groups will participate in LANL's emergency response training program.

Division and group leaders and immediate supervisors are responsible for ensuring that education and training in site-specific emergency response procedures and in LANL's emergency response program are provided. Training in site-specific emergency response procedures is given by the operating group, and the EMO provides training for implementation of LANL's emergency response program. Periodic unannounced emergency drills and exercises are used to familiarize employees with emergency procedures. Training is also provided through prominent instruction displays and through presentations and discussions in safety meetings.

Each new or transferred employee is indoctrinated by an immediate supervisor regarding the RCRA requirements which apply to job-related activities, the general emergency procedures, and the specific emergency procedures related to the work area. The immediate supervisor also advises each employee of changes to any emergency procedures. An annual refresher of procedures affecting the work area and applicable RCRA requirements is given by EM-8. A record of training will be kept in the sponsoring organization's office file or at the HS-3 training office.

Specialized training is given to those employees assigned special functions of specific emergency duties. Emergency response personnel (e.g., HS-1, -2, -3, -5, and -12, EM-7 and -8,

Emergency Managers/HAZMAT Team Members, Nuclear Materials Technology (NMT) Division, and Waste Management Coordinators) participate in the Emergency Response Plan training program given by the EMO and are required to attend courses sponsored by EM-8 and HS-3 on implementation of the RCRA contingency plan, spill response, and OSHA emergency response provisions. All waste management and handling personnel in EM-7, WX and M Divisions, and JCI also participate in a training program in which they are instructed in emergency procedures pertinent to their work area. This site-specific instruction is given by the operating group.

4.0 IMPLEMENTATION OF TRAINING PROGRAMS

General Employee Training (GET) is the introductory training program given on the first day of employment for all new employees. GET includes, but is not limited to: Environment, Safety, and Health (ES&H) policy, OSHA rights and regulations, industrial safety, waste minimization, general radiation protection, industrial hygiene, emergency management, and fire protection. An Extended GET is given to all employees who will handle or be associated with mixed waste. The Extended GET includes courses in hazard communications, waste generator training, and radiation worker protection. Employees attend any or all of these courses, as required, depending on the employee's position and job responsibilities. Employees will not work in unsupervised positions until they have been trained. Employees transferring within divisions of the facility will receive training as if they were new employees (Section 2.0).

All mixed waste management and handling personnel must attend annual refresher courses. These courses are intended to update personnel on LANL procedures and provide them with an overview of their introductory training. In addition, a complete respirator and/or self-contained breathing apparatus (SCBA) training course is taught annually, or as appropriate, and must be successfully completed by mixed waste handling personnel. Group leaders, along with the training coordinator, will ensure that all their personnel participate in the introductory and annual training programs.

In addition to the GET training, a hazardous waste identification training course (Waste Generator Training) has been initiated at LANL to assist waste generators in the waste identification process. Waste Generator Training is offered as part of the Extended GET. This course provides hazardous and mixed waste generators with the background needed to identify those wastes which are subject to RCRA regulations in 40 CFR Part 261. The training addresses the definition of hazardous waste and hazardous constituents (including hazardous components in mixed waste) as well as how to identify hazardous waste and hazardous constituents. In addition, the Waste Generator Training informs mixed waste generators of their responsibilities and requirements, and supports the documentation of process knowledge, which generators use to characterize mixed waste.

TABLES

TABLE 1

MIXED WASTE STORAGE AND TREATMENT UNITS AT LOS ALAMOS NATIONAL LABORATORY

TA AND BUILDING OR AREA DESCRIPTION	CAPACITY	WASTE MANAGED	ACTIVITY DESCRIPTION
TA-3-29, Wing 9 Basement, (2 areas)	2,000 gallons	Lead shielding waste	Storage
	16,500 gallons	Cemented process waste from plutonium recovery operations; waste may contain Toxicity Characteristic (TC) metals, listed solvents	Storage
TA-15-184, PHERMEX Facility	100 pounds of material per detonation	HE mixed waste; ignitable, reactive, TC metals may be present	HE mixed waste treatment by detonation
TA-16-88	275 gallons	Classified mixed waste	Storage
TA-21-61	5,500 gallons	Low-level mixed waste; RCRA characteristic and listed waste may be present	Storage
TA-36-8, MINIE Firing Site	500 pounds of material per detonation	HE mixed waste; ignitable, reactive, TC metals may be present	HE waste treatment by detonation
TA-50-1-60A Liquid Waste Treatment Facility	660 gallons/day	Pretreatment sludge from plutonium recovery/processing operations; TC metals and F-listed solvents may be present	Treatment by stabilization of waste using cement
TA-50-1-60D Liquid Waste Treatment Facility	825 gallons	Cemented pretreatment sludge from plutonium recovery processing operations	Storage
TA-50-37 Controlled Air Incinerator	1.5×10^6 BTUs/hour	Combustible liquids and solids, both TRU and low-level; F-listed solvents and TC metals may be present	Waste incineration with flue gas treatment
TA-50-37, Rooms 115, 117, and 118	Room 115 - 220 gallons Room 117 - 3,630 gallons Room 118 - 18,000 gallons	Liquid and solid combustible waste; ignitable waste, F-listed solvents and TC metals may be present	Storage/staging areas for incinerator

TABLE 1
(Continued)

TA AND BUILDING OR AREA DESCRIPTION	CAPACITY	WASTE MANAGED	ACTIVITY DESCRIPTION
TA-50-37, Room 115 Liquid waste feed tanks	310 gallons	Liquid combustible waste; F-listed solvents and TC metals may be present	Liquid waste blending and storage prior to incineration
TA-50-69	30,000 gallons - outside 1,500 gallons - inside	Oversized solid mixed waste, primarily lead/lead-containing solids such as gloveboxes, shielding and equipment	Storage prior to processing at Size Reduction Facility
TA-50-114 Modular storage shed	990 gallons	Solidified process waste; waste may contain TC metals and F-listed solvents	Storage
TA-53-166 3 Surface impoundments	2,580,000 gallons (S) 1,629,144 gallons (NW) 1,629,144 gallons (NE)	Waste in surface impoundments; waste may contain listed solvents and TC metals	Storage
TA-54 Area L	153,700 gallons (total of mixed waste subunits)	Low-level liquid mixed waste and gas cylinders; RCRA characteristic, F- P-, and U-listed mixed waste may be present	Storage
TA-54 Area G	7,133,775 gallons (total of mixed waste subunits)	Primarily solid TRU and low-level mixed waste	Storage
TA-55-4			
Container storage area	50 gallons	Evaporator salt precipitate	Storage
Container storage-vault	1,100 gallons	Pyrophoric salts, analytical solutions	Storage
3 Container storage areas	27,500 gallons	TRU mixed waste	Storage
Container storage area	3,400 gallons	Low-level mixed waste	Storage
Container storage area	3,400 gallons	Oversized TRU mixed waste	Storage
Container storage pad near TA-55-4	135,000 gallons	Solid mixed waste; primarily gloveboxes	Storage

TABLE 1
(Continued)

TA AND BUILDING OR AREA DESCRIPTION	CAPACITY	WASTE MANAGED	ACTIVITY DESCRIPTION
TA-55-4 (Continued)			
13 tanks	410 gallons total	TRU evaporator bottoms solution	Storage prior to solidification
Cementing process	110 gallons/day	TRU evaporator bottoms solution, analytical solutions, organic liquid and solid particulates	Treatment by stabilization using cement
Oxygen sparging furnace	0.26 pounds/hour	TRU pyrophoric salt waste	Treatment of pyrophoric salt

FIGURES

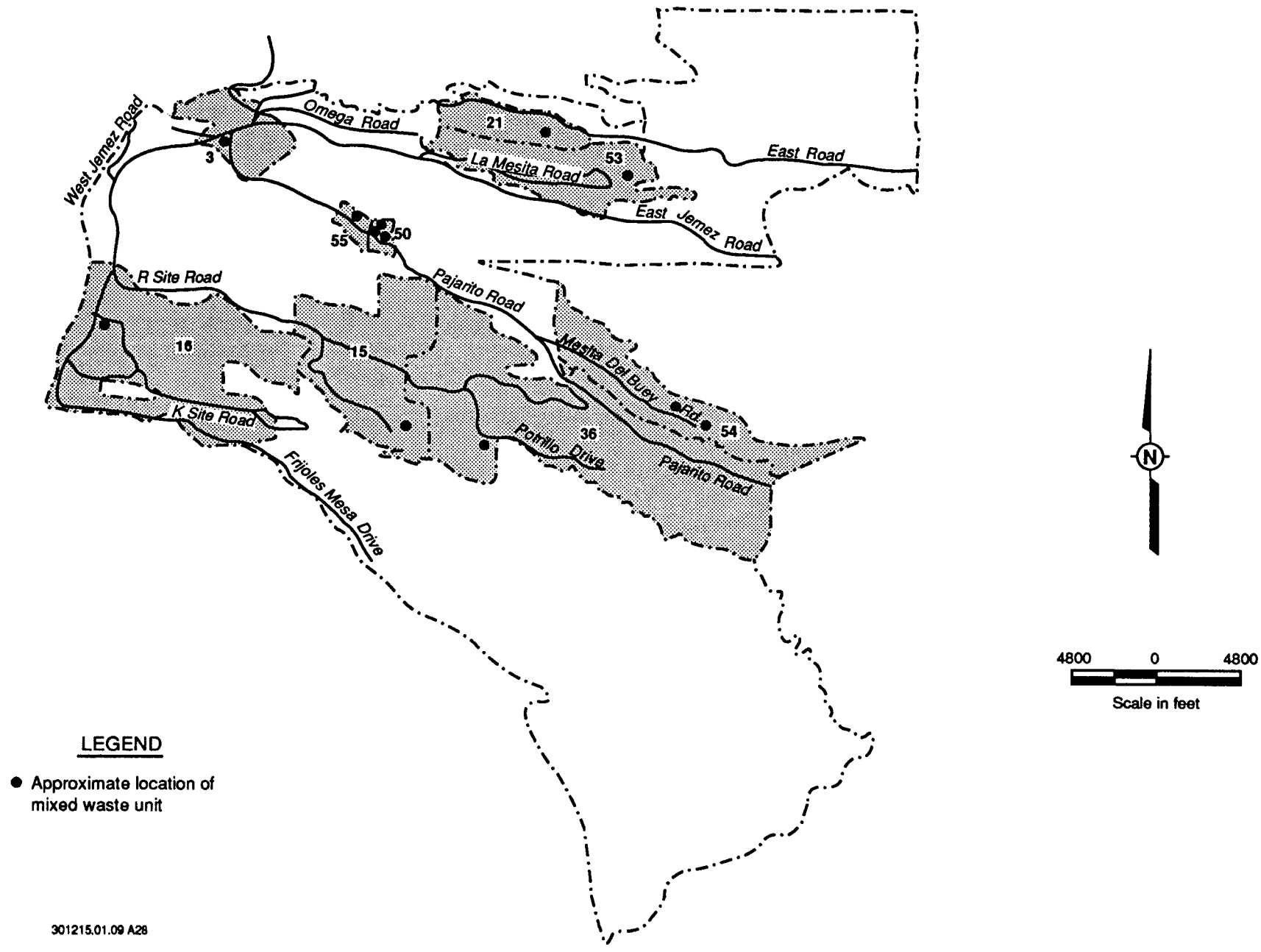

Figure 1. Technical areas with mixed waste storage and treatment units.

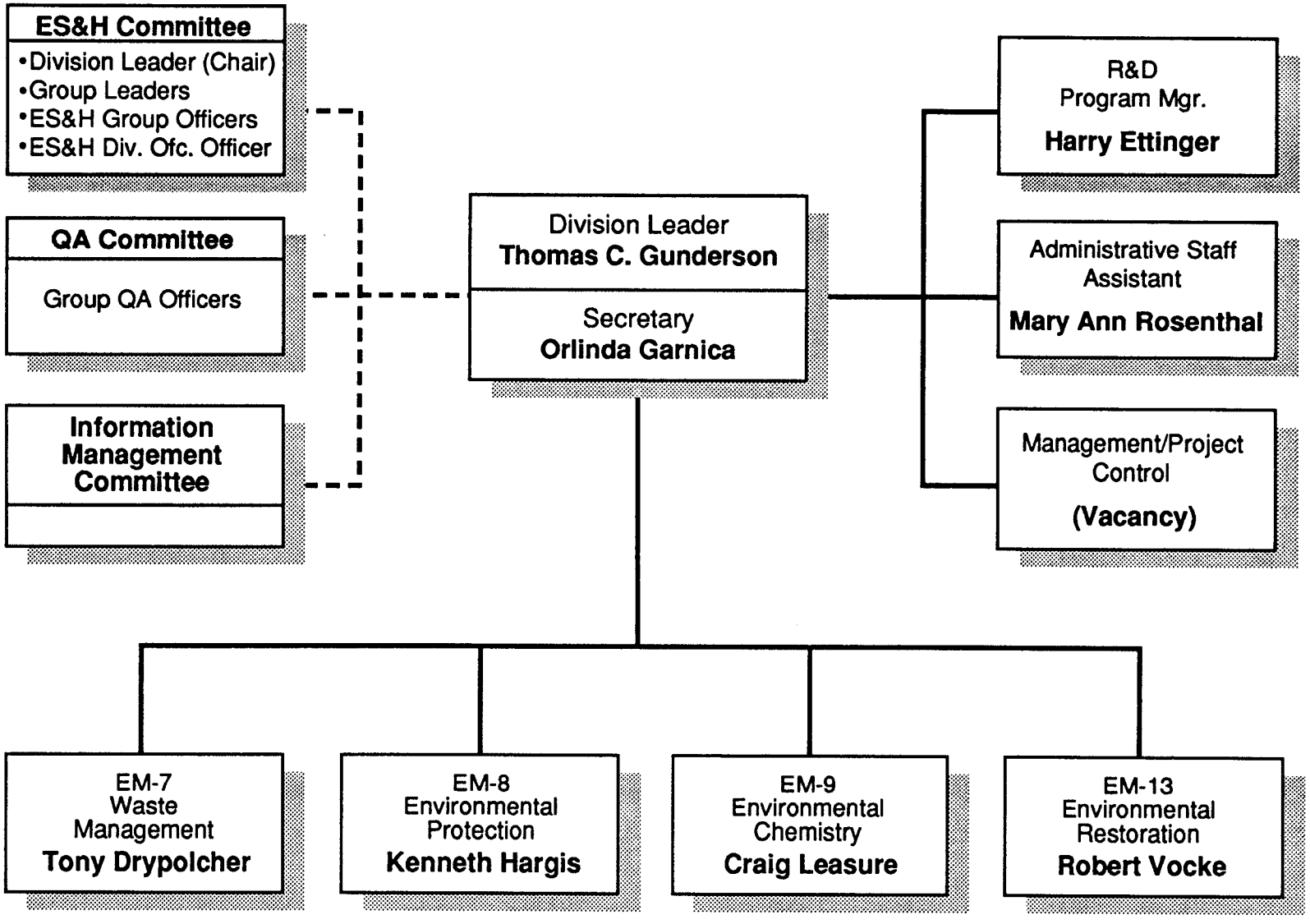

Figure 2. Los Alamos National Laboratory Environmental Management (EM) Division.

ATTACHMENT 1

OUTLINE OF LOS ALAMOS NATIONAL LABORATORY'S TRAINING PROGRAMS

ATTACHMENT 1

OUTLINE OF LOS ALAMOS NATIONAL LABORATORY'S TRAINING PROGRAMS

IC: internal classroom instruction

EC: external classroom instruction

OJT: on-the-job training

I. RCRA PROVISIONS

A. Legislation (Federal/State) - (IC, EC) introductory with annual update. Brief overview of legislative mandates.

B. Regulations (Federal/State) - (IC, EC) introductory with annual update.
1. Overview of 40 CFR Parts 260-265, 268 (N.M. HWMR Parts I & II)
2. Overview of DOT shipping regulations
3. Familiarization with LANL emergency response, recordkeeping.

II. PERSONNEL HEALTH AND SAFETY

A. Familiarization with Standard Operating Safety Guidelines (IC)

B. Safe Handling of Chemicals (EC, IC)
1. Explosive/fire hazards, chemical burns, chemical compatibility
2. Eye/skin hazards and protection
3. Respiratory hazards and protection

C. First Aid (IC) introductory, triennial recertification

D. CPR (IC) introductory, annual recertification

E. Use of health and safety (H&S) equipment (IC, OJT)
1. Safety showers, eyewashes
2. Fire extinguishers
3. Alarm system
4. Communication system

F. Radiation protection and radiation worker training (IC)

III. RESPIRATOR USE

A. Air-Purifying Devices (IC) introductory, annual
1. Use
a) Operation and inspection of device
b) Changing filters
c) Donning and taking off equipment
d) Safety features

ATTACHMENT 1

OUTLINE OF LOS ALAMOS NATIONAL LABORATORY'S TRAINING PROGRAMS (Continued)

2. Care and cleaning
3. Fitting

B. Self-Contained Breathing Apparatus (IC) introductory, annual
1. Use:
   a) Operation and inspection of device
   b) Changing compressed air bottles
   c) Donning and taking off equipment
   d) Safety features
2. Care and cleaning
3. Fitting

IV. HAZARDOUS AND MIXED WASTE HANDLING AND OPERATIONS

A. Controlled Air Incineration (OJT) introductory with annual update
1. Familiarization with Standard Operating Procedure (SOP)
2. Familiarization with Operating Manual
3. Supervised Operation of Facility
4. Emergency Shutdown Procedures
5. Evacuation Procedures
6. Accidental Release and Spill Response Procedures (IC, OJT)
7. Familiarization with Emergency Equipment Use, Inspection, Repair, etc. (IC, OJT)
8. Use of Communication/Alarm System (IC, OJT)
9. Contingency Plan Training (IC, OJT)

B. High Explosives (HE) Detonation (OJT) introductory with annual update
1. Familiarization with SOP
2. Supervised Operation of Facility
3. Emergency/Evacuation Procedures (including shutdown of operations)
4. Accidental Release and Spill Response Procedures (IC, OJT)
5. Familiarization with Emergency Equipment Use, Inspection, Repair, etc. (IC, OJT)
6. Use of Communication/Alarm System (IC, OJT)
7. Contingency Plan Training (IC, OJT)

C. Non-HE Reactives, Corrosives, Ignitables, Toxics
1. Chemical Hazards and Reactions (EC)
2. Emergency Procedures (including waste feed cut-off systems, shutdown of operations, response to fire or explosion) (OJT)
3. Accidental Release and Spill Response Procedures (IC, OJT)
4. Familiarization with Emergency Equipment Use, Inspection, Repair, etc. (IC, OJT)
5. Communication/Alarm System (IC, OJT)
6. Contingency Plan Training (IC, OJT)

ATTACHMENT 1

OUTLINE OF LOS ALAMOS NATIONAL LABORATORY'S TRAINING PROGRAMS (Continued)

V. RECORDKEEPING/INSPECTIONS (IC, EC, OJT) introductory

A. Use of Manifest System (on-site) and Waste Profile Sheets

B. Operating Records

C. Reporting

D. Inspections
1. Facility
2. Operating Equipment
3. Safety/Emergency Equipment
4. Security System

VI. TRANSPORTATION (OJT) introductory

A. On-Site
1. Packaging
2. Placarding/labeling
3. Manifesting/recordkeeping
4. Internal Procedures
5. Waste Segregation

B. Off-Site
1. Packaging
2. Placarding/labeling
3. Manifesting/recordkeeping
4. Internal Procedures
5. Waste Segregation

Supervisors and staff receive training appropriate to their degree of handling mixed waste (e.g., reporting and other procedures required for compliance). Material handlers are trained in the hands-on aspects such as maintenance of operating records, plant operations, and response to spills or other emergencies.