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Voluntary Corrective Action Plan for

Potential Release Sites

21099, DP 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Removal of Contaminated Soil

Field Unit 1

Environmental
Restoration
Project

Los Alamos

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ACRONYMS

bgs	below ground surface
BOA	Basic Operating Agreement
BTEX	benzene, toluene, ethylbenzene, and xylenes
DOE	Department of Energy
EPA	Environmental Protection Agency
LANL	Los Alamos National Laboratory
MCAL	Mobile Chemical Analytical Laboratory
MEK	methyl ethyl ketone or 2-butanone
NMED	State of New Mexico Environment Department
PPE	personal protective equipment
ppm	parts per million
PRS	Potential Release Site
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SVOC	semi-volatile organic compounds
TAL	Target Analyte List
TCLP	Toxic Characteristic Leaching Potential
TPH	total petroleum hydrocarbons
TSD	treatment, storage, and disposal
UST	underground storage tank
VCA	Voluntary Corrective Action
VOC	volatile organic compounds

1.0 INTRODUCTION

1.1 Site Description and Operational History

This Voluntary Corrective Action (VCA) Plan addresses Potential Release Site (PRS) 21-029, DP Tank Farm. The site is located near the western end of DP Mesa on a moderate slope descending from DP Road towards DP Canyon. The site occupies property that is currently bounded by the Knights of Columbus Hall on the west and a Los Alamos County fire station facility on the east. The site is surrounded by an 8-foot chain link fence (Figure 1).

The DP Tank Farm site is the former location of 15 fuel storage tanks and two fill stations (Figure 2). The tank farm was operational from January 1946 to February 1985. Reported tank capacities ranged from approximately 2,100 gallons to approximately 51,000 gallons. The tanks were used primarily for the storage of petroleum hydrocarbon products (gasoline, diesel, kerosene, ethanol, and No. 2 fuel oil). The tanks may not have been dedicated to the storage of a single petroleum product and may have contained different products at different times. There are no known records of any radioactive materials being stored in any of the tanks. All tanks and structures at the site were decommissioned and removed in 1988. During site decommissioning, it was determined that only one tank had leaked. The remaining tanks and underground distribution piping were reported to have been in good condition. A 4-foot earthen berm encompassed the northern boundary of the tank farm. A storm drain reportedly discharged surface runoff through the berm at the northeast corner of the property. A 1994 site inspection revealed two, 24-inch culverts discharging into DP Canyon. However, no storm drains have been located.

1.2 COPCs and Rationale for Proposed Remedial Action

Results of the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and State of New Mexico Environment Department (NMED) underground storage tank (UST) investigation indicate that contaminants of potential concern (COPCs) present at the DP Tank Farm site include benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH).

Site remediation is not anticipated to be required under the State of New Mexico UST regulations because highly contaminated soils, as defined in the regulations, were not found to be present nor was the soil contamination located within 50 feet of groundwater. As a result, site closure and an agreement that no further action is necessary at this site are expected from NMED. An RFI report was submitted to the Environmental Protection Agency (EPA) in January 1996 requesting concurrence that no further action is required for the site.

The DP Tank Farm property is currently owned by the Department of Energy (DOE). The land is anticipated to be transferred to Los Alamos County for commercial use in the foreseeable future. Therefore, in the interest of best management practices, the site will be remediated to a cleanup level of 1,000 parts per million (ppm) TPH, 500 ppm BTEX, and 10 ppm benzene prior to the land transfer. Petroleum-contaminated soils with these concentrations or greater are regulated as a New Mexico special waste. Therefore, these cleanup levels will remove petroleum-contaminated soils from the site that would be classified as a New Mexico special waste.

Removing petroleum-contaminated soil to a cleanup level of 1,000 ppm TPH will also remove benzene to concentrations below approximately 6 ppm. Removing the benzene-contaminated soil to a cleanup level below 10 ppm will remove a potential health risk if the property is commercially developed and a building is constructed on the site of the east fill station location.

2.0 SITE CHARACTERIZATION

Although the tanks, piping, and fill stations were removed in 1988, subsurface petroleum hydrocarbon contamination is known to be present at the site. Based on the results of the 1994 RFI and 1995 UST

investigations, contamination is present in the vicinity of the former fill station locations, as described in the following sections.

2.1 RFI Information/Other Decision Data

The 1994 RFI involved drilling and sampling 12 boreholes near the two former fill station locations and three of the former UST locations. In addition, surface samples were collected from the top 6 inches of soil in the vicinity of the DP Tank Farm outfall (Figure 3). All samples were submitted to a fixed laboratory for analysis of volatile organic compounds (VOCs) by EPA SW 846 Method 8240, semi-volatile organic compounds (SVOCs) by EPA SW 846 Method 8270, Target Analyte List (TAL) metals by EPA SW 846 Method 6010, Toxic Characteristic Leaching Potential (TCLP) metals, ethanol, gross alpha, beta, and gamma radiation, and gamma spectroscopy.

Results of the 1994 RFI indicated that petroleum hydrocarbons are present at the DP Tank Farm site at both former fill station locations. In particular, BTEX was detected in two boreholes, 21-2558 and 21-2559, drilled and sampled at the former east fill station location at concentrations in excess of 500 ppm at depths between 5.0 and 10.0 feet bgs in both boreholes. Benzene was not detected at concentrations greater than 10 ppm in boreholes at either former fill station location and TPH was not analyzed for during the 1994 RFI. The 1994 data is presented in Annex 7.2. Although BTEX is not shown collectively in the table, the total BTEX concentration can be determined by adding the concentrations of the individual constituents.

The 1995 investigation was conducted in accordance with State of New Mexico UST regulations because the results of the 1994 RFI indicated that petroleum hydrocarbons were the only COPCs at the DP Tank Farm site. The investigation focused on the former east and west fill station locations where petroleum hydrocarbon contamination was detected during the 1994 RFI (Figure 4). All samples were analyzed for BTEX constituents by EPA SW 846 Method 8020 and TPH by modified EPA SW 846 Method 8015 by Los Alamos National Laboratory's (LANL's) Mobile Chemical Analytical Laboratory (MCAL). Samples were also analyzed for acetone and methyl ethyl ketone (MEK or 2-butanone) by EPA SW 846 Method 8020 to confirm the presence of laboratory contamination from the two compounds.

The 1995 investigation at both fill station locations consisted of drilling and sampling 13 boreholes. Four vertical boreholes and one angled borehole were drilled at the former west fill station location. Seven vertical boreholes and one angled borehole were drilled at the former east fill station location. Both angled boreholes (21-3003 drilled at the former west fill station location and 21-3008 drilled at the former east fill station location) were drilled at 45 degree angles from the horizontal. Boreholes drilled at the former west fill station location ranged in depth from 35 to 45 feet below ground surface (bgs). Boreholes at the former east fill station location ranged in depth from 17.5 to 65 feet bgs. Borehole 21-3009 was only drilled to 17.5 feet bgs because it was located on a steep slope south of the former fill station location. Although petroleum hydrocarbon contamination was still present at 17.5 feet, the drilling was terminated because the drill rig was not stable on the slope, which created an unsafe drilling condition.

Results of the 1995 UST investigation indicated that TPH, BTEX, and benzene compounds are present in the subsurface at concentrations exceeding 1,000, 500, and 10 ppm, respectively, at the east fill station location only. In addition, data validation of the 1994 RFI analytical results and 1995 MCAL results showed that MEK and acetone were laboratory contaminants. The 1995 data is presented in Annex 7.2.

2.2 Nature and Extent of Contamination

2.2.1 East Fill Station Location

The 1995 UST investigation at the former east fill station location revealed that BTEX was present at concentrations in excess of 500 ppm in borehole 21-3006 at depths ranging from approximately 9 to 20

feet bgs and in borehole 21-3008 at depths from approximately 13 to 15 feet bgs. Benzene was detected at concentrations greater than 10 ppm in borehole 21-3006 at a depth between 9 and 10 feet bgs and in borehole 21-3008 at depths between 13 and 20 feet bgs (Figure 5). TPH was detected at concentrations greater than 1,000 ppm in samples collected from boreholes 21-3006, -3008, -3009, and -3011 at depths ranging from approximately 4 to 35 feet bgs (Figure 6). TPH concentrations in these samples ranged from >900 ppm to 8,239 ppm.

The 1994 RFI investigation revealed that BTEX was present at concentrations greater than 500 ppm at depths between 5.0 and 10.0 feet in boreholes 21-2558 and -2559. These boreholes were located adjacent to the 1995 borehole 21-3006 location.

2.2.2 West Fill Station Location

The 1995 UST investigation at the former west fill station location revealed that neither TPH, BTEX, nor benzene were detected in samples collected from any of the boreholes at concentrations greater than 1,000, 500, and 10 ppm, respectively (Figures 7 and 8). These results agree with results of the 1994 RFI which showed that neither BTEX nor benzene were detected at concentrations in excess of 500 and 10 ppm, respectively, at the former west fill station location.

2.3 Summary

The 1995 UST investigation of the former east fill station location indicated that TPH was detected at concentrations above 1,000 ppm in samples collected from boreholes 21-3006, -3008, -3009, and -3011 at depths ranging from 4 to 35 feet bgs. Analytical results also indicated that BTEX was detected in boreholes 21-3006 and -3008 at concentrations greater than 500 ppm at depths between approximately 9 feet and 20 feet bgs. Benzene was detected at concentrations greater than 10 ppm in boreholes 21-3006 and -3008 at depths between 9 and 20 feet bgs. The lateral extent of contamination is bounded by boreholes 21-3007, -3010, -3012, and -3013, from which neither TPH, BTEX, nor benzene were detected at concentrations above the analytical detection limits (Figures 9 and 10). Therefore, petroleum hydrocarbons at concentrations greater than New Mexico special waste limits are vertically bounded by a depth of 35 feet bgs and a lateral area of approximately 1,800 square feet.

The results of both the 1994 RFI and 1995 UST investigations at the former west fill station location indicated that neither TPH, BTEX, nor benzene were detected at concentrations greater than their respective cleanup levels in any of the boreholes.

3.0 PROPOSED REMEDY

3.1 Description of the Proposed Remedial Action

Excavation, transportation, and disposal of petroleum-contaminated tuff with TPH, BTEX, and/or benzene concentrations in excess of New Mexico special waste limits will be conducted by a LANL Basic Operating Agreement (BOA) contractor in conjunction with a LANL approved and permitted waste treatment, storage, and disposal (TSD) subcontractor, as will the site restoration. All work will be conducted in accordance with the approved Site-Specific Health and Safety Plan, Waste Characterization Strategy, Spill Prevention, Control, and Countermeasures Plan, and Storm Water Pollution Prevention Plan.

Based on analytical results from the 1994 Phase I RFI and 1995 UST investigation, TPH, BTEX, and benzene concentrations exceeding special waste limits are only present at the former east fill station location. These concentrations were detected in boreholes 21-3006, -3008, -3009, and -3011, and extend to an approximate depth of 35 feet bgs. Petroleum-contaminated tuff will be removed from the east fill station location to a depth of 35 bgs using a trackhoe, or similar equipment, as required by site conditions and as determined by the approved TSD subcontractor. The contaminated material may be

excavated and placed directly into bulk containers for removal from the site or stockpiled, pending excavation of all contaminated material and a calculation of the total volume of waste material.

3.2 Basis for Cleanup Levels

The DP Tank Farm property is currently owned by the DOE. The land is anticipated to be transferred to Los Alamos County for commercial use in the foreseeable future. Therefore, in the interest of best management practices, the site will be remediated to a cleanup level of 1,000 ppm TPH, 500 ppm BTEX, and/or 10 ppm benzene, which are the limits above which waste is classified as a New Mexico special waste, prior to the land transfer. Therefore, using this approach, it is not anticipated that there will be any contaminated soil left at the site that would be classified as a New Mexico special waste if the property is developed for commercial use.

Removing petroleum-contaminated soil to a cleanup level of 1,000 ppm TPH will also remove benzene to concentrations below approximately 6 ppm. Removing the benzene-contaminated soil to a cleanup level below 10 ppm will remove a potential health risk if the property is commercially developed and a building is constructed on the site of the east fill station location.

3.3 Site Restoration

Upon receipt of verification sample results confirming the site has been remediated in accordance with this VCA plan, the excavation at the former east fill station location will be backfilled with a clean, non-contaminated backfill material obtained from an approved laboratory contractor. The site will be reseeded with a native grass mixture as defined in the statement of work to the remediation/restoration contractor.

4.0 WASTE MANAGEMENT

4.1 Estimated Types and Volumes of Waste

By calculating the volume of contaminated tuff based on the known lateral and vertical extent of contamination, the expected quantity of petroleum hydrocarbon-contaminated tuff to be excavated is approximately 1,000 cubic yards. In addition, a small volume of solid and liquid wastes will be generated from cleanup activities and verification sampling. Wastes associated with this effort include disposable sampling equipment, personal protective equipment (PPE), plastic sheeting, and decontamination liquid. The nature and volumes of the wastes expected to be generated by the proposed cleanup is presented in Table 4-1.

**TABLE 4-1
ANTICIPATED WASTE VOLUMES**

Item	Type	Anticipated Volume
Sampling waste/PPE/plastic sheeting	solid - potentially petroleum contaminated	2 cubic yards (six 55-gal. drums)
Contaminated tuff	solid - BTEX and TPH contaminated	1,000 cubic yards
Decontamination water	liquid - potentially BTEX and TPH contaminated	10 gallons

4.2 Method of Management and Disposal

One on-site, temporary drum storage area will be located in an appropriate area at the work site. The area will be used as a temporary drum staging area containing petroleum-contaminated waste regulated under the State of New Mexico UST regulations.

As a temporary drum storage area, the location will meet the following minimum requirements:

- The area will be sited in a low-traffic location, downwind of areas where personnel may be actively working, and it will be secured.
- The site will be constructed and managed in the same manner as a registered <90-day storage area but will not be registered with ESH-19 as a hazardous waste storage area.
- The staging configuration will be established with a 2-foot minimum of aisle space to allow for visual inspection of drums. The area will be kept free of obstacles that could prevent free access by emergency personnel.
- All drums will be segregated according to compatibility of the materials they contain. It is not expected that any of the materials will be incompatible.
- Each drum will be lined and will contain either solid material or liquids (never both).
- All drums will be labeled with the accumulation start date and contents.
- Drums will be inspected at a minimum frequency of once weekly. Drum inspection and documentation will be performed by the On-site Waste Manager.

The excavated tuff will be removed for disposal at a land farm. Two land farms in New Mexico have been contacted and both have confirmed that they have the capacity to accept the material.

5.0 DESCRIPTION OF CONFIRMATION/VERIFICATION SAMPLING

After removal of the contaminated material, verification samples will be collected from the sidewalls and base of the east fill station excavation in order to ensure complete remediation of the lateral and vertical extent of contamination. A total of 20 samples will be collected from the excavation on the nodes of a 20-foot by 20-foot grid, which will be laid out on the sidewalls and base of the excavation. Four grab samples will be collected from each sidewall and from the base of the excavation. In addition, one field duplicate and one trip blank will be collected for QA/QC purposes. Samples will be collected for analysis of BTEX and TPH, by EPA SW 846 Method 8020 and modified EPA SW 846 Method 8015, respectively, by the MCAL. Ten of the samples will be submitted to a fixed laboratory for the same analyses to evaluate the performance of the MCAL.

Additional tuff will be excavated in 6-inch lifts where analytical results indicate that cleanup levels have not been met. Verification sampling will be repeated until analytical results indicate that cleanup levels have been met.

6.0 ESTIMATED TIME TO COMPLETE THE ACTION AND UNCERTAINTIES

It is estimated that approximately 15 working days will be required to excavate, load, and remove the contaminated tuff from the site. An additional five working days to backfill the excavations and restore the site will also be required.

7.0 ANNEXES

7.1 Risk-Based Cleanup Level Assumptions and Calculations

Risk-based cleanup level assumptions and calculations are not applicable.

7.2 RFI and UST Investigation Analytical Results

Analytical results are summarized in the following tables.

**1994 ANALYTICAL RESULTS FOR RADIONUCLIDES
DETECTED AT DP TANK FARM, SWMU[®] 21-029**

COMPARISON LEVELS FOR SOIL SAMPLES (pCi/g)	Cesium-137		Uranium-235	
	UTL ^b	1.4	0.088	
	SAL ^c	4	18	

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	UTL ^b	1.4	0.088	
	SAL ^c	4	18	

		ANALYTICAL RESULTS (pCi/g)	
LOCATION ID	SAMPLE ID	Cesium-137	Uranium-235
21-2553	AAB9702	0.0271	-
21-2553	AAB9704	0.0165	-
21-2554	AAB9706	-0.0324	-
21-2554	AAB9708	0.0238	-
21-2555	AAB9710	0.096	-
21-2555	AAB9712	0.0706	-
21-2556	AAB9713	-	0.4
21-2556	AAB9714	-	0.54
21-2556	AAB9715	-	0.27
21-2556	AAB9716	0.1399	0.32
21-2558	AAB9723	-	0.24
21-2558	AAB9724	-	0.47
21-2559	AAB9725	-	0.58
21-2559	AAB9725R	-	0.57
21-2559	AAB9726	-	0.25
21-2559	AAB9727	-	0.32
21-2559	AAB9728	-	0.34
21-2560	AAB9732	0.075	-
21-2560	AAB9732R	0.0019	-
21-2560	AAB9742	0.0091	-

		ANALYTICAL RESULTS (pCi/g)	
LOCATION ID	SAMPLE ID	Cesium-137	Uranium-235
21-2561	AAB9736	0.12	-
21-2562	AAB9738	-0.006	-
21-2562	AAB9741	0.001	-
21-2614	AAB9818	0.248	-
21-2615	AAB9819	0.357	-
21-2615	AAB9820	0.606	-

ADDITIONAL RADIONUCLIDES INCLUDED IN THE GAMMA SPECTROSCOPY OUTPUT ^d	
Actinium-226	Protactinium-231
Americium-241	Radium-223
Bismuth-211	Radium-224
Bismuth-212	Radium-226
Cesium-134	Radon-219
Cobalt-57	Sodium-22
Cobalt-60	Thallium-206
Lead-210	Thorium-227
Lead-212	Thorium-234
Lead-214	Tritium
Potassium-40	Water (Unbound)

*SWMU = Solid waste management unit.

^bUTL = Upper tolerance limit.

^cSAL = Screening action level.

^dAnalytical results for these radionuclides are not included because there is no toxicity information or background information available for them and their reported activities were extremely low.

1994 ANALYTICAL RESULTS FOR DETECTED ORGANIC ANALYTES AT DP TANK FARM, SWMU 21-029

LOCATION ID	SAMPLE ID	ANALYTICAL RESULTS (µg/g)																
		Aroclor 1248	Aroclor 1254	2,3,7,8-TCDF														
21-2650	AAB9702	<0.021	<0.006	<1.4	<0.021	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<1.4	<1.4	<0.006	<0.006	<0.006	<0.006	
21-2653	AAB9704	<0.021	<0.006	<0.33	<0.021	<0.006	<0.006	<0.006	<0.006	<0.006	<0.33	<0.33	<0.006	<0.006	<0.006	<0.006		
21-2654	AAB9706	<0.02	<0.006	<0.32	<0.02	<0.006	<0.006	<0.006	<0.006	<0.006	<0.32	<0.32	<0.006	<0.006	<0.006	<0.006		
21-2654	AAB9708	<0.02	<0.006	<0.31	<0.02	<0.006	<0.006	<0.006	<0.006	<0.006	<0.31	<0.31	<0.006	<0.006	<0.006	<0.006		
21-2654	AAB9710	<0.021	<0.007	<1.4	<0.021	<0.007	<0.007	<0.007	<0.007	<0.007	<1.4	<1.4	<0.007	<0.007	<0.007	<0.007		
21-2654	AAB9712	<0.022	<0.009	<0.34	<0.022	<0.009	<0.009	<0.009	<0.009	<0.009	<0.34	<0.34	<0.009	<0.009	<0.009	<0.009		
21-2650	AAB9715	<11	<2.7	<27	22	<2.7	<2.7	<2.7	<2.7	<2.7	<27	<27	<2.7	<2.7	19	8.3		
21-2650	AAB9714	8.4	<1.4	<36	20	2.0	2.0	<1.4	10	110	<36	<1.4	13	110	20	80		
21-2650	AAB9716	<10	<2.6	<37	27	<2.6	4.8	<2.6	10	00	<10	3.4	0.0	100	20	71		
21-2650	AAB9714	<2	<0.70	<20	<3	<0.70	0.3	<0.70	16	<2	<0.70	1	4.1	60	10	43		
21-2650	AAB9740	<0.12	<0.031	<0.37	<0.12	<0.031	<0.031	<0.031	<0.031	<0.031	<0.37	<0.37	<0.031	<0.031	<0.031	<0.031		
21-2650	AAB9804	<0.022	<0.006	<0.33	<0.022	<0.006	<0.006	<0.006	<0.006	<0.006	<0.33	<0.33	<0.006	<0.006	<0.006	<0.006		
21-2647	AAB9720	<0.022	<0.006	<0.30	<0.022	<0.006	<0.006	<0.006	<0.006	<0.006	<0.30	<0.30	<0.006	<0.006	<0.006	<0.006		
21-2650	AAB9721	<0.022	<0.006	<0.8	<0.022	<0.006	<0.006	<0.006	0.14	0	<0.8	<0.006	<0.006	0.031	2.1	0.020		
21-2650	AAB9722	<27	<0.7	<30	<27	<0.7	<0.7	<0.7	7.1	<27	<0.7	<0.7	0.0	100	21	100		
21-2650	AAB9725	<28	<0.0	<30	<28	<0.0	0.0	7.0	12	0.0	<28	0.0	0.0	270	40	470		
21-2650	AAB9724	<14	0	<27	<14	<0.0	110	0.0	10	<14	<27	20	200	200	0.0	0.0		
21-2650	AAB9900	<0.021	<0.006	<0.34	<0.021	<0.006	<0.006	<0.006	<0.006	<0.006	<0.34	<0.34	<0.006	<0.006	<0.006	<0.006		
21-2650	AAB9726	<14	<3.4	<37	<14	<3.4	<3.4	<3.4	0.0	<37	<3.4	<3.4	<3.4	100	40	144		
21-2650	AAB9720	<20	<7.3	<30	<20	<7.3	<7.3	<7.3	10	0.0	<20	<7.3	<7.3	210	20	221		
21-2650	AAB9727	<14	<3.4	<37	<14	<3.4	0.0	0.0	10	70	0.0	37	100	270	70	470		
21-2650	AAB9720	<20	<7.3	<30	<20	<7.3	0.0	10	14	0.0	<20	<7.3	<7.3	210	20	230		
21-2650	AAB9732	<0.022	<0.006	<0.34	<0.022	<0.006	<0.006	<0.006	<0.006	<0.006	<0.34	<0.34	<0.006	<0.006	<0.006	<0.006		
21-2650	AAB9745	<0.020	<0.006	<0.30	<0.020	<0.006	<0.006	<0.006	<0.006	<0.006	<0.30	<0.30	<0.006	<0.006	<0.006	<0.006		
21-2641	AAB9730	<0.021	<0.006	<0.33	<0.021	<0.006	<0.006	<0.006	<0.006	<0.006	<0.33	<0.33	<0.006	<0.006	<0.006	<0.006		
21-2642	AAB9730	<0.022	<0.006	0.07	<0.022	<0.006	<0.006	<0.006	<0.006	<0.006	<0.34	<0.34	<0.006	<0.006	<0.006	<0.006		
21-2640	AAB9741	<0.022	<0.006	<0.30	<0.022	<0.006	<0.006	<0.006	<0.006	<0.006	<0.30	<0.30	<0.006	<0.006	<0.006	<0.006		
21-2007	AAB9001	<0.021	<0.006	<0.30	<0.021	<0.006	<0.006	<0.006	<0.006	<0.006	<0.30	<0.30	<0.006	<0.006	<0.006	<0.006		
21-2610	AAB9010	<0.022	<0.006	<1.4	<0.022	<0.006	<0.006	<0.006	<0.006	<0.006	<1.4	<1.4	<0.006	<0.006	<0.006	<0.006		
21-2610	AAB9010	<0.021	<0.006	<1.4	<0.021	<0.006	<0.006	<0.006	<0.006	<0.006	<1.4	<1.4	<0.006	<0.006	<0.006	<0.006		
21-2610	AAB9020	<0.022	<0.006	<1.4	<0.022	<0.006	<0.006	<0.006	<0.006	<0.006	<1.4	<1.4	<0.006	<0.006	<0.006	<0.006		

*SAL = Screening action level.
 *NA = Not applicable value is available.

**SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995**

Borehole 21-3002

May 25, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm) (2)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK (3)	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
	0121-95-0	3.9		4.4	0.0	U (4)	U	U	U	U	U	
0009	8.8	9.4	0.1	U	U	U	U	U	U	U	U	U
0010	13.9	14.5	0.0	U	U	0.52	0.24	U	U	U	0.76	U
0011	19.2	19.8	0.0	U	U	0.59	0.27	U	U	U	0.87	U
0012	22.5	23.0	0.0	U	U	0.81	0.28	U	U	U	0.89	U
0139	29.0	29.5	NA (6)	U	U	0.81	0.27	U	U	U	0.87	U
0140	32.0	32.5	NA	U	U	0.58	0.28	U	U	U	0.82	U

Borehole 21-3003 (Angled at 45 degrees)

May 30, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
	0015	4.0		4.6	0.0	U	U	U	U	U	U	
0016	8.7	9.3	0.0	U	U	U	U	U	U	U	U	U
0017	13.5	14.3	165	U	U	U	U	U	U	U	U	>600 J
0018	18.5	19.2	181	U	U	U	U	U	U	U	U	>670 J
0019	23.8	24.5	13	U	U	U	U	U	U	U	U	U
0020	28.4	29.0	0.0	U	U	U	U	U	U	U	U	U
0021	34.0	34.7	0.0	U	U	U	U	U	U	U	U	U
0022	38.7	39.2	NA	U	U	U	U	U	U	U	U	U
0141	44.0	44.5	NA	U	U	U	U	U	U	U	U	U

SQ SAMPLE RESULTS (1)
OP TANK FARM
May 1995

Borehole 21-3004

May 30-31, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
	0023	3.1		3.7	0.0	U	U	U	U	U	U	
0024	9.1	9.6	0.0	U	U	U	U	U	U	U	U	U
0025	13.8	14.3	0.0	U	U	U	U	U	U	U	U	U
0026	17.0	17.5	0.0	U	U	U	U	U	U	U	U	U
0027	23.5	24.2	0.0	U	U	U	U	U	U	U	U	U
0028	28.7	29.3	0.3	U	U	U	U	U	U	U	U	U
0029	33.9	34.4	0.0	U	U	U	U	U	U	U	U	U
0030	38.5	39.0	NA	U	U	U	U	U	U	U	U	U
0031	42.5	43.0	NA	U	U	U	U	U	U	U	U	U

Borehole 21-3005

May 26, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
	0032	3.8		4.3	0.0	U	U	0.53	0.19	U	U	
0033	8.4	9.2	0.1	U	U	0.61	0.22	U	U	U	0.83	U
0034	13.6	14.1	0.0	U	U	0.65	0.23	U	U	U	0.89	U
0035	18.9	19.3	0.0	U	U	0.65	0.24	U	U	U	0.89	U
0036	22.0	23.0	0.1	U	U	0.70	0.28	U	U	U	0.96	U
0037	22.0	23.0	0.1	U	U	0.70	0.28	U	U	U	0.97	U
0038	29.0	29.5	NA	U	U	0.61	0.23	U	U	U	0.84	U
0039	34.0	34.5	NA	U	U	0.67	0.26	U	U	U	0.93	U

**SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995**

Borehole 21-3008 (Angled at 45 degrees)

May 22-23, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0057	3.0	3.5	53	UJ (7)	U	UJ	UJ	UJ	UJ	UJ	UJ	U
0130	6.2	6.8	1452	UJ	U	UJ	0.45 J	0.13 J	2.6 J	2.7 J	5.88 J	>1500 J
0058	8.8	9.4	1853	U	U	U	U	U	3.40	2.90	6.30	>900 J
0059	13.8	14.2	NA	UJ	U	18.6 J	115 J	75 J	218 J	123 J	549.6 J	>2000 J
0060	18.5	19.1	NA	UJ	U	12.8 J	55 J	34.7 J	101 J	56.2 J	259.7 J	>1200 J
0131	18.5	19.1	NA	UJ	U	9.4 J	52.4 J	31.5 J	91.9 J	52.1 J	237.3 J	>3300 J
0081	24.0	24.5	NA	U	U	6.80	65.20	48.40	181.00	87.30	368.70	>1200 J
0082	29.0	29.5	NA	UJ	U	U	0.71 J	U	2.6 J	1.4 J	4.71 J	U
0063	34.0	34.5	517	U	U	U	U	U	U	U	U	390 J
0064	38.4	39.0	47	U	U	U	U	U	U	U	U	U
0132	43.8	44.2	4.9	U	U	U	U	U	U	U	U	U
0133	49.1	49.6	13	U	U	U	U	U	U	U	U	U

Borehole 21-3009

May 24, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0065	4.3	4.9	290	U	U	U	U	U	U	U	U	1461
0066	8.8	9.3	1098	U	U	U	U	U	U	U	U	1678
0067	14.3	14.6	NA	U	U	U	0.03 J	0.21 J	0.60 J	0.83 J	1.67	2393

**SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995**

Borehole 21-3014

May 31, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0180	3.8	4.5	0.0	U	U	U	U	U	U	U	U	U
0181	8.4	9.0	0.0	U	U	U	U	U	U	U	U	U
0182	13.7	14.4	0.0	U	U	U	U	U	U	U	U	U
0183	18.5	19.2	0.0	U	U	U	U	U	U	U	U	U
0184	18.5	19.2	0.0	U	U	U	U	U	U	U	U	U
0185	21.4	22.0	0.0	U	U	U	U	U	U	U	U	U
0188	29.0	29.5	NA	U	U	U	U	U	U	U	U	U
0189	31.5	32.0	NA	U	U	U	U	U	U	U	U	U

Notes:

- | | |
|--|---|
| (1) All data is validated. | (5) J-Estimated quantiles |
| (2) ppm - parts per million | (6) NA - Not analyzed |
| (3) MEK - Methyl Ethyl Ketone | (7) U.I - Not detected, but qualified as an estimate. |
| (4) U - Not detected above the MCAL detection limit. | |

Note 1 - MCAL detection limits are as follows:

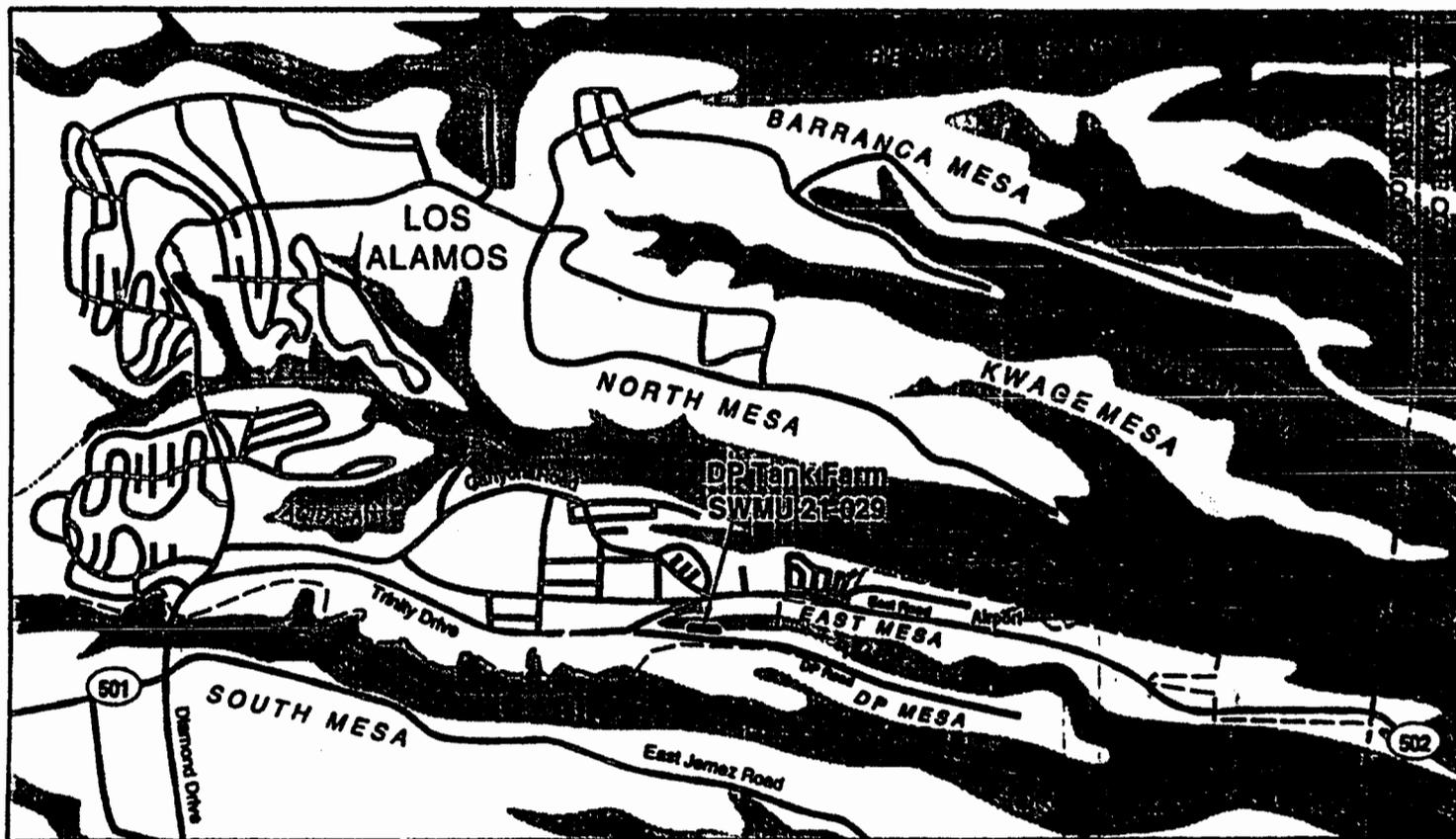
Acetone: 0.2 ppm
 MEK: 0.2 ppm
 Benzene: 0.05 ppm
 Toluene: 0.05 ppm
 Ethylbenzene: 0.05 ppm
 Xylenes: 0.05 ppm
 TPH: 50 ppm

Note 2 - For investigation purposes, the UST action level for total BTEX is 100 ppm. For remediation purposes, UST action levels are 50 ppm for total BTEX and 10 ppm for benzene, or 100 ppm for TPH. These remediation action levels are used at sites contaminated with "highly contaminated" or saturated soils that are 50 feet or less above the seasonal high groundwater level.

7.3

Figures

- Figure 1 General Location of DP Tank Farm, SWMU 21-029
- Figure 2 Locations of structures at DP Tank Farm, SWMU 21-029
- Figure 3 Locations of samples collected during the 1994 investigation of DP Tank Farm, SWMU 21-029
- Figure 4 Locations of samples collected during the 1995 investigation of DP Tank Farm, SWMU 21-029
- Figure 5 DP Tank Farm East Fill Station BTEX data by borehole
- Figure 6 DP Tank Farm East Fill Station TPH data by borehole
- Figure 7 DP Tank Farm West Fill Station BTEX data by borehole
- Figure 8 DP Tank Farm West Fill Station TPH data by borehole
- Figure 9 DP Tank Farm TPH data summary
- Figure 10 DP Tank Farm BTEX data summary



aeriteography by A. Ron 8/14/83

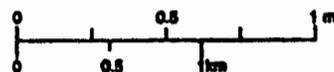
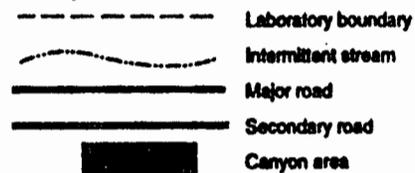


Fig. 1. General location of DP Tank Farm, SWMU 21-029.

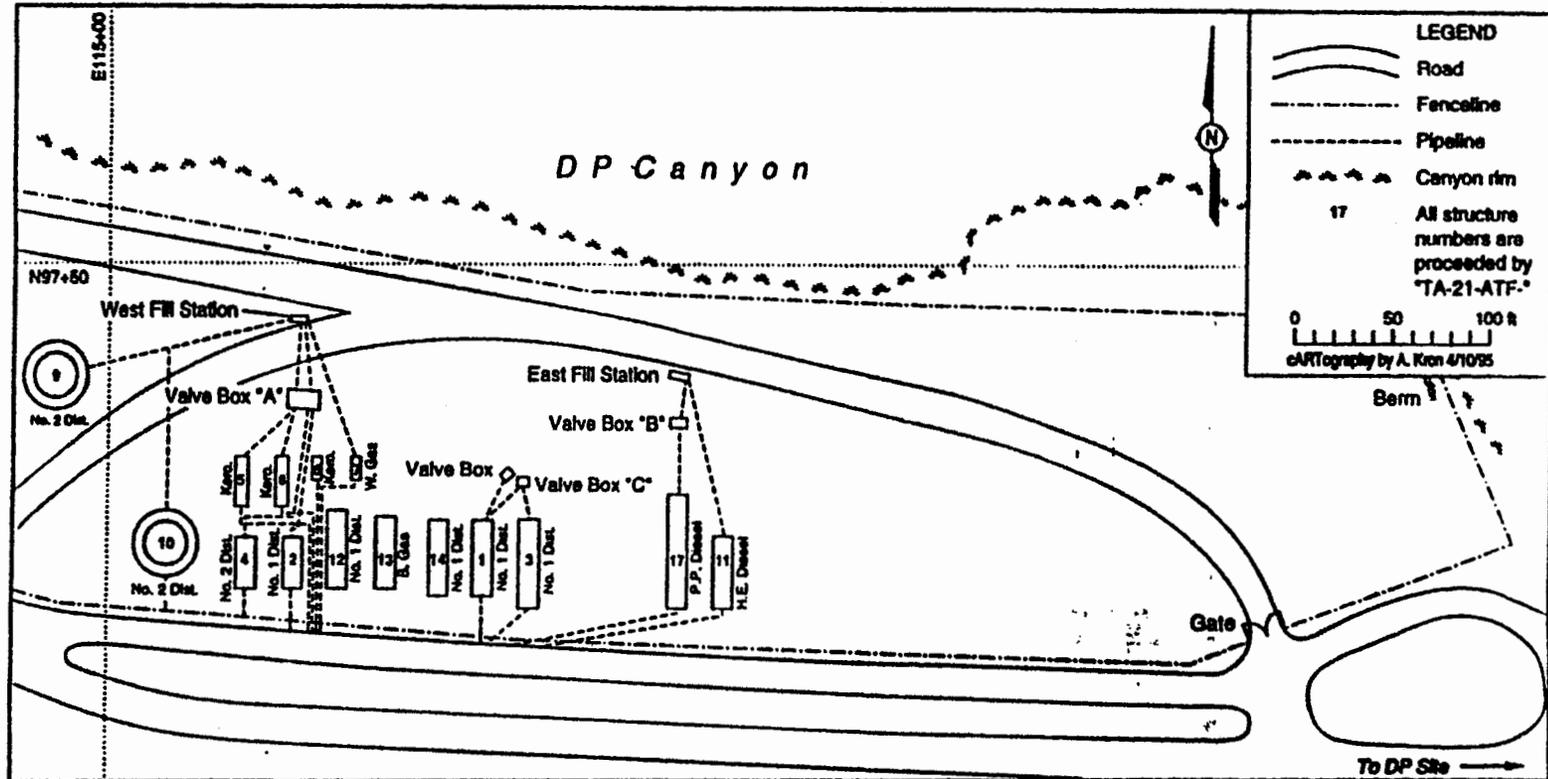


Fig. 2. Locations of structures at DP Tank Farm, SWMU 21-029.

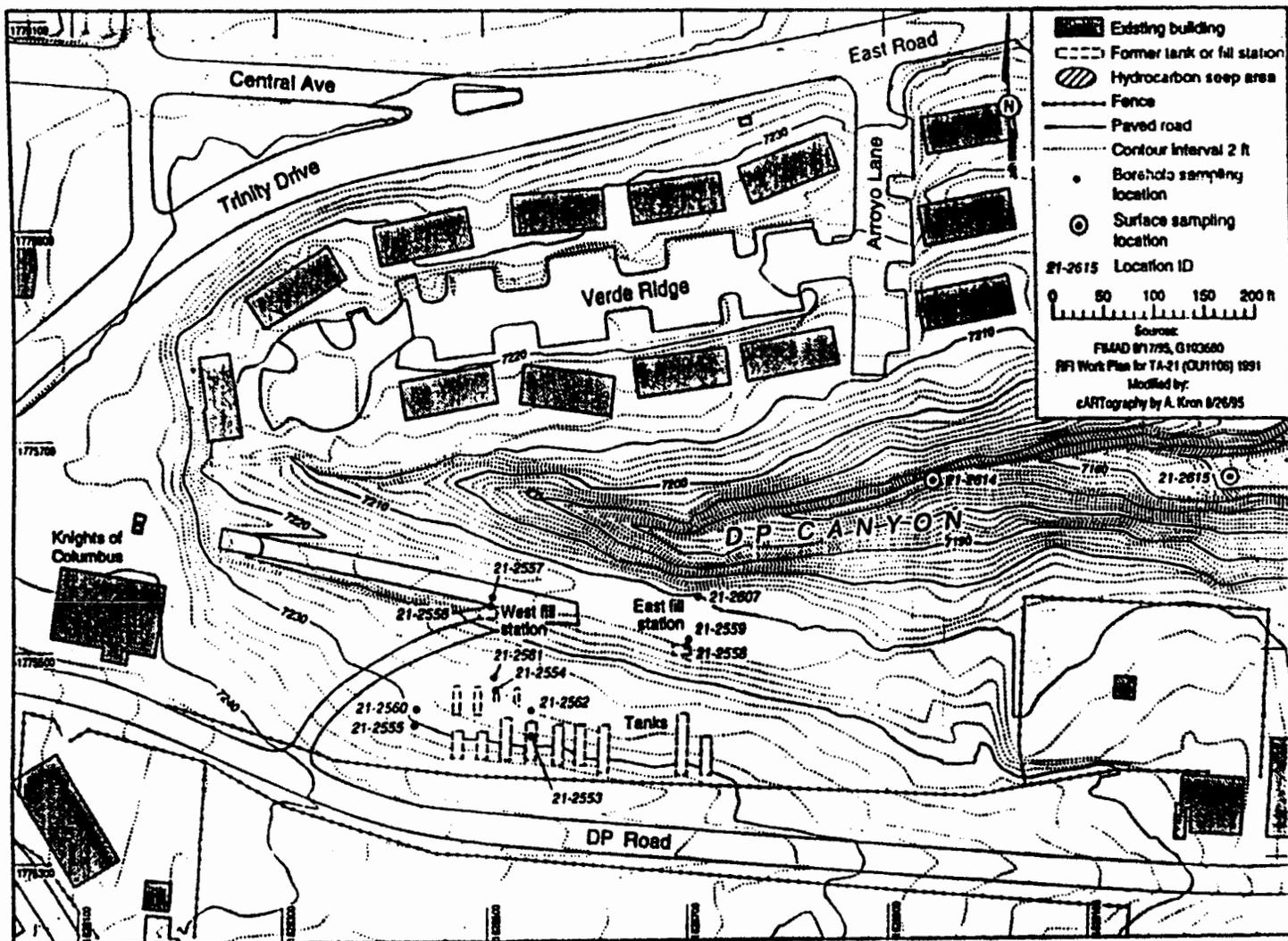


Fig. 3. Locations of samples collected during the 1994 investigation of DP Tank Farm, SWMU 21-029.

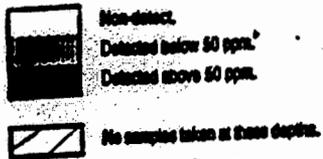
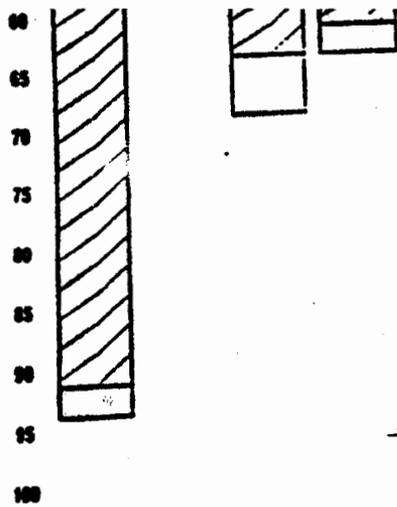


Fig. 5 DP Tank Farm East Fill Station BTEX data by boreholes.

TABLE 4-6

CONCENTRATIONS GREATER THAN UST REGULATORY THRESHOLDS
AT THE WEST FILL STATION

ANALYTE	LOCATION ID	SAMPLE ID	SAMPLE VALUE	REGULATORY LIMIT	DEPTH (ft)
TPH	21-3003	0121-95-0017	> 600	100	13.5 - 14.3
	21-3003	0121-95-0018	> 670		18.5 - 19.2

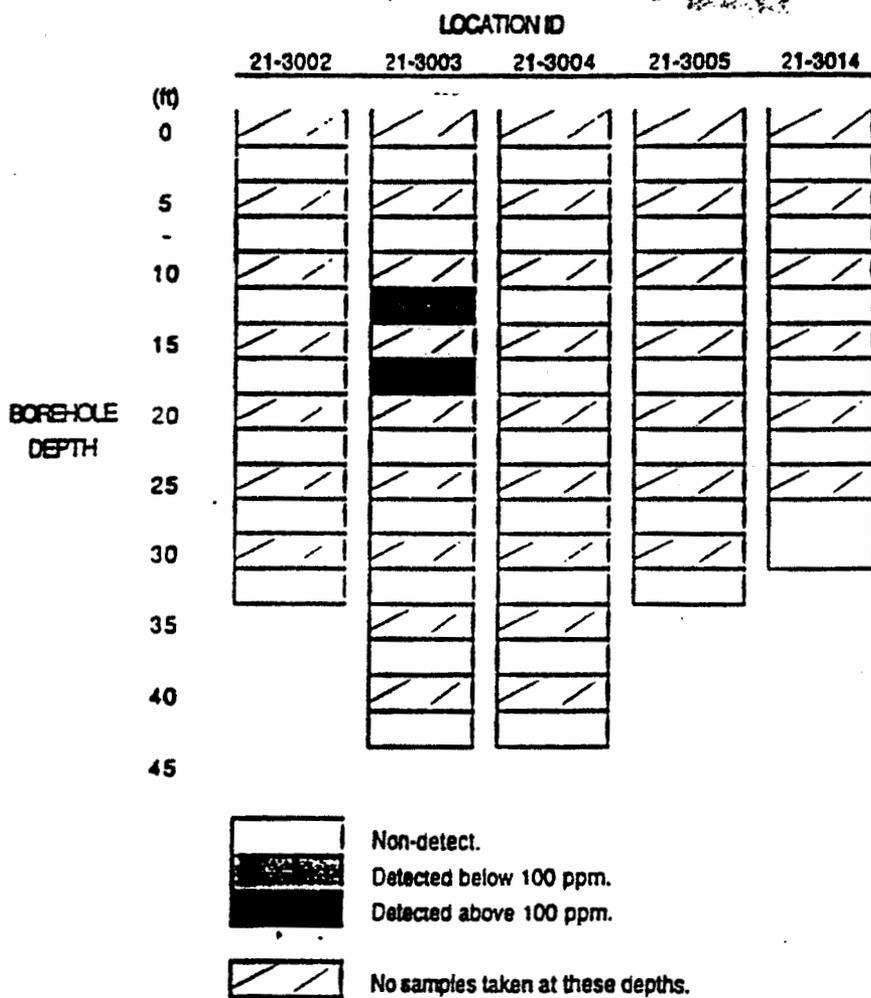


Fig. 8 DP Tank Farm West Fill Station TPH data by boreholes.

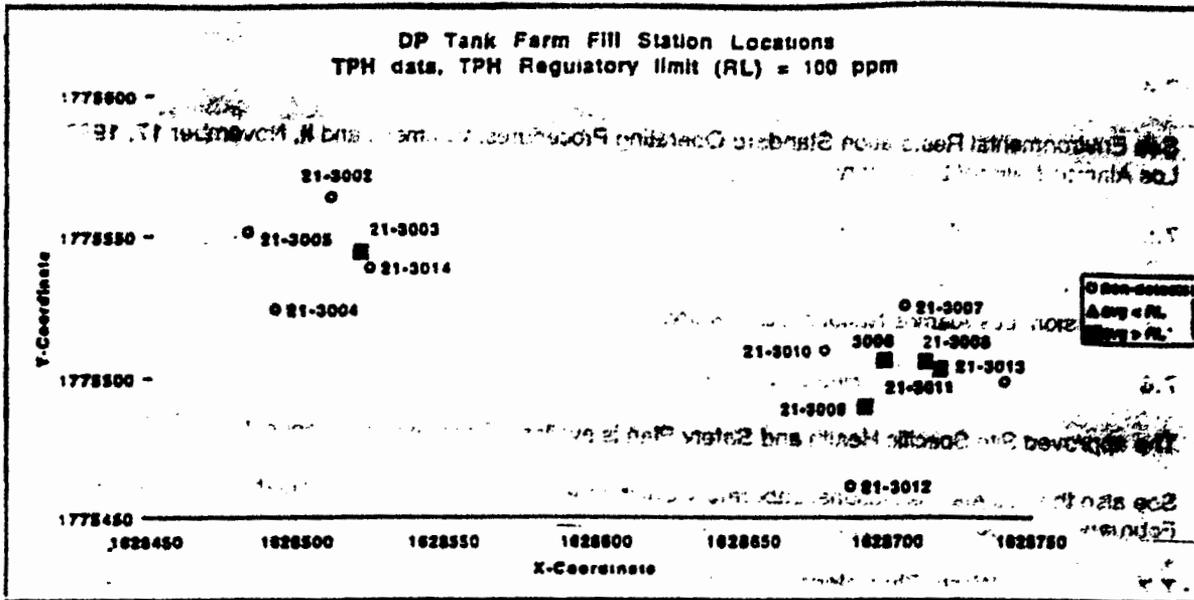


Fig. 9 DP Tank Farm TPH data summary.

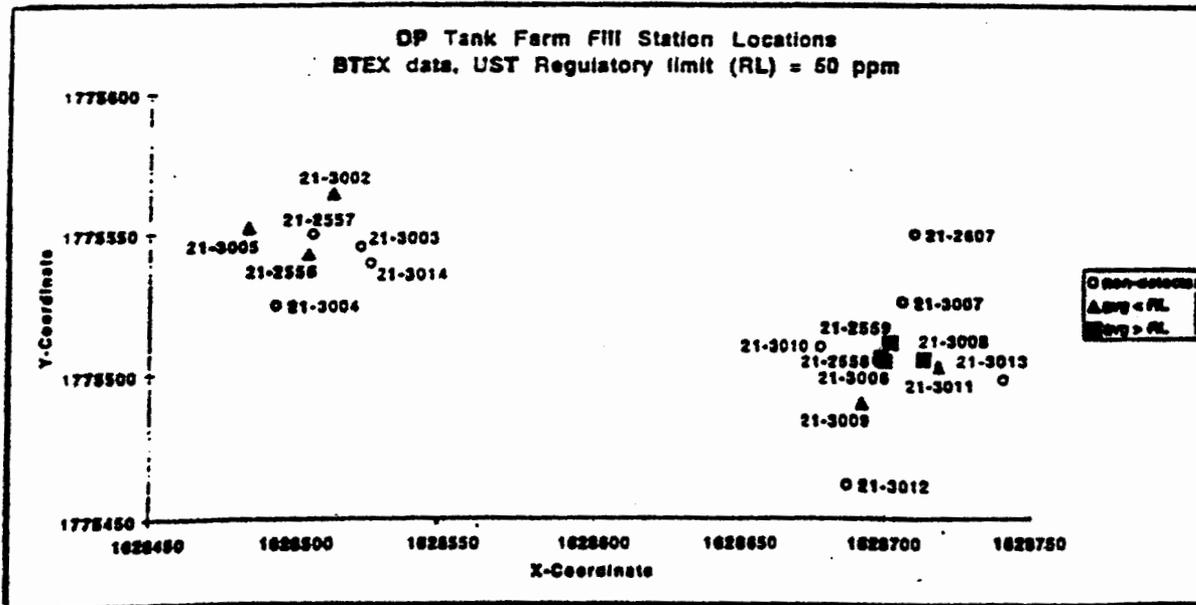


Fig. 10 DP Tank Farm BTEX data summary.

7.4 Implementation SOPs

See Environmental Restoration Standard Operating Procedures, Volumes I and II, November 17, 1993, Los Alamos National Laboratory.

7.5 Quality Assurance Plan

See Quality Program Plan and Quality Assurance Project Plan for Environmental Restoration, February 1995 revision, Los Alamos National Laboratory.

7.6 Site Specific Health and Safety Plan

The approved Site Specific Health and Safety Plan is available for review upon request.

See also the Los Alamos National Laboratory Environmental Restoration Project Health and Safety Plan, February 11, 1995, Los Alamos National Laboratory.

7.7 Waste Characterization Strategy

The approved Site Specific Waste Characterization Strategy is available for review upon request.

7.8 Field Work Authorization Form

The Voluntary Corrective Action Checklist and Fieldwork Authorization Form is located on the following page.

7.9 Cost Estimate

Total anticipated costs for PRS 21-029 is \$271,789.

Pre-Field Activities	\$29,665
Field Activities	\$191,811
Analytical Costs	\$27,756
Waste Management	\$1,703
Post-Field Activities	\$20,854
TOTAL ESTIMATED COST	<u>\$271,789</u>

**Voluntary Corrective Action (VCA)
Checklist and Fieldwork Authorization Form**

PRS No. 21-029
(CDP Tank Farm)

HSWA or AOC

- PCOC(s) defined.
- Nature and extent defined or field screening method available to guide where not defined.
- Remedy is obvious.
- Time for removal is less than 6 months.
- Remedy is final.
- Land use assumptions straightforward.
- Treatment, Storage, Disposal Facilities are available for waste type and volume.
- Cleanup cost is reasonable for the planned action, and meets accelerated decision logic criterion for decision to proceed with VCA.

Explain criteria not checked above. _____

Through reviewing the above criteria associated with this site, I believe that a VCA is the appropriate Accelerated Cleanup approach.

FPL *J. Allen*

Date 13 March 96

FPC *A. Koch*

Date 13 March 96

CDP Tank Farm

Through reviewing the VCA Plan, for site 21-029, and believing that the above criteria have been met, I authorize the fieldwork to proceed.

DOE ER Program Manager *J. J. G. L.*

Date 4/8/96