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FINAL
PHASE I
CONTAMINATION ASSESSMENT REPORT
SITE 1-7
HYDRAZINE BLENDING AND STORAGE FACILITY
VERSION 3.2

September 1988
Contract No. DAAK11-84-D-0017

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ROCKY MOUNTAIN ARSENAL

2

FINAL
PHASE I
CONTAMINATION ASSESSMENT REPORT
SITE 1-7
HYDRAZINE BLENDING AND STORAGE FACILITY
VERSION 3.2

September 1988
Contract No. DAAK11-84-D-0017
TASK NO. 11

Prepared by:

EBASCO SERVICES INCORPORATED
R.L. STOLLAR AND ASSOCIATES
CALIFORNIA ANALYTICAL LABORATORIES, INC.
DATACHEM, INC. GERAGHTY & MILLER, INC.

Prepared for:

U.S. ARMY PROGRAM MANAGER'S OFFICE FOR
ROCKY MOUNTAIN ARSENAL CONTAMINATION CLEANUP

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REPORT DOCUMENTATION PAGE

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13. ABSTRACT (Maximum 200 words) THIS FINAL REPORT DOCUMENTS THE PHASE I CONTAMINATION SURVEY OF SITE 1-7, THE HYDRAZINE BLENDING AND STORAGE FACILITY CONSTRUCTED IN 1960 FOR THE AIR FORCE. 54 SAMPLES FROM 15 BORINGS WERE ANALYZED FOR VOLATILE AND SEMIVOLATILE ORGANICS AND METALS WITH SEPARATE ANALYSES FOR AS, HG, DBCP, HYDRAZINES, AND NITROSAMINES. MIBK, DLDNR, CD, CR, CU, PB, ZN, AND AS WERE DETECTED WITHIN OR ABOVE THEIR RESPECTIVE INDICATOR RANGES; HOWEVER, THE CONCENTRATIONS OF CU, PB, ZN, AND AS APPEARED TO BE NATURALLY OCCURRING LEVELS. BTZ WAS ALSO TENTATIVELY IDENTIFIED IN 1 BORING. A PHASE II PROGRAM CONSISTING OF 37 ADDITIONAL BORINGS IS RECOMMENDED. THE VOLUME OF POTENTIALLY CONTAMINATED SOIL PRESENT IS ESTIMATED AT 190,000 CUBIC YARDS. APPENDICES: CHEMICAL NAMES, PHASE I CHEMICAL DATA, COMMENTS AND RESPONSES.					
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EXECUTIVE SUMMARY

SITE 1-7

HYDRAZINE BLENDING AND STORAGE FACILITY

Site 1-7, the hydrazine blending and storage facility, is located in the northern half of the northeastern quarter of Section 1 on the Rocky Mountain Arsenal. The facility was constructed in 1960 on the western end of a large open storage area that was used as early as 1945. This site was investigated under Task 11 in the spring of 1986. A total of 15 borings, yielding 54 samples, were drilled to depths ranging from 5 to 40 feet.

Methylisobutyl ketone, dieldrin, cadmium, chromium, copper, lead, zinc, and arsenic were detected within or above their indicator levels in the soil samples. Methylisobutyl ketone and dieldrin occurred in only one sample each, and are believed to be limited in extent. Copper, lead, zinc, and arsenic were found at somewhat elevated concentrations in some alluvial samples, but are considered to be at natural levels in the bedrock at this site. Several nontarget compounds were tentatively identified at elevated concentrations. These included organic esters and acids, plasticizers, and fuel or oil related products. Benzothiazole was tentatively identified in one boring.

The Phase I field program was adequate to delineate a worst-case volume of potentially contaminated soil at Site 1-7, but Phase II field investigations are proposed to occur during remediation of the site. This program will investigate the potential target and nontarget contamination observed in the Phase I program. This portion of the Phase II program will involve the completion of 22 additional borings, producing 56 soil samples. Five samples from these borings and 45 samples from 15 other borings are tentatively proposed to further investigate the presence of hydrazines and nitrosamines in areas adjacent to certain structures at this site. The volume of potentially contaminated soil, previously estimated at 77,000 cubic yards, has been revised to 190,000 cubic yards.

PHASE I CONTAMINATION ASSESSMENT REPORT

SITE 1-7

HYDRAZINE BLENDING AND STORAGE FACILITY

1.0 PHYSICAL SETTING

1.1 LOCATION

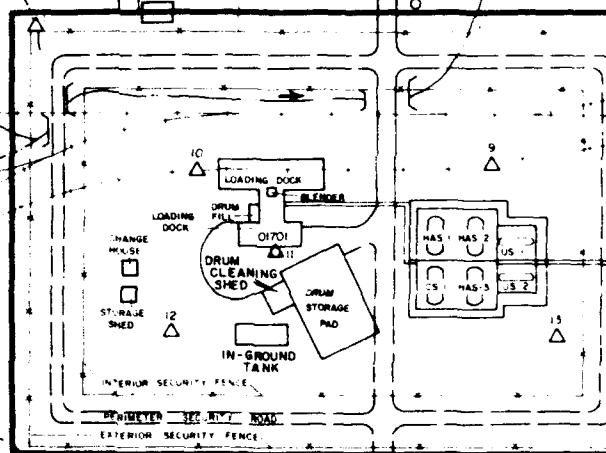
Site 1-7, the hydrazine blending and storage facility (HBSF), is located in the northern half of the northeastern quarter of Section 1, east of the South Plants manufacturing complex on the Rocky Mountain Arsenal (RMA) (Figure 1-7-1). The HBSF consists of two discrete yards, each surrounded by a chain link security fence and a barbed wire fence. These fenced areas are 450 feet (ft) apart, but the yards are connected by two overhead pipelines. The west yard encompasses 346,000 square feet (ft^2), and the east yard encompasses 103,000 ft^2 . Site 1-7 is a rectangle approximately 1,670 ft by 570 ft, and encompasses approximately 950,000 ft^2 of area as shown in Figure 1-7-1. The west yard contains the loading docks for rail cars and tank trucks, the blender, a 50,000 gallon capacity in-ground concrete tank for the collection of wastewater and local runoff, a drum filling station, a drum storage pad, a storage and tool shed, and bulk storage tanks. The east yard was constructed to provide additional storage for unsymmetrical dimethyl hydrazine in two additional tanks, but is currently used to store precipitation runoff and wastewater from previous HBSF operations. Figure 1-7-2 shows the layout of Site 1-7, including underground piping. Site 1-7 was investigated under Task 11 in the spring of 1986.

1.2 GEOLOGY

The two uppermost stratigraphic units beneath Site 1-7 are Quaternary alluvium and the Denver Formation bedrock (May, 1982/RIC 82295R01). Phase I borings in the area indicate that the alluvial thickness ranges from approximately 5 to 15 ft. The alluvium at Site 1-7 generally consists of silt and sand mixtures with clay and minor amounts of gravel. Representative boring profiles for two of the deeper borings, Borings 11 and 14, are shown in Figures 1-7-3a and 1-7-3b, respectively.

DECEMBER SEVENTH AVENUE

Ditch DIOB



01030
01031
01032
O

01004
O

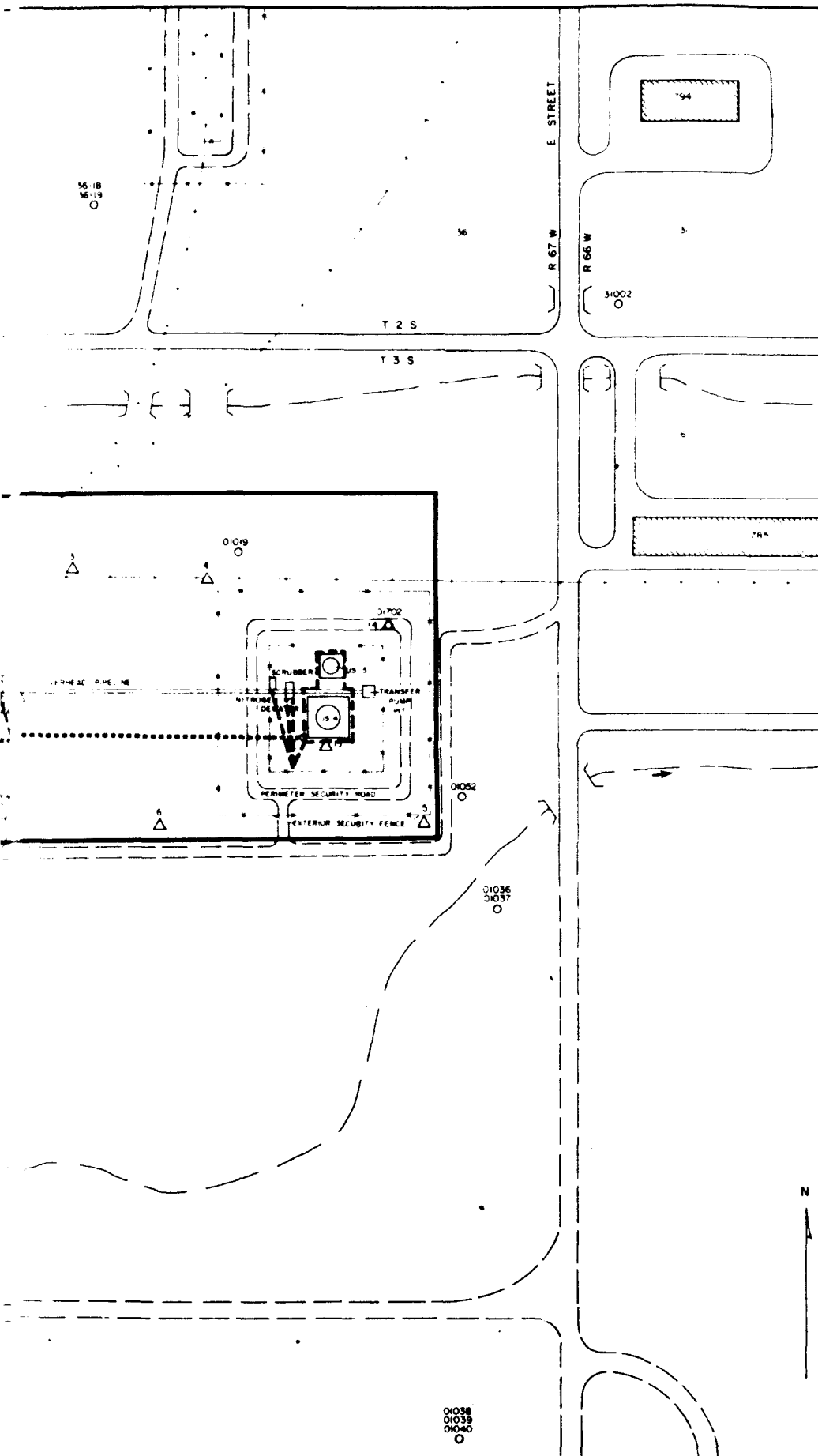
01051
O

01051
O

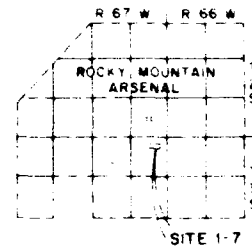
01008
O

36075
O

3615
3612
O



LEGEND



LEGEND

- WATER PIPES (COE 1978, SHEET NO 36)
- UNDERGROUND SEWERS/SEPTIC SYSTEM (COE 1978, SHEET NO 37)
- CHEMICAL SEWER (COE 1978, SHEET NO 38)
- UNDERGROUND WIRING (DEPT OF ARMY, E4-72-4, DEPT OF ARMY E4-72-8, COE AW-78-14-01-SHEET 17)
- DRILLED SOIL BURNING
- EXISTING MONITORING WELL
- DRILLED SOIL BURNING LAYOUTED AS A MONITORING WELL
- DRAINAGE CHANNELS (COE 1978 SHEET NO 20)
- DRAINAGE DIRECTION
- CULVERT
- PAVED ROADS
- UNPAVED ROADS
- RAILROAD
- SECURITY FENCE
- SITE BOUNDARY



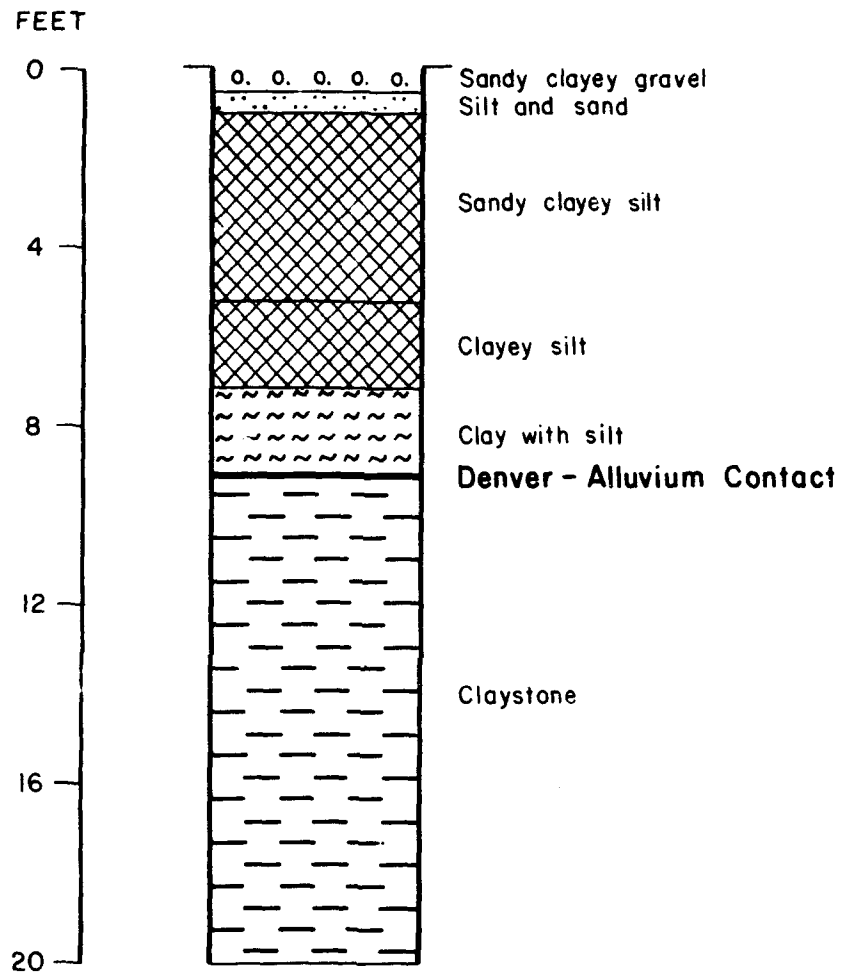
Figure 1-7-2 LOCATION MAP SHOWING SCHEMATIC LAYOUT-HYDRAZINE BLENDING AND STORAGE FACILITY

SITE 1-7

Rocky Mountain Arsenal, Task 11
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for Ebasco Services, Inc.

Prepared For:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland



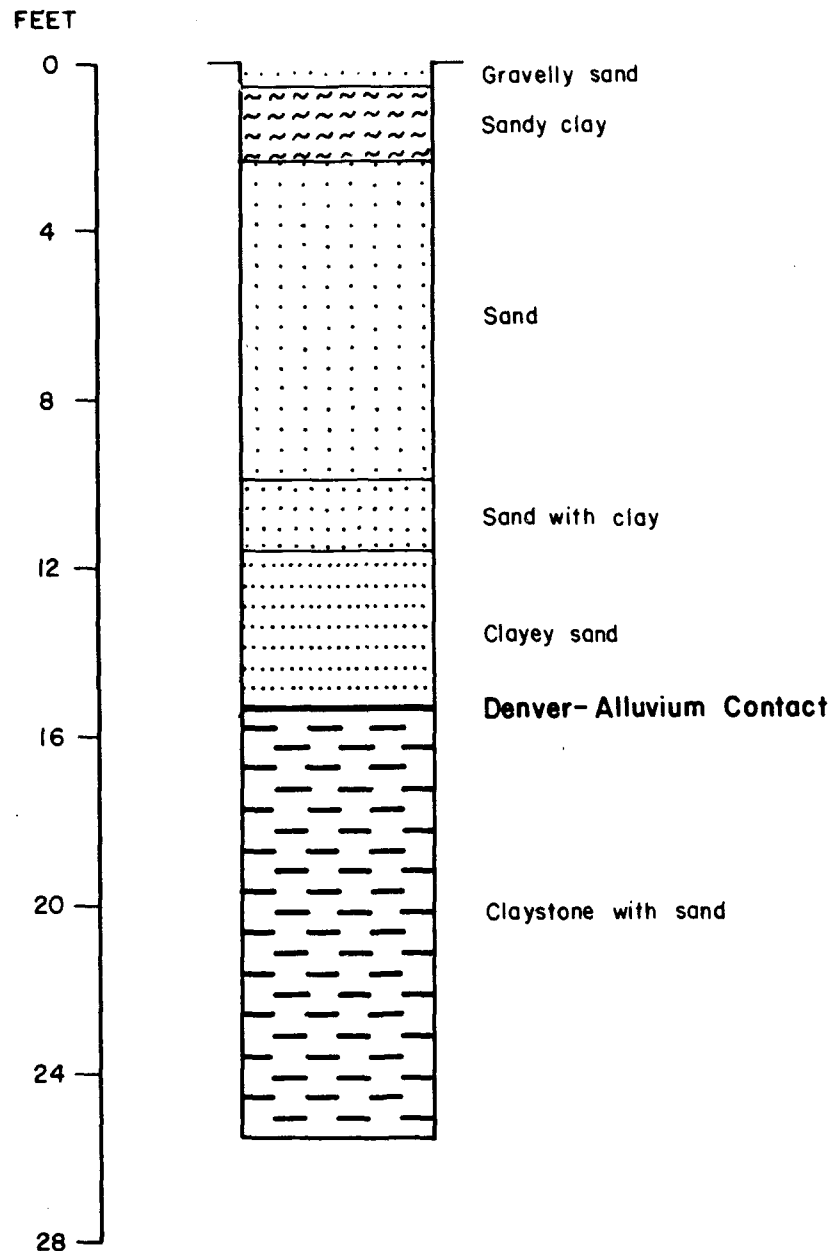
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**FIGURE I-7-3a
Field Boring Profile
for Boring II**

Rocky Mountain Arsenal, Task II

Prepared by: Ebasco Services Incorporated



Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

FIGURE I-7-3b

**Field Boring Profile
for Boring 14**

Rocky Mountain Arsenal, Task II

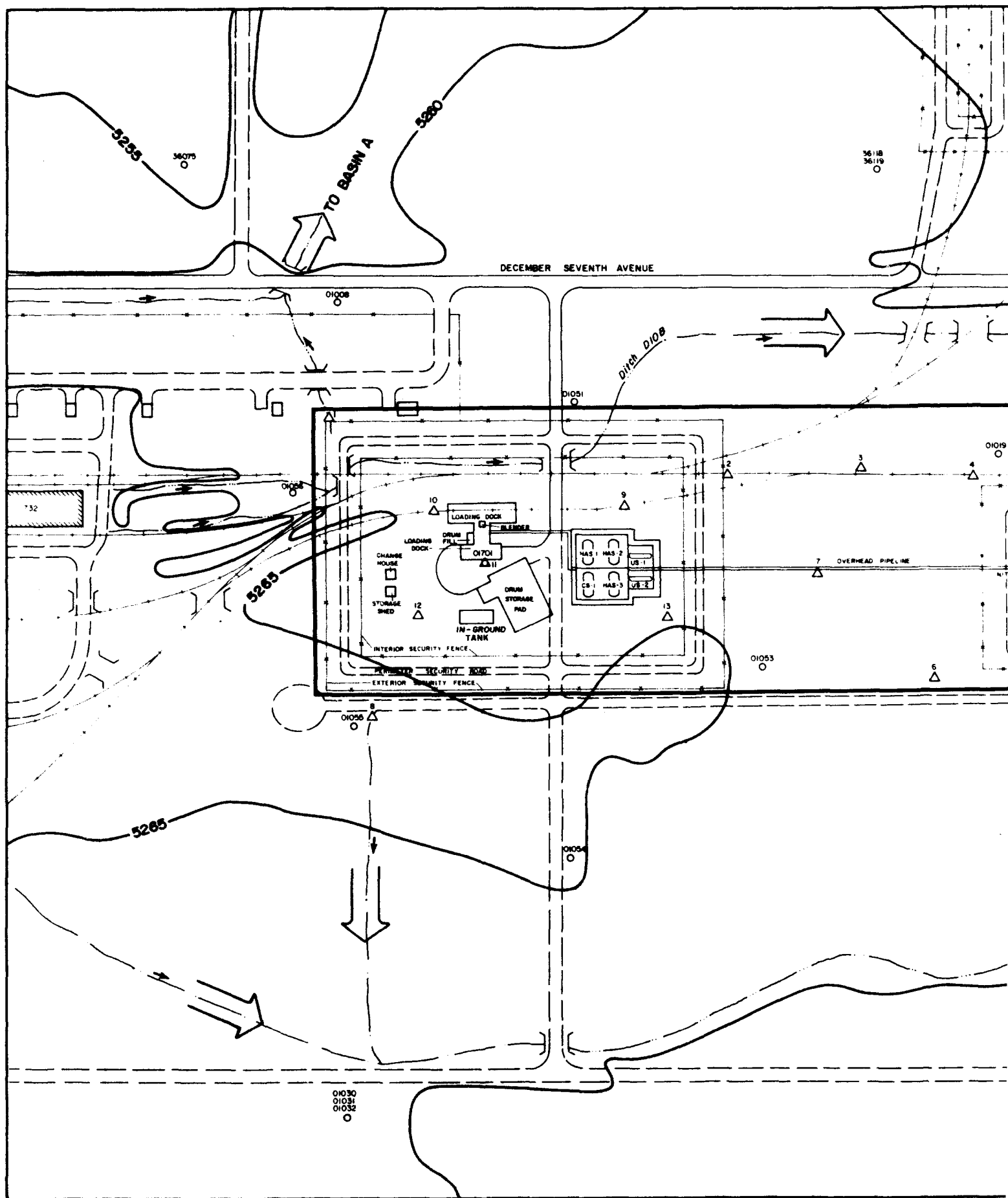
Prepared by: Ebasco Services Incorporated

The underlying Denver Formation consists mainly of interbedded claystone, sandstone, and sandy claystone with lignite and volcanoclastic sandstone. As borings drilled in the area of Site 1-7 do not penetrate the Denver Formation completely, the total thickness of the unit beneath the site is unknown. Borings 11 and 14 (Figures 1-7-3a and 6) penetrated approximately 11 ft of Denver Formation composed primarily of claystone. These and other boring and well data indicated no major Denver sandstone bodies beneath Site 1-7 and no paleochannels or other features of note at the bedrock surface. A detailed description of the Denver Formation is found in a study by May (1982/RIC 82295R01).

1.3 HYDROLOGY

The average elevation of Site 1-7 is 5,263 ft above mean sea level (msl), with a local relief of approximately 5 ft (Figure 1-7-4). Surface drainages within Site 1-7 are indefinite because of the relatively uniform terrain, and drainage may be impeded by railroad embankments and access roads. An east-west trending ditch located in the northern part of the west yard drains eastward through the yard and eventually northward to the First Creek drainage basin in Section 31. In the southwest part of the yard a north-south trending ditch drains southward, eventually joining an easterly flowing ditch that drains to First Creek in Section 6. Another north-south trending ditch leaves the northwest corner of the HBSF west yard and drains northward to Basin A. Surface water drainage from the east yard is probably contained by a berm which partially surrounds it. No surface water quality data are available for the HBSF.

The HBSF is on the eastern edge of the South Plants groundwater mound. The primary groundwater flow direction under the site is north and northeast toward First Creek (Figure 1-7-5). The depth to groundwater was measured in February and May 1986 in 13 wells located in and around the HBSF, and values ranged from 8.9 to 17.6 ft below the surface (5247.4 to 5244.1 ft msl) (Table 1-7-1). Because of a bedrock high in this area, the alluvium is relatively thin, and the water table is found in the Denver Formation at this site.



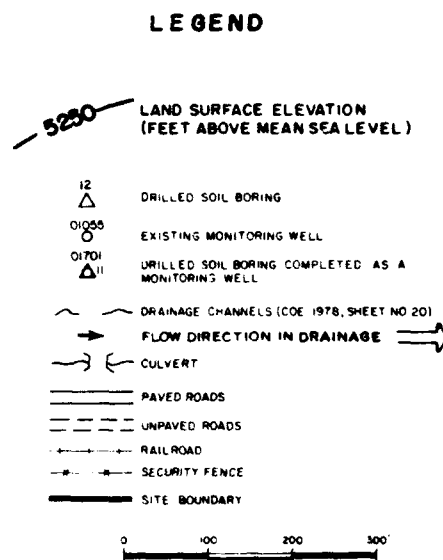
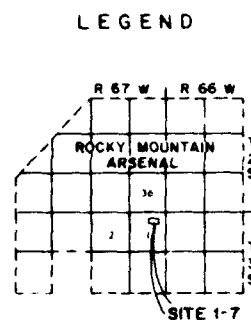
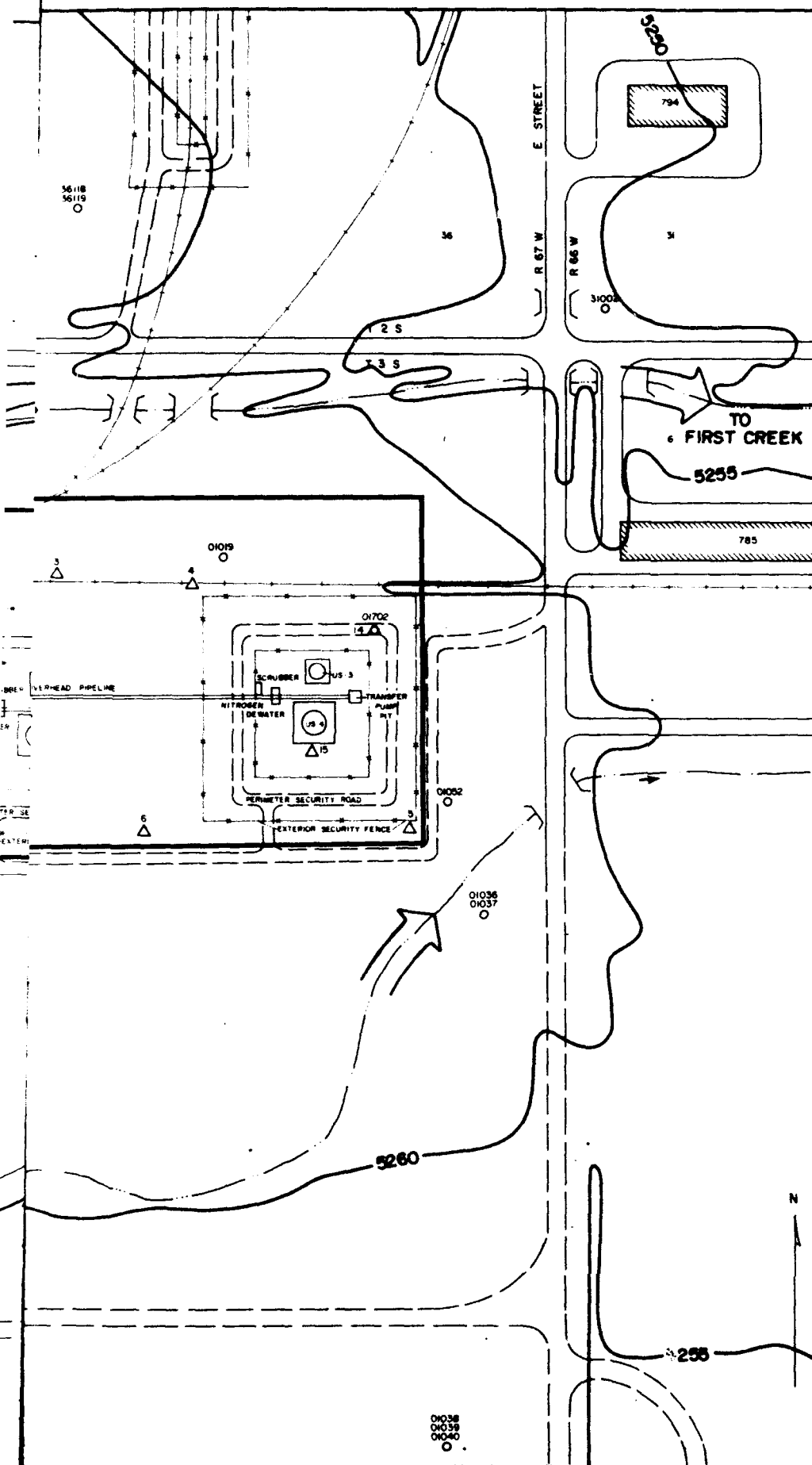


Figure 1-7-4

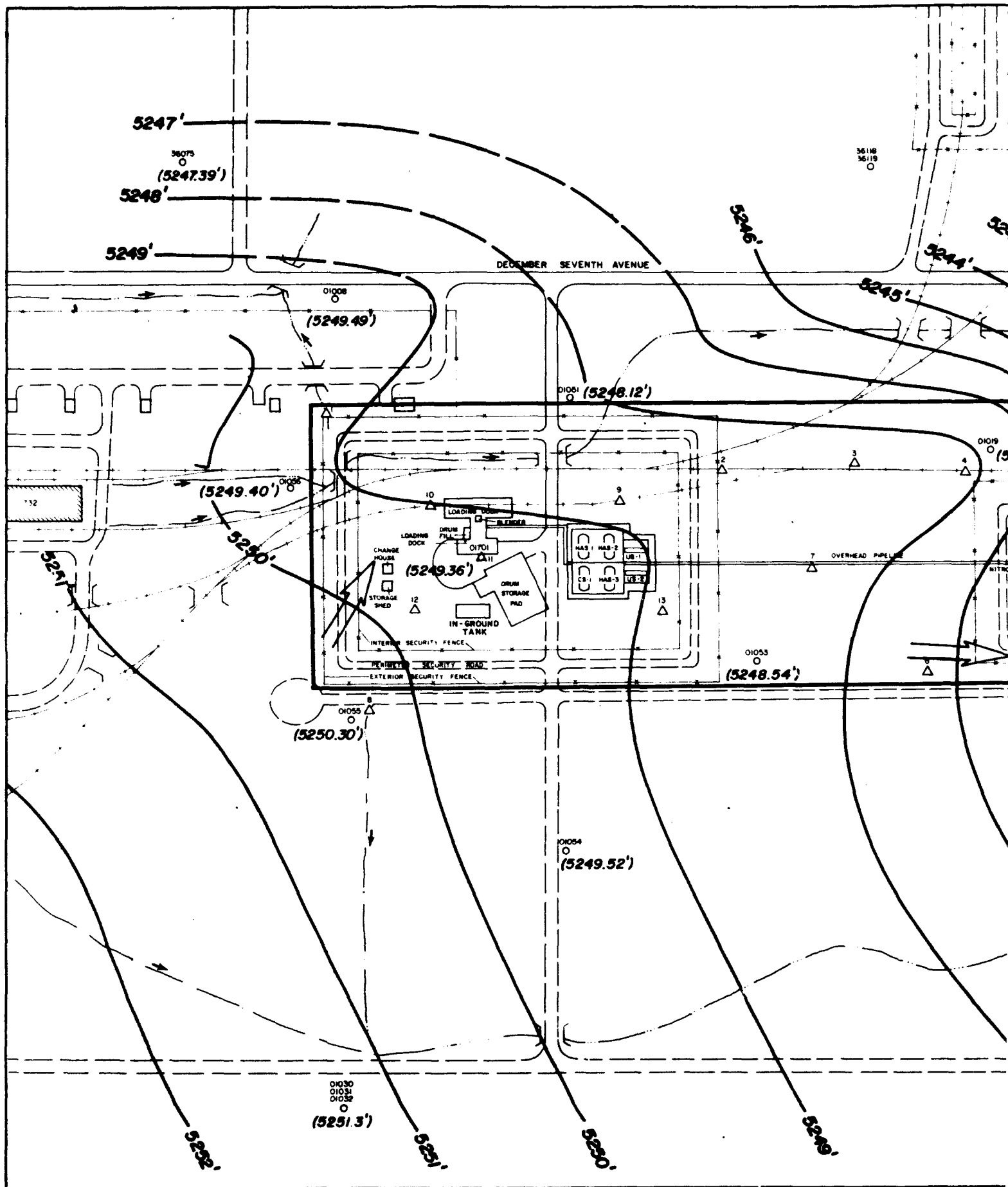
TOPOGRAPHY AND SURFACE DRAINAGE

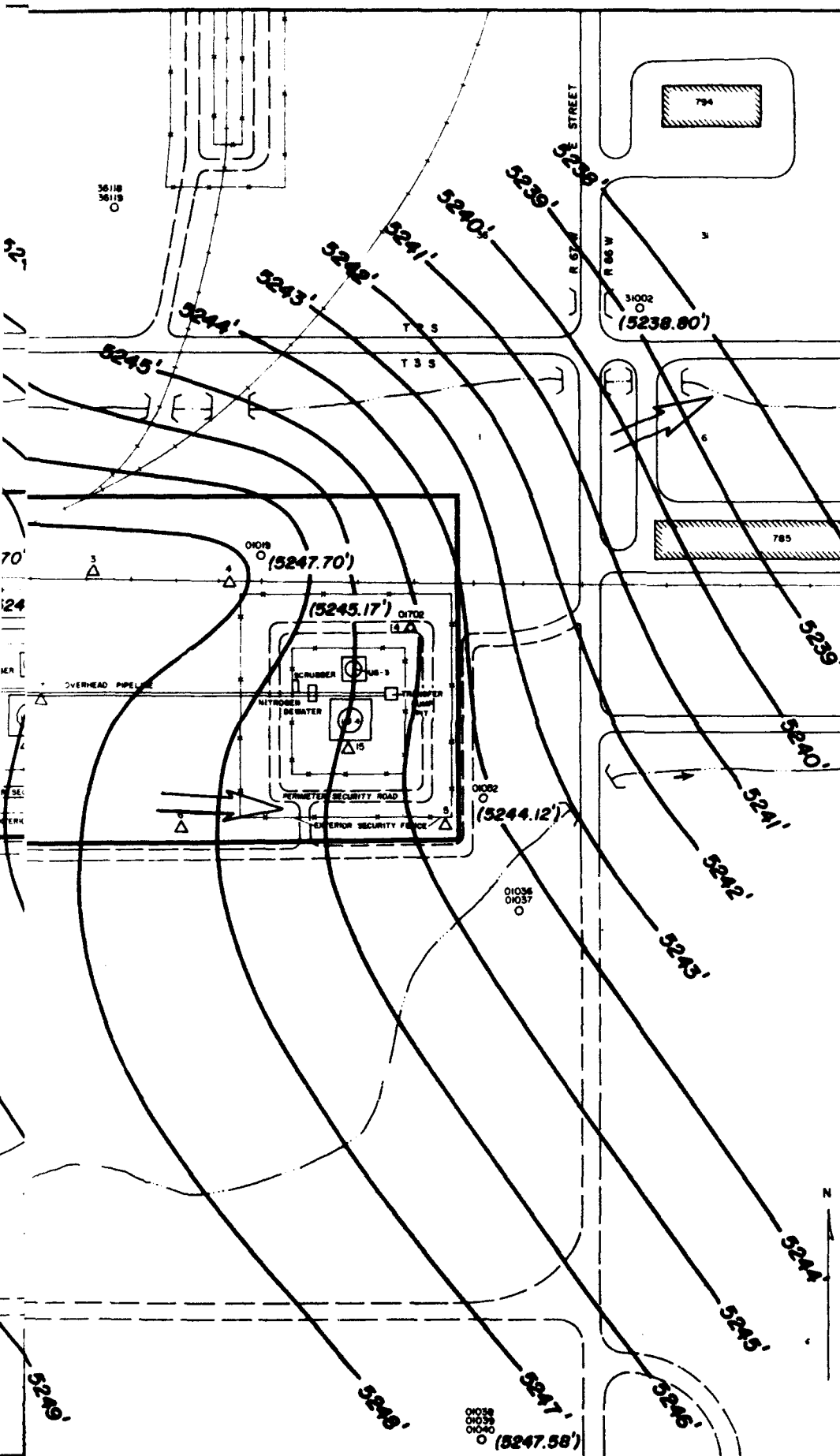
SITE 1-7

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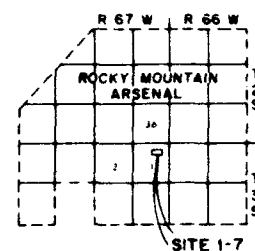
Prepared For:

**Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland**





LEGEND



LEGEND

- 01019
(5247.70') WATER ELEVATION IN WELL
- 5240' --- CONTOUR DASHED WHERE APPROXIMATE
CONTOUR INTERVAL = 1 FOOT
- GENERALIZED GROUND WATER
FLOW DIRECTION
- 12
△ DRILLED SOIL BORING
- 01055
○ EXISTING MONITORING WELL
- 01701
△ DRILLED SOIL BORING COMPLETED AS A
MONITORING WELL
- DRAINAGE CHANNELS (COE 1978, SHEET NO 20)
- DRAINAGE DIRECTION
- CULVERT
- PAVED ROADS
- UNPAVED ROADS
- RAILROAD
- SECURITY FENCE
- SITE BOUNDARY

Figure I-7-5

WATER TABLE ELEVATIONS and GENERALIZED GROUNDWATER FLOW DIRECTION

(MEASURED ON 5-14-86)

SITE I-7

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for Ebasco Services, Inc.

Prepared For:

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Aberdeen Proving Ground, Maryland

8

Table 1-7-1. Water Level Measurements.

	28 February 1985			14 May 1986	
Well #	Measuring Point Elevation ¹ (ft msl)	Depth to Water (ft)	Water Elevation (ft msl)	Depth to Water (ft)	Water Elevation (ft msl)
01008	5,262.78	15.65	5,247.13	13.29	5,249.49
01019	5,265.79	21.21	5,244.58	18.09	5,247.70
01036	5,259.83	16.79	5,243.04	15.28	5,244.55
01051	5,263.70	18.33	5,245.37	15.58	5,248.12
01052	5,261.48	18.85	5,242.63	17.36	5,244.12
01053	5,266.03	20.11	5,245.98	17.55	5,248.54
01054	5,265.60	17.28	5,248.32	16.08	5,249.52
01055	5,267.15	18.83	5,248.16	16.85	5,250.30
01056	5,265.50	18.51	5,246.99	16.10	5,249.40
01701	5,264.00	— ²	— ²	14.87	5,249.36
01702	5,262.04	— ²	— ²	16.87	5,245.17
31002	5,254.24	17.7	5,236.54	15.44	5,238.80
36075	5,256.33	9.97	5,246.36	8.94	5,247.39

¹ The measuring point for each well is the top of the well casing

² Well not installed at the time of the measuring round

The water table surface around and below Site 1-7 may be somewhat irregular when viewed at the level of detail given by the 1 ft contour interval shown in Figure 1-7-5. However, this irregularity is best explained as an artificial effect caused by different surveying or construction techniques that may have been used in installing Wells 01051 through 01056 compared to other wells in the area, because contouring data separately from these two groups of wells completely eliminates the irregularity. Other possible causes are local sources of recharge and changing aquifer properties in the area, but the known features that could be local sources of recharge would not be expected to produce the pattern seen in Figure 1-7-5, and none of the geological data from the site support a change in aquifer properties.

In groundwater samples collected from the vicinity of Site 1-7 in 1985 and 1986, the following analytes were detected (ESE, 1987):

	<u>Upgradient Wells</u>	<u>Crossgradient Wells</u>	<u>Wells in and Downgradient from Site 1-7</u>
1,1-Dichloroethylene			01051, 01701
1,2-Dichloroethylene	01054		
1,1,1-Trichloroethane			01701
1,1,2-Trichloroethane	01054, 01055		
Benzene			01019
Carbon tetrachloride	01054, 01055, 01056	01008	
Chloroform	01054, 01055, 01056	01008, 01036	01051, 01052, 01053, 01701, 01702
Dibromochloropropane	01054, 01055	01036	
Dieldrin		01008	
Trichloroethylene	01054, 01055, 01056	01008	01051, 01053, 01701

As most of these compounds were found in upgradient wells and are typical of the compounds found in the groundwater beneath the South Plants manufacturing complex, their presence in groundwater beneath the HBSF does not necessarily imply that the HBSF is contributing these chemicals to the groundwater.

Groundwater samples from wells in and near the site (01008, 01019, 01036, 01051-01056, 01701, 01702, and 36075) were collected in 1986 and analyzed for hydrazines; four of these wells were also analyzed for nitrosamines.

Hydrazines were reported in all samples from upgradient, crossgradient, and downgradient wells, and a nitrosamine was reported only in upgradient Well 01055. Because these compounds were found in the blanks associated with the samples and in upgradient and crossgradient wells where no potential source for them is known, these results cast doubt on the reliability of the spectrophotometric analytical methods used on the samples. A more reliable gas chromatographic (GC) analytical method was subsequently devised and USATHAMA certified, and the same wells, plus an additional downgradient well (31002) were sampled in 1988 and analyzed using the new GC methods. No hydrazines or nitrosamines were detected by GC in any of the 1988 samples. These later results tend to confirm the unreliability of the spectrophotometric methods, which are certified as adequate to detect hydrazines and nitrosamines when they are present, but can also produce false positive results. The 1988 samples show that Site 1-7 is not contributing detectable concentrations of these compounds to the groundwater sampled in these wells.

2.0 HISTORY

Information on the history of Site 1-7 was gathered through a review of aerial photographs and a search of the literature and of the Shell I, Shell II, and Juris Computer Databases. Based on a review of these data, Site 1-7 has been identified as the Hydrazine Blending and Storage Facility.

Aerial photographs of Section 1 taken between 1943 and 1982 revealed the following information pertinent to Site 1-7. These descriptions are interpretations of photographs published in a report by Stout and Abbott (1982/RIC 83368R01) unless otherwise noted.

Photo Date

Site Description

1943

No sign of activity is visible at Site 1-7. East-west railroad tracks create the northern boundary of the site. A north-south trending ditch crosses the site, enters a culvert beneath December 7th Avenue, and enters Section 36 (RMA, 1945a).

1945

The upper two-thirds of Site 1-7 and the area north of the railroad tracks has been cleared of vegetation to create an east-west oriented open storage area. The northern one-third of the site and the area north of the railroad tracks contain rectangular storage plots of stored canisters (RMA, 1945b). At least twelve plots are visible north of the railroad tracks and ten plots are visible south of the tracks (RMA, 1945c). These plots are staggered on either side of the railroad tracks. An east-west road or ditch D10B has been constructed in the southern one-third of Site 1-7. The area north of this area appears to contain stored material in a configuration similar to that in the north part of Site 1-7 (RMA, 1945b; RMA, 1945c).

1948

The storage plots visible in 1945 have been removed, and the western part of the area has started to revegetate. Ground scars are visible where the storage plots were. The eastern half of Site 1-7 is being used for open storage (OS4). Sixteen north-south oriented rows of containers are visible in the square-shaped area that extends the full width of Site 1-7. At the northern end of this area, two rows of rail cars are visible on the tracks. West of OS4 are some stored items. The road immediately north of ditch D10B is no longer visible.

Photo Date

Site Description

1951

The material stored at OS4 is still visible. The north-south storage rows appear lighter toned. Unidentified objects are stored north, east, and west of the OS4 storage yard (CAPS, 1951).

1955

The entire area presently occupied by Site 1-7 is visible. Containers and possibly some debris are visible west of OS4. OS4 encompasses the entire area, which is currently occupied by the west and east yards of the HBSF. A new open storage area (Site 1-6) has been constructed south of Site 1-7.

1962

The following facilities are visible: the hydrazine blending pad, six storage tanks, the change house, and the in-ground concrete tank. The open storage facilities and stored materials visible in 1955 have been removed. Storage rails are still visible.

1962

A north-south oriented row of unidentified objects is visible adjacent to the easternmost storage rail. The row is approximately 270 ft in length. A ditch extends due south from an area southwest of the site to First Creek (CAPS, 1962).

1966

The area occupied by the west yard is visible in this aerial photograph. Structures clearly seen include the rail car and truck loading and unloading docks, the blending area, the change house, the storage shed, the six storage tanks (HAS1, HAS2, HAS3, CS1, US1, and US2), and the in-ground tank.

1968

No change from the previous photograph.

<u>Photo Date</u>	<u>Site Description</u>
1970	The entire west yard is visible and appears unchanged since 1966. The UDMH storage facility (east yard) is visible. An east-west, overhead transfer line is visible in the west yard. Dirt roads surround both yards. Open storage has been completely phased out and all storage rails have been removed from the 1970 site. The drum storage pad and covered drum handling area are visible in the west yard (CAPS, 1975).
1976	No change from the previous photograph (CAPS, 1976).
1978	No change from the previous photograph (CAPS, 1978).
1980	The west yard, east yard, and connecting overhead piping can be seen. Additions since 1978 include a security fence around the facility, a drum storage concrete pad, the drum cleaning shed, and the entire east yard including Storage Tanks US-3 and US-4.
1982	No change from the previous photograph (CAPS, 1982).

Site 1-7, the HBSF, is located in the northeastern portion of Section 1. Site 1-7 was originally used by the Army during World War II as an open storage area for the Incendiary Oil Bomb (IOB) Plant (RMA, 1945a; RMA, 1945c; RMA, 1945d). The IOB Plant operated from April 29, 1943, until August 15, 1945. During this period the plant produced a total of 2,613,812 napalm-filled M47 incendiary bombs. Each bomb weighed 100 pounds and contained 5.82 gallons of gasoline and 4.80 pounds of napalm. Napalm is a mixture of aluminum soap of naphthenic, oleic, and coconut fatty acids (RMA, 1945e).

Initially warehouse facilities in the IOB Plant area were used to store M47 casings prior to filling and filled M47 bombs awaiting shipment. Warehouse storage capacity became inadequate shortly after July 1943 as production increased (RMA, 1945d). The northern portion of Site 1-7 subsequently was used as an open storage area for the M47 casing and for filled M47 bombs. This area was part of a larger open storage area that extended beyond the boundaries of Site 1-7. The open storage area was divided by the east-west trending, East Plants rail line (RMA, 1945b; RMA, 1945c). Crates were stored on either side of the railroad tracks. The storage area boundary was located directly east of the IOB plant and extended into Section 6 (RMA, 1945a; RMA, 1945b; RMA, 1945f). The bombs were stored in crates that arrived at the storage area on railroad flatcars. The crates were mechanically unloaded and stacked in "plots" (RMA, 1945b). Crates of filled bombs awaiting shipment from RMA were stacked two high and twelve wide in rows. Each row contained 960 bombs and each storage plot contained 8 rows. Several such storage plots were present along the northern one-third of Site 1-7 (RMA, 1945b; RMA, 1945c; RMA, 1945d).

By 1948, empty ton containers were being stored immediately south of the East Plants rail line, approximately 50 ft east of a building, possibly Building 868C. The storage area was 600 by 457 ft in size. It contained 42 storage rails which were oriented north-south and measured 457 ft long (RMA, 1948; RMA, 1950; Stout & Abbott, 1982/RIC 83368R01). Site 1-7 continued to be used as a storage area until 1975, but only the eastern portion of Site 1-7 was used for storage between 1961 and 1975 (CAPS, 1951; CAPS, 1962; CAPS, 1968; CAPS, 1975; RMA, 1950; RMA, 1961a; Stout & Abbott, 1982/RIC 83368R01; Way, 1985).

The HBSF west yard construction was initiated in 1959 by RMA in conjunction with the U.S. Air Force (PMCDIR, 1977/RIC 81266R68). The facility is owned by the U.S. Air Force and was operated by RMA between 1961 and May 5, 1982 (Strang, 1982d; RMA, 1980). It was built on the western end of the large open storage area that was in operation until at least 1948 (Stout & Abbott, 1982/RIC 83368R01). The primary phase of construction was completed on November 10, 1960. The facility was operational at this time, but had no

storage capabilities (RMA, 1960c). This original portion of the facility, now known as the west yard, consisted of a change house (Building 755), a blending unit, railroad and tank truck loading and unloading platforms (Building 756), an in-ground concrete tank, and a spare parts storage shed (Building 868C) (RMA, 1960e).

The change house used by personnel working in the hydrazine area was also a source of hot water for the blending unit (also Building 756) (RMA, 1960d; Donaghe, 1980c). The change house was serviced with potable water, steam, and electricity. A "soil pipe" connected the building to a 1,000- gallon concrete septic tank located approximately 75 ft to the southeast (RMA, 1960e).

The blending unit is on a concrete pad area. This area contains a blender, designed by the Food Machinery Corporation, and the associated transfer piping. The blending of anhydrous hydrazine (hydrazine) and unsymmetrical dimethylhydrazine (UDMH) to produce Aerozine 50 occurred here. Hydrazine and UDMH were mixed equally (50:50) to produce this final product. The blended fuel was loaded into tank trucks and onto railcars for shipment off the Arsenal (RMA, 1960h; RMA, 1976c; Kim, 1981). The blending unit was provided with potable water, process water, steam, electricity, and a fume scrubber system (RMA, 1960c; RMA, 1960e; RMA, 1960g). A floor drainage system within the concrete pad allowed wastewater to flow to the 50,000 gallon in-ground concrete tank through an existing drainline (RMA, undated; RMA, 1960a). This sump was designed to collect waste from the blending facility for discharge to the industrial sewer system (RMA, 1972a).

A 3,000 ft railcar storage spur was constructed in the southeast portion of Section 36 by June 1961 (RMA, 1961a; CAPS, 1962). The spur was used to store tank cars filled with hydrazine and UDMH until they were moved to the blending pad. Tank cars filled with Aerozine 50 that were to be shipped off of RMA were also stored at this spur (Jacobs, 1985; Way, 1985; Lynes, 1985; CAPS, 1962) No spills or leaks are known to have occurred along the rail spur.

Diked storage facilities were constructed at the hydrazine facility in 1961 (RMA, 1961b). These facilities were collectively known as Building 757. They consisted of four 24,900-gallon tanks designated HAS-1, HAS-2, HAS-3, and CS-1, and two 19,000-gallon tanks designated US-1 and US-2. These six tanks are located in the west yard on concrete pads surrounded by concrete retaining walls. Catch basins to these storage tanks empty into the in-ground concrete tank (RMA, 1972a). Prior to the installation of each tank, the tank interiors were cleaned with trichloroethane and purged with nitrogen (RMA, 1962a). Each tank was also fitted with a fire protection system, a nitrogen pressure blanket, a fume vent line connected to the blender scrubber, and a heated glycol insulation system (RMA, 1962a; RMA, 1972a). Tanks HAS-1, HAS-2, and HAS-3 were used to store hydrazine while Tank CS-1 was used to store contaminated Aerozine 50 prior to incineration. Tanks US-1 and US-2 were used to store UDMH (RMA, 1972a; Barbieri, 1980).

Blending operations began during the last quarter of 1961 (RMA, 1961c). By mid-1962 modifications were made to accommodate the filling of 55 gallon drums with Aerozine 50 (RMA, 1962b). In 1964, increased demands for drummed Aerozine 50 led to the construction of a concrete pad adjacent to the blender. This area was used for the emptying, cleaning, and filling of 55 gallon drums (RMA, 1964a; RMA, 1964b). Also in 1964, a 150 ft² overhead frame structure designated as Building 761 was added to the drum filling station (Donaghe, 1980h).

Additional drum loading facilities were added in 1975 just southeast of the blending area. Building 759, an 800 ft² metal frame structure, was constructed to clean 55 gallon drums. Dirty drums were washed, steam cleaned and vacuum dried. All wastewater flowed through a drainline to the in-ground concrete tank.

Building 760, a metal frame structure situated on a 900 ft² concrete pad, was used to store drums of hydrazine fuels (Saindon, 1977; RMA, 1978b; Donaghe, 1980f; Donaghe, 1980g). A drainage system connected the pad with the in-ground concrete tank (RMA, 1975e). Empty drums were stored in an area south of Building 577 (CAPS, 1962; CAPS, 1968; CAPS, 1975; CAPS, 1976; CAPS,

1978; CAPS, 1982; Unauthored, Undated-b). This area was also used for the temporary parking of tank trucks (Rock, 1976).

In 1975 the Air Force began acquiring large quantities of UDMH soon after discovering that a major manufacturer of UDMH would discontinue production. This stockpiling continued until a new source of UDMH became available. A need for additional UDMH storage capacity at RMA resulted from these acquisitions. By September 1975, a 250,000 gallon storage facility, Building 758, was constructed approximately 750 ft east of the existing facility. The Building 758 area became known as the east yard (Byrne, 1976b; Donnelly, 1975b; RMA, 1975a; Watson, 1975; RMA, 1975b).

The east yard consists of two vertical tanks, US-3 and US-4, and related equipment. Tank US-3 was constructed of carbon steel with dimensions of 24 ft 3 inches in diameter and 16 ft 3 inches in height, and had a holding capacity of 50,000 gallons. To contain possible releases, US-3 was surrounded by a 33 ft² concrete dike (Watson, 1975; RMA, 1975b; RMA, 1975a; RMA, 1960b; Donaghe, 1980b). Tank US-4 was constructed of carbon steel with dimensions of 33.9 ft in diameter and 29.5 ft in height, and had a holding capacity of 200,000 gallons. The tank was surrounded by a 65 ft² concrete dike (Watson, 1975; RMA, 1975c; RMA, 1975a; Donaghe, 1980a). Since neither tank was equipped with bottom outlets, a catch basin and a "dip-leg" were installed (Queen, 1975).

Tank US-3 was moved to the east yard from Section 26, where it had been designated Tank 805 and had been used for "clear water" storage at the Deep Well Waste Effluent Treatment Facility (RMA, 1960b; Ryan, 1960a; Ryan, 1960b; Donaghe, 1980b; RMA, 1975a). Tank US-4 was originally part of the south tank farm (Site 1-10). Documents identify Tank 463D as being moved to the HBSF area; however, aerial photographs reviewed indicate Tank 463E was moved here rather than Tank 463D (Stout & Abbott, 1982/RIC 83368R01; RMA, 1975a; Donaghe, 1980a). From 1975 to 1982, Tanks US-3 and US-4 were used to store unsymmetrical dimethyl hydrazine (UDMH). They were connected to the hydrazine plant by an overhead pipeline 4 inches in diameter and 782 ft long (Donnelly, 1975c; Watson, 1975; Esquibel, 1985; Barbieri, 1981a; Feller, 1979).

An estimated 300,000 gallons of wastewater were generated annually at the hydrazine facility from the combination of surface runoff, wash water, and process water (RMA, 1979). Prior to 1977, wastewater collected in the in-ground concrete tank was not treated before being pumped to Basin F (Ackerman, 1960; Long, 1960; RMA, 1972a). In 1977, neutralization procedures were implemented prior to discharge of the tank contents. This procedure entailed the addition of calcium hypochlorite to the wastewater. The wastewater was then analyzed to determine hydrazine levels. For each gallon of wastewater containing 1 percent hydrazine, 1.6 pounds of granular calcium hypochlorite were added to the tank (Williams, 1978; Melito, 1978). The neutralization of hydrazine fuels and wastewater in the tank produced large quantities of a sediment and sludge mixture. The quantities of sludge (mainly a calcium carbonate sediment) generated were not reported. The sludge was collected, drummed, and disposed in the Section 36 burial pits (Barbieri, 1985; Kuznear & Trautmann, 1980).

Beginning in December 1981, hydrazine wastewater could no longer be discharged in Basin F; the connection to Basin F was severed, and a new underground wasteline was proposed to be installed from the west yard in-ground tank directly to Tanks US-3 and US-4. The combined 250,000 gallon capacity of the tanks in the east yard could store a one-year accumulation of hydrazine wastewater (Barbieri, 1981b; RMA, 1981b; Strang, 1982a; Strang, 1982b). In January 1982, the Air Force granted approval and funding for the new wasteline; the project was completed in March 1982 (USAF, 1982a; USAF, 1982b; McNeill, 1982; Barbieri, 1982; Heim, 1982).

From July 1967 until about 1973, JPX jet propellant was intermittently blended at Site 1-7 at the request of the Air Force (Glenn, 1967; Esquibel, 1972; Esquibel, 1969; Esquibel, 1970; Esquibel, 1971b; Esquibel, 1971c). This particular propellant was produced by blending JP-4 aviation fuel and UDMH (Esquibel, 1971a; Zeorian, 1972; Strode, 1970). The mixing of JP-4 and UDMH was done in ratios of 60/40, 50/50, and 83/17 (Esquibel, 1971a; Esquibel, 1971b; Esquibel, 1971c). JPX was not mixed in the hydrazine blender. Instead, a special piping system was installed at the drum filling station that connected to a tank truck, which served as a mixing container in

order to bypass the blender. When JPX mix was blended, 3/8-inch tubing was used to transfer the UDMH, under nitrogen pressure, from 55-gallon drums to a tanker which already contained the JP-4. Following the final phase of mixing, the product, JPX, was unloaded from the tanker back into the drums. These drums were then shipped off-site (Butoff, 1972; Zeorian, 1972; Strode, 1970; RMA, 1967a; RMA, 1969; RMA, 1970).

The quantity of JPX blended at the HBSF varied throughout its seven year period of production. For instance, in 1967 approximately 33,000 pounds (100 drums) of JPX was produced, in contrast to the 74,776 pounds (226 drums) produced during the 1971 fiscal year (RMA, 1967a; RMA, 1967b; RMA, 1971; Rudy, 1974). Information was not located that described whether other fuels or propellants had been blended at the HBSF.

In May 1982, blending operations were suspended at RMA as a result of nitrosodimethylamine (NDMA) being detected in the ambient air within the facility (RMA, 1982). NDMA, a suspected carcinogen, formed when UDMH was exposed to air (RMA, 1982; Smith, 1983b). Blending operations never resumed. RMA implemented hazard abatement plans to eliminate potential sources of NDMA (RMA, 1983; Smith, 1983b). The abatement plans included the removal of all fuel from the facility and the decontamination of the entire facility. An Air Force contractor submitted a bid for this work in late September 1983 (RMA, 1983).

Available historical records indicate that at least 36.3 million pounds of Aerozine 50 were produced at RMA (RMA, 1964a; RMA, 1964b; RMA, 1965a; RMA, 1965b; RMA, 1966a; RMA, 1966b; RMA, 1967a; RMA, 1967b; RMA, 1968a; RMA, 1968b; RMA, 1969; RMA, 1971; RMA, 1972b; RMA, 1976c; RMA, 1977; RMA, 1981a). Estimates made in 1980 indicate that between the years of 1961 and 1980, approximately 40 to 50 million pounds of Aerozine 50 had been blended at an annual rate of approximately two million pounds a year (RMA, 1980; Barbieri, 1980).

The primary process liquids present at the HBSF during its operational history included hydrazine, unsymmetrical dimethyl hydrazine, monomethyl

hydrazine, and water. The hydrazine fuels, the breakdown products of hydrazine fuels, and related chemicals that may have been present at the HBSF include the following (Boyle, 1975):

- o Ammonia
- o Azomethane
- o Calcium hypochlorite
- o Dimethylamine
- o Dimethylnitrosoamine or N-nitrosodimethylamine
or N,N'-dimethylnitrosoamine
- o Dipiperazine
- o Formaldehyde
- o Formaldehyde hydrazine
- o Hydrazine (anhydrous hydrazine)
- o Methane
- o Methyl alcohol
- o Monomethyl hydrazine (methyl hydrazine)
- o Monopropellant hydrazine
- o Nitromethylamine
- o Nitrous oxide
- o Piperazine
- o Trimethyl hydrazine
- o Tripiperazine and
- o Unsymmetrical dimethyl hydrazine.

Aside from some hydrazines and nitrosamines few, if any, of these compounds are persistent in the environment (Geraghty & Miller, 1986; Hawley, 1981; Lyman et al., 1982; Vershueren, 1977).

Water and possibly unsymmetrical dimethyl hydrazine reportedly accumulated in the concrete berm areas around the storage tanks on at least three occasions. The first recorded instance occurred in November 1975, when a power outage set off the fire protection system in the east yard. The volume of water sprayed into the concrete berm area before the system shut off was sufficient to cause the 200,000 gallon unsymmetrical dimethyl hydrazine

storage tank, US-4, to float. The water was pumped from the berm area to the fields east and south of the east yard (Trautmann, 1984/RIC 86009R01). A more exact description of the area to which this water was pumped was not located. This general area was investigated in another study (see Task 7 CAR, Section 1-UNC). Approximately 2,000 pounds of UDMH was unaccounted for (Esquibel, 1985).

In May 1976, Tank US-4 leaked approximately four inches of unsymmetrical dimethyl hydrazine in the pit around the tank. The liquid was pumped to the in-ground concrete tank in the west yard for disposal (Trautmann, 1984/RIC 86009R01).

In December 1982, an electric circuit breaker was tripped during a 3 ft snowfall causing an air compressor to stop. Lack of air pressure caused the "water deluge system" to activate for about two days. This caused the diked area around the tanks to overflow and freeze. The fire department pumped down the water to prevent ice damage to tank bottoms and piping. The sprinkler system was immediately repaired (Wash et al., 1983).

The HBSF has been described by some sources as poorly maintained. For instance, during the last quarter of 1962, Tank HAS-2 was described as having a leaking flange connection; Tank HAS-3 had a weld leak on the process line; pump equipment had several valves with leaking flange connections; and some tanks had leaky manhole covers. These deficiencies were subsequently corrected (RMA, 1962a).

Documents dating from 1974 to 1983 report various sources of potential contamination at the HBSF. These sources include the following: leaks on pipe flanges where meters were removed; leaking inspection plates on the storage tanks; leaking arm valves and pump shaft seals at load and unload stations; leaking pressure lines; leaking drum station valves and pump shaft seals; short fill-line hoses and cracked hoses; leaking valves in the blender; cracks in the concrete slab of the blender facility; leaking drums stacked on the concrete slab; and leaking flange fittings (Rock, 1974; RMA, 1976a; RMA, 1978b; Morstedt et al., 1977; Smith, 1983a).

A 1976 Rocky Mountain Arsenal memorandum for the record describes the HBSF as continuing to be a neglected facility receiving low priority in Air Force support (Rodgers, 1976), and a 1978 military construction project data sheet described the facility as having been in operation for 18 years with only minor upgrading. Site inspections of the facility in 1978 revealed that almost every major fuel product line valve was leaking and at least three were frozen in the open position. The inspection noted that in many areas the pipe insulation had deteriorated, exposing the piping to the weather (RMA, 1978a). The last of the hydrazine in storage was removed from the HBSF at the end of April 1986 and shipped to a permitted, off-site disposal facility. Since that time, the four hydrazine tanks (HAS-1, HAS-2, HAS-3, and CS-1) and the two unsymmetrical dimethyl hydrazine tanks (US-1 and US-2) in the west yard have been rinsed by RMA personnel with a hypochlorite and water solution to remove the last traces of hydrazine fuels.

Additional documents were reviewed that discuss Site 1-7. These documents further substantiate statements contained within the text of this report. The following citations identify these documents: Barbieri, 1977; Bryne, 1976a; Cook, 1976; Donaghe, 1980d; Donaghe, 1980e; Donaghe, 1980i; Donnelly, 1975a; Ebasco, 1988; Harris, 1982; Loven, 1975; Melito, 1985; Rock, 1975; RMA, 1960f; RMA, 1975d; RMA, 1975f; RMA, 1976a; RMA, 1976b; Strang, 1981; Strang, 1982c; Strang, 1985; Unauthored, undated-a; Ursillo, 1974.

3.0 SITE INVESTIGATION

3.1 PREVIOUS SOIL INVESTIGATIONS

The soils in the HBSF area have been described by Kolmer and Anderson (1977/RIC 81295R07) as the Ascalon-Vona-Truckton Association. These soils are nearly level to strongly sloping, well drained to somewhat excessively drained, loamy and sandy soils formed in wind-laid deposits on uplands. These soils have moderate to high permeabilities (0.6 to 6 inches/hour) (Resource Consultants, 1982/RIC 82096R01).

A soil gas survey was conducted in 1983 at the HBSF. The soil gas detectors were placed at 16 sample locations; two in the east yard, one between the yards, three outside the west yard, and the rest in the west yard. The

detectors consisted of curie point wires tipped with an absorbent. These detectors were covered with aluminum cans, buried in shallow holes in the soil, and left in place for seven days. After recovery, the contents of the absorbent were analyzed using a mass spectrometer. Any hydrazine and related hydrazine fuels that were trapped on the wire detectors were expected to have broken down during this process, producing, among other analytes, nitrogen. Levels of nitrogen over 20 times background values were detected in the mass spectrometric results (Trautmann, 1984/RIC 86009R01). However, because nitrogen was measured, not hydrazines, this indirect method was neither intended to, nor capable of, confirming the presence of hydrazine in the soil or groundwater beneath the HBSF.

3.2 PHASE I SURVEY

3.2.1 Phase I Program

Using the methodology presented in the Task 11 Technical Plan (Ebasco, 1986/RIC 86238R03), 15 borings at a boring density of $1/54,000 \text{ ft}^2$, yielding 54 samples, were drilled to depths ranging from 5 to 40 ft. Two of these, Borings 11 and 14, were completed as monitoring wells 01701 and 01702 as part of the Phase I program.

A field reconnaissance of this site was conducted to assess and stake the boring locations. During the field program several of the proposed Phase I borings were relocated to areas where potential contamination was more likely, such as low areas and along railroad tracks where loading and unloading operations could have caused leaks or spills. Borings 1, 8, and 5 were moved approximately 20 ft to low-lying areas. Boring 2 was relocated less than 20 ft south onto the railroad tracks. Boring 14 was moved approximately 20 ft north to the perimeter road of the east yard. Boring 13 was moved less than 20 ft after a core barrel sheared off at the original location. Boring 15 was relocated south of the east yard tanks because of possible underground utilities. Figure 1-7-1 shows the locations of the 15 Phase I borings as they were drilled.

No geophysical clearance of the boring locations was conducted for safety purposes because there was no information indicating that any unexploded ordnance, buried metal, or other buried objects were likely to be present.

Water saturation was found in the borings at depths of between 17.5 to 21 ft below the ground surface.

Samples were taken at the proposed intervals from most borings, but some sample intervals were changed. In Boring 2, a sample from the 5.1 to 6.1 ft interval replaced the sample from 4 to 5 ft, which contained paint chips from a new core barrel; a short sample was collected from 9.5 to 10 ft because of a defective core barrel; and a 16.5 to 17.5 ft sample from just above the water table replaced the planned 9 to 10 ft sample. Although Boring 11 was planned to be sampled only to 5 ft, this location was chosen for a monitoring well, so the boring was drilled deeper and was sampled to 20 ft. An additional sample was collected from the 7.5 to 8.5 ft interval of Boring 12 because this interval had a medium to dark green color that was not seen in any other samples from the site. A sample from 13 to 14 ft replaced the planned 14 to 15 ft sample from Boring 13 because the sampling tube crumpled in the deeper interval. Finally, additional samples to 25 ft were collected from Boring 14, which had been planned to 10 ft, but was drilled deeper and completed as a monitoring well; these extra samples replaced those that had been planned for nearby Boring 15.

Fifteen borings, yielding 54 samples, were actually completed at Site 1-7, as follows:

<u>Boring Number</u>	<u>Depth (feet)</u>	<u>Number of Samples</u>
1	10	3
2	17.1	6
3	5	2
4	25	6
5	5	2
6	5	2

<u>Boring Number</u>	<u>Depth (feet)</u>	<u>Number of Samples</u>
7	10	3
8	10	3
9	5	2
10	10	3
11	40*	5
12	10	4
13	15	4
14	40*	6
15	10	3

* Drilled to 40 ft, but only sampled above the saturated zone to 20 ft in Boring 11 and to 25 ft in Boring 14.

All but one sample were analyzed by gas chromatography/mass spectrometry (GC/MS) for volatile organics (except the 0-1 ft interval) and semivolatile organics; by an inductively coupled argon plasma (ICP) screen for metals; and by separate analyses for hydrazines, nitrosamines, dibromochloropropane, arsenic, and mercury. The single sample that was omitted was the 0 to 1 ft interval of Boring 9, which was not analyzed because it consisted entirely of loose gravel. Appendix 1-7-A presents the specific target analytes for which laboratory analyses were conducted. A summary of the results of these analyses is presented in Table 1-7-2, Section 3.2.4 of this report.

The Phase I remedial investigation program for this site was developed and implemented based on historic documentation, aerial photographs, and other information available at the time of its implementation. Since that time, previously unavailable information has been identified and incorporated into the history section of this report. Furthermore, this additional information has been evaluated in detail to determine how it might affect the investigation approach at this site. Based upon this evaluation, it has been determined that the additional information collected since the Phase I and Phase II programs were designed does not substantially alter the view of

potential contamination at this site. As a result, the Phase I program as conducted and the Phase II program as planned are judged to provide a complete overall investigation of the possible contamination at this site. Nevertheless, the Phase II program has been revised to propose additional sampling to be conducted during remedial action to assess some specific areas not sampled in the Phase I program (see Section 3.3).

3.2.2 Phase I Field Observations

Site 1-7 consists of two fenced areas connected by an overhead pipeline. The site is not in use, but the tanks, buildings, roads, and railroad tracks are still present. The area that is not paved is sparsely covered by grass.

In situ air monitoring was conducted during drilling operations using an organic vapor analyzer (OVA), an MSA260 combustible gas and oxygen meter to detect oxygen concentrations and explosive levels, and a hydrazine meter. OVA readings from 8 borings were slightly above background, and all samples from Boring 12 had readings well above background. The results of the volatile organic readings down the borings at the sampled depths are presented in Table 1-7-3, Section 3.2.4 of this report.

An M8 alarm and an M18A2 test kit were used to monitor for the presence of chemical agents in the borehole or soil samples per standard operating procedures. The M8 alarm is used specifically to detect sarin (GB) and VX at detection levels of 0.2 and 0.4 milligrams per cubic meter (mg/m^3) after a response time of 2 to 3 minutes (USAMDARC, 1982; USAMDARC, 1979). However, many other substances in addition to these two target compounds can cause the M8 alarm to respond, including smoke and engine exhaust. The M18A2 is used as a backup test if an M8 alarm is triggered, as a substitute for an M8, and as a specific check for the presence of mustard. The M18A2 detects G agents, V agents, all forms of mustard, and lewisite. Specifically at RMA, the M18A2 test kit is used to detect GM (sarin), VX, H (mustard), HD (distilled mustard), and L (lewisite), based upon the knowledge that these agents were manufactured, stored, or demilitarized at the site. The detection limit for all mustard agents is $0.5 \text{ mg}/\text{m}^3$; the detection limit for all G agents, VX, and L is $0.2 \text{ mg}/\text{m}^3$.

The M8 alarm was triggered during drilling of Boring 13, but the alarm appeared to be malfunctioning. An M18A2 test kit was immediately used to refute the presence of chemical agents in that boring. The M18A2 kit was used a second time during the drilling of Boring 14 because of the unavailability of a functioning M8 meter. All results from the M18A2 kit were negative for chemical agents.

No unexploded ordnance, buried metal, or other buried objects were detected during drilling. The 7.5 to 8.5 ft interval of Boring 12 had a green stain that was not observed in any other intervals, and this interval was sampled for analysis.

3.2.3 Geophysical Exploration

No geophysical clearance or exploration was conducted at Site 1-7 because the underground piping and structures were already known.

3.2.4 Phase I Analyte Levels and Distribution

Methylisobutyl ketone, dieldrin, cadmium, chromium, copper, lead, zinc, and arsenic were detected within or above their indicator levels at Site 1-7. The number of samples containing these analytes, and the concentration range, median, mean, standard deviation, detection limit, and indicator level are listed in Table 1-7-2. The results of geologic field observations, air monitoring during drilling, and the chemical analyses of each soil sample are summarized in Table 1-7-3.

Indicator levels and ranges were established to assess the significance of metal and organic analytical values. The indicator levels for organics are the method detection limits. The indicator ranges for metals reflect the concentrations expected to occur naturally in RMA alluvial soils. Selection of these ranges is discussed in the Introduction to the Contamination Assessment Reports (ESE, 1987).

Methylisobutyl ketone was detected at 1 microgram per gram (ug/g) in the 4 to 5 ft interval of Boring 10, which was drilled on the railroad tracks near the loading dock. Dieldrin was found at 0.4 ug/g in the surface sample from

Table 1.7-2. Summary of Analytical Results for Site 1-7. Page 1 of 1.

Constituent	Number of Samples*	Concentration (ug/g)						Indicator Level
		Range	Median**	Mean**	Standard Deviation**	DataChem Detection Limit	CAL Detection Limit	
<u>Volatiles (N=39)</u>								
MIBK	1	1	-	-	-	0.5	0.5	DL
<u>Semivolatiles (N=54)</u>								
Dieldrin	1	0.4	-	-	-	0.3	0.3	DL
<u>ICP Metals (N=54)</u>								
Cadmium	1	1.7	-	-	-	0.74	0.66	1.0-2.0
Chromium	39	8.1-27	13	14	4.4	6.5	5.2	25-40
Copper	52	5.8-81	14	22	16	4.7	4.9	20-35
Lead	29	11-130	17	25	28	8.4	13	25-40
Zinc	53	24-150	60	68	32	8.7	9.5	60-80
<u>Hydrazines (N=54)</u>								
None detected								
<u>Nitrosamines (N=54)</u>								
None detected								
<u>Dibromochloropropane (N=54)</u>								
None detected								
Arsenic (N=54)	5	3.1-12	3.4	5.2	3.4	2.5	5.0	DL-10
Mercury (N=54)	2	0.086-0.092	-	-	-	0.050	0.060	DL-0.10

DL - The indicator level is the detection limit for DataChem and CAL Laboratories, as appropriate
N - Number of samples analyzed
* - Number of samples in which constituent was detected; only these samples were used in statistical analyses
** - Median, mean, and standard deviation not calculated when constituent detected in fewer than 5 samples

Table 1-7-3. Results of Phase I Field Study. Page 1 of 12.

Depth (feet) Geologic Material	Boring 1		
	0-1 Clayey Sand W/Gravel	4-5 Sand	9-10 Sand and Gravel/ Sandy Claystone 0/70
Percent Pine ^{VO}	25	0	
AIR MONITORING			
Volatile Organic Readings (ppm)			
OVA's	1.5*	2.0*	2.0
SOIL CHEMISTRY			
Volatiles (ug/g)			
Methylisobutyl ketone	NA	BDL	BDL
Semivolatiles (ug/g)			
Dieldrin	0.4	BDL	BDL
Dibromochloropropane(ug/g)			
None detected			
Hydrazines (ug/g)			
None detected			
Nitrosamines (ug/g)			
None detected			
ICP Metals (ug/g)			
Cadmium	1.7	BDL	BDL
Chromium	27	16	13
Copper	15	10	81
Lead	130	BDL	BDL
Zinc	150	43	92
Arsenic (ug/g)	BDL	BDL	BDL
Mercury (ug/g)	0.086	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

* - Readings taken over cuttings

Table 1-7-3. Results of Phase I Field Study. Page 2 of 12.

Depth (feet)	Boring 2					
	0-1 Gravelly Silty Sand/Silt and Clay	4-5 Clayey Silt W/Gravel	5.1-6.1 Silty Clay W/Gravel	9.5-10 Clay and Claystone	14-15 Claystone	16.5-17.5 Claystone
Percent Fines ^{VO}	40/100	95	95	100	100	100
AIR MONITORING						
<u>Volatile Organic Readings (ppm)</u>						
OVA's	1.2*	1.4*	1.4*	1.2*	0.4*	0.4*
SOIL CHEMISTRY						
<u>Volatiles (ug/g)</u>						
Methylisobutyl ketone	NA	BDL	BDL	BDL	BDL	BDL
<u>Semivolatiles (ug/g)</u>						
Dieldrin	BDL	BDL	BDL	BDL	BDL	BDL
<u>Dibromochloropropane (ug/g)</u>						
None detected						
<u>Hydrazines (ug/g)</u>						
None detected						
<u>Nitrosamines (ug/g)</u>						
None detected						
<u>ICP Metals (ug/g)</u>						
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	10	11	13	13	10	BDL
Copper	8.6	8.2	13*	33	43	49
Lead	15	BDL	BDL	16	23	31
Zinc	34	34	45	89	110	100
Arsenic (ug/g)	BDL	BDL	BDL	3.4	BDL	BDL
Mercury (ug/g)	BDL	BDL	BDL	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

* - Readings taken over cuttings

Table 1-7-3. Results of Phase I Field Study. Page 3 of 12.

Depth (feet)	Boring 3	
	0-1 Sandy Silt and Sandy Clay 90	4-5 Silty Sand w/Clay 10
Geologic Material		
Percent Pines VO		
AIR MONITORING		
Volatile Organic Readings (ppm)		
OVAS	NR	0.2
SOIL CHEMISTRY		
Volatiles (ug/g)		
Methylisobutyl ketone	NA	BDL
Semivolatiles (ug/g)		
Dieldrin	BDL	BDL
Dibromochloropropane(ug/g)		
None detected		
Hydrazines (ug/g)		
None detected		
Nitrosamines (ug/g)		
None detected		
ICP Metals (ug/g)		
Cadmium	BDL	BDL
Chromium	20	19
Copper	16	13
Lead	15	BDL
Zinc	63	56
Arsenic (ug/g)		
	BDL	3.2
Mercury (ug/g)		
	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

NR - Not recorded

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

Table 1-7-3. Results of Phase I Field Study. Page 4 of 12.

Depth (feet)	Boring 4					
	0-1 Sand and Gravel/ Clayey Sand	4-5 Sand W/Silt	9-10 Sand/Sandy Clay	14-15 Silty Sandy Claystone	19-20 Sandy Claystone	24-25 Silty Sandy Claystone
Percent Fines ^{VO}	0/30	5	0/60	80	80	60
AIR MONITORING						
Volatile Organic Readings (ppm)						
OVA5	0.6	0.6	0.6	1.8	2.0	2.2*
SOIL CHEMISTRY						
Volatiles (ug/g)						
Methylisobutyl ketone	NA	BDL	BDL	BDL	BDL	BDL
Semivolatiles (ug/g)						
Dieldrin	BDL	BDL	BDL	BDL	BDL	BDL
Dibromochloropropane (ug/g)						
None detected						
Hydrazines (ug/g)						
None detected						
Nitrosamines (ug/g)						
None detected						
ICP Metals (ug/g)						
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	BDL	15	14	BDL	BDL	11
Copper	6.5	8.2	10	43	47	46
Lead	BDL	BDL	BDL	BDL	BDL	BDL
Zinc	20	38	41	100	110	110
Arsenic (ug/g)	BDL	BDL	BDL	BDL	BDL	BDL
Mercury (ug/g)	BDL	BDL	BDL	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

* - Readings taken over cuttings

Table 1-7-3. Results of Phase I Field Study. Page 5 of 12.

Depth (feet)	Geologic Material	Boring 5		Boring 6	
		0-1	4-5	0-1	4-5
		Silty Sand/ Sandy Clayey Silt	Sand	Clayey Sand w/Silt	Clayey Sand
Percent PineVO		30/80	0	10	40
AIR MONITORING					
<u>Volatile Organic Readings (ppm)</u>					
OWAS		NR	BDL	0.2*	0.2*
SOIL CHEMISTRY					
<u>Volatiles (ug/g)</u>					
Methylisobutyl ketone		NA	BDL	NA	BDL
<u>Semivolatiles (ug/g)</u>					
Dieldrin		BDL	BDL	BDL	BDL
<u>Dibromochloropropane(ug/g)</u>					
None detected					
<u>Hydrazines (ug/g)</u>					
None detected					
<u>Nitrosamines (ug/g)</u>					
None detected					
<u>ICP Metals (ug/g)</u>					
Cadmium		BDL	BDL	BDL	BDL
Chromium		15	13	20	18
Copper		10	8.0	11	14
Lead		16	BDL	13	BDL
Zinc		48	33	43	60
Arsenic (ug/g)		BDL	BDL	BDL	BDL
Mercury (ug/g)		BDL	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

NR - Not recorded

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

* - Readings taken over cuttings

Table 1-7-3. Results of Phase I Field Study. Page 6 of 12.

Depth (feet)	Geologic Material	Boring 7			Boring 8		
		0-1	4-5	9-10	0-1	4-5	9-10
		Silty Sand	Sand	Silty Sandy	Sandy	Clayey Silt	Claystone
		W/Gravel	W/Silt	Claystone	Silt		
Percent Fines ^{VO}		15	5	90	60	100	100
AIR MONITORING							
Volatile Organic Readings (ppm)							
OVAS		0.4*	0.2*	0.4*	BDL	BDL	BDL
SOIL CHEMISTRY							
Volatiles (ug/g)							
Methylisobutyl ketone		NA	BDL	BDL	NA	BDL	BDL
Semivolatiles (ug/g)							
Dieldrin		BDL	BDL	BDL	BDL	BDL	BDL
Dibromochloropropane(ug/g)							
None detected							
Hydrazines (ug/g)							
None detected							
Nitrosamines (ug/g)							
None detected							
ICP Metals (ug/g)							
Cadmium		BDL	BDL	BDL	BDL	BDL	BDL
Chromium		11	8.6	12	17	10	17
Copper		10	BDL	40	12	22	19
Lead		120	BDL	22	17	BDL	13
Zinc		38	24	98	52	58	60
Arsenic (ug/g)		BDL	BDL	BDL	3.1	BDL	BDL
Mercury (ug/g)		BDL	BDL	BDL	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analysed

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

* - Readings taken over cuttings

Table 1-7-3. Results of Phase 1 Field Study. Page 7 of 12.

Depth (feet) Geologic Material	Boring 9		Boring 10	
	0-1 Gravel	4-5 Clayey Sand	0-1 Silty Sandy Gravel/ Silty Clay 10/100	4-5 Sand, W/Silt 5 9-10 Sandy Clay 70
Percent PineauVO	0	40		
AIR MONITORING				
Volatile Organic Readings (ppm)				
OVAS	BDL	BDL	BDL	BDL
SOIL CHEMISTRY				
Volatiles (ug/g)				
Methylisobutyl ketone	I	BDL	NA	BDL
Semivolatiles (ug/g)				
Dieldrin	I	BDL	BDL	BDL
Dibromochloropropane(ug/g)				
None detected				
Hydrazines (ug/g)				
None detected				
Nitrosamines (ug/g)				
None detected				
ICP Metals (ug/g)				
Cadmium	I	BDL	BDL	BDL
Chromium	I	16	10	BDL
Copper	I	18	12	9.4
Lead	I	19	21	6.7
Zinc	I	80	56	BDL
Arsenic (ug/g)	I	4.2	BDL	BDL
Mercury (ug/g)	I	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

I - 0-1 sample was loose gravel, no constituents analyzed

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

Table 1-7-3. Results of Phase I Field Study. Page 8 of 12.

Depth (feet)	Boring 11			
	0-1	4-5	9-10	14-15
Geologic Material	Sandy Clayey Gravel and Silt and Sand	Sandy Clayey Silt	Claystone	Claystone
Percent Pines ^{VO}	45	90	100	100
AIR MONITORING				
Volatile Organic Readings (ppm)				
OVAS	1.4*	1.2	0.8	0.7
SOIL CHEMISTRY				
Volatiles (ug/g)				
Methylisobutyl ketone	NA	BDL	BDL	BDL
Semivolatiles (ug/g)				
Dieldrin	BDL	BDL	BDL	BDL
Dibromochloropropane(ug/g)				
None detected				
Hydrazines (ug/g)				
None detected				
Nitroamines (ug/g)				
None detected				
ICP Metals (ug/g)				
Cadmium	BDL	BDL	BDL	BDL
Chromium	22	23	14	10
Copper	30	16	13	44
Lead	21	14	BDL	BDL
Zinc	110	62	73	110
Arsenic (ug/g)	BDL	BDL	BDL	BDL
Mercury (ug/g)	BDL	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

* - Readings taken over cuttings

Table 1-7-3. Results of Phase I Field Study. Page 9 of 12.

Depth (feet)	Boring 12			
	0-1 Sandy Silt W/Clay 80	4-5 Clayey Silt W/Sand 95	7.5-8.5 Sand and Claystone 50	9-10 Sandy Claystone 90
Geologic Material				
Percent Fine&VO				
AIR MONITORING				
<u>Volatile Organic Readings (ppm)</u>				
OWAS	20*	30*	80*	20*
SOIL CHEMISTRY				
<u>Volatiles (ug/g)</u>				
Methylisobutyl ketone	NA	BDL	BDL	BDL
<u>Semivolatiles (ug/g)</u>				
Dieldrin	BDL	BDL	BDL	BDL
<u>Dibromochloropropane(ug/g)</u>				
None detected				
<u>Hydrasines (ug/g)</u>				
None detected				
<u>Nitrosamines (ug/g)</u>				
None detected				
<u>ICP Metals (ug/g)</u>				
Cadmium	BDL	BDL	BDL	BDL
Chromium	9.9	15	BDL	BDL
Copper	17	25	31	39
Lead	22	23	BDL	16
Zinc	76	130	100	110
Arsenic (ug/g)	BDL	12	BDL	BDL
Mercury (ug/g)	0.092	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

* - Readings taken over cuttings

Table 1-7-3. Results of Phase I Field Study. Page 10 of 12.

Depth (feet)	Boring 13			
	0-1 Sandy Silt 60	4-5 Clayey Sand w/Silt 20	9-10 Sandy Claystone 70	13-14 Sandy Claystone 90
Geologic Material				
Percent Fines ^{VO}				
AIR MONITORING				
Volatile Organic Readings (ppm)				
OWAS	BDL	BDL	BDL	NR
SOIL CHEMISTRY				
Volatiles (ug/g)				
Methylisobutyl ketone	NA	BDL	BDL	BDL
Semivolatiles (ug/g)				
Dieldrin	BDL	BDL	BDL	BDL
Dibromochloropropane(ug/g)				
None detected				
Hydrasines (ug/g)				
None detected				
Nitroamines (ug/g)				
None detected				
ICP Metals (ug/g)				
Cadmium	BDL	BDL	BDL	BDL
Chromium	10	14	BDL	BDL
Copper	12	16	44	48
Lead	19	19	14	18
Zinc	49	73	93	110
Arsenic (ug/g)	BDL	BDL	BDL	BDL
Mercury (ug/g)	BDL	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

NR - Not recorded

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent.

Table 1-7-3. Results of Phase 1 Field Study. Page 11 of 12.

Depth (feet)	Boring 14				
	0-1	4-5	9-10	14-15	19-20
Geologic Material	Gravelly Sand/ Sandy Clay	Sand	Sand	Clayey Sand	Sandy Claystone
Percent PinesVO	0/70	0	0	40	80
					95
					95
AIR MONITORING					
<u>Volatile Organic Readings (ppm)</u>					
OVA8	BDL	BDL	BDL	BDL	3.0
SOIL CHEMISTRY					
<u>Volatiles (ug/g)</u>					
Methylisobutyl ketone	NA	BDL	BDL	BDL	BDL
<u>Semivolatiles (ug/g)</u>					
Dieldrin	BDL	BDL	BDL	BDL	BDL
<u>Dibromochloropropane(ug/g)</u>					
None detected					
<u>Hydrazines (ug/g)</u>					
None detected					
<u>Nitrosamines (ug/g)</u>					
None detected					
<u>ICP Metals (ug/g)</u>					
Cadmium	BDL	BDL	BDL	BDL	BDL
Chromium	11	BDL	8.1	BDL	BDL
Copper	14	6.3	5.8	8.4	41
Lead	26	11	BDL	BDL	13
Zinc	58	29	30	32	94
Arsenic (ug/g)	BDL	BDL	BDL	BDL	BDL
Mercury (ug/g)	BDL	BDL	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

Table 1-7-3. Results of Phase I Field Study. Page 12 of 12.

Depth (feet)	Boring 15		
	0-1	4-5	9-10
Geologic Material		Clayey Sand	Sand
Percent Fines ^{VO}	0	30	0
AIR MONITORING			
<u>Volatile Organic Readings (ppm)</u>			
OVAS	BDL	BDL	BDL
SOIL CHEMISTRY			
<u>Volatiles (ug/g)</u>			
Methylisobutyl ketone	NA	BDL	BDL
<u>Semivolatiles (ug/g)</u>			
Dieldrin	BDL	BDL	BDL
<u>Dibromochloropropane(ug/g)</u>			
None detected			
<u>Hydrasines (ug/g)</u>			
None detected			
<u>Nitrosamines (ug/g)</u>			
None detected			
<u>ICP Metals (ug/g)</u>			
Cadmium	BDL	BDL	BDL
Chromium	BDL	9.3	9.3
Copper	8.4	9.8	7.6
Lead	12	12	BDL
Zinc	37	42	38
<u>Arsenic (ug/g)</u>	BDL	BDL	BDL
<u>Mercury (ug/g)</u>	BDL	BDL	BDL

BDL - Below detection limit

NA - Not analyzed

S - As referenced to calibration standard of methane for OVA; reading has been adjusted to account for background level

VO - As determined by visual observation and rounded to the nearest 5 percent

Boring 1, which was drilled in a drainage at the northwest corner of the site. Both methylisobutyl ketone and dieldrin were detected in only one sample each. No other target organic compounds were detected.

Cadmium and chromium were detected within their indicator ranges in the surface sample from Boring 1. Copper was above its indicator range in bedrock samples from across the site (Borings 1, 2, 4, 7, 11, 12, 13, and 14). These copper concentrations were less than 50 ug/g except in Boring 1, where copper was found at 81 ug/g. Copper was also detected within its indicator range in two bedrock samples and three alluvial samples in and near the west yard.

Lead was detected above its indicator range at 130 and 120 ug/g in the surface samples from Borings 1 and 7. Boring 1 was drilled in the ditch at the northwest corner of the site, and Boring 7 was drilled directly under the overhead pipeline connecting the two yards. Lead was within its indicator range in one other alluvial sample from Boring 14 and in one bedrock sample from Boring 2.

Zinc was above its indicator range at concentrations up to 150 ug/g in surface samples from the alluvium in Borings 1 and 11 and from the near-surface alluvial sample from Boring 12. All of these borings were drilled in or near the west yard. Zinc was within its indicator range in six other surface and near-surface alluvial samples. Zinc was above its indicator range in all but two bedrock samples and was within its indicator range in both of these. The highest zinc concentration in a bedrock sample was 120 ug/g.

Arsenic was found above its indicator range only in the near-surface alluvial sample of Boring 12, in the west yard, and was within its indicator range in three samples from the surface and near-surface intervals in the alluvium and in one bedrock sample, mostly in the western part of the site. Mercury was within its indicator range in two surface samples from Borings 1 and 12 in the western part of the site.

The distribution of analytes detected within or above their indicator levels in the Phase I soil sampling is presented in Figure 1-7-6. A tabulation of all analytical data from the Phase I program is presented in Appendix 1-7-B.

In addition, several compounds were detected by GC/MS that were not included in the target compound list and that were not conclusively identified. Table 1-7-4 lists the boring number, sample interval depth, relative retention time (shown as "unknown number" on the table), concentration, sample number, lot, best-fit identification, and comments for these nontarget compounds detected at Site 1-7. It should be noted that an individual compound may have more than one retention time, and also that a particular retention time may be assigned to more than one compound. Therefore, Table 1-7-4 provides only a general indication of additional compounds that may be present.

Most of the nontarget compounds detected were tentatively identified as low concentrations of naturally occurring esters and organic acids, fuel or oil related products (alkanes and alkenes), common low toxicity solvents (acetone and ethanol), and common plasticizers (phthalates). Higher concentrations of nontarget compounds were found in three borings. On the railroad track near the east yard (Boring 4), a dioctyl ester, hexanedioic acid, and dioctyl phthalate were tentatively identified at elevated concentrations in the surface sample only. Other elevated concentrations of a compound tentatively related to acetic acid were found in three samples from the south part of the west yard (Boring 12), along with possible benzothiazole, hydrocarbons, and a chlorinated unknown. This boring was stained green in the upper bedrock sample, and one of the alluvial samples from this boring contained anomalous, high concentrations of zinc and arsenic. Several organic acids and esters were tentatively identified with hydrocarbons in an alluvial sample from the east yard (Boring 14).

Below the ditch leading south from the west yard (Boring 8), low concentrations of alkanes and alkenes were tentatively identified in all samples. The compound 1,1,2-trichloro-1,2,2-trifluoroethane (freon-113) was tentatively identified in the near-surface interval of a boring on the

4-5	BIL
9-10	Cu 81 Zn 92

0-1	BIL
4-5	MIBK I
9-10	BIL

0-1	BIL
4-5	BIL
5.1-6.1	BIL
9.5-10	Cu 33 Zn 89 As 3.4
14-15	Cu 43 Zn 110
16.5-17.5	Pb 31 Cu 49 Zn 100

DECEMBER SEVENTH AVENUE

4-5	Zn 80 As 4.2
-----	-----------------

0-1	Zn 63
4-5	As 3.2

0-1	Cu 30 Zn 110
4-5	Zn 62
9-10	Zn 73
14-15	Cu 44 Zn 120
19-20	Cu 44 Zn 110

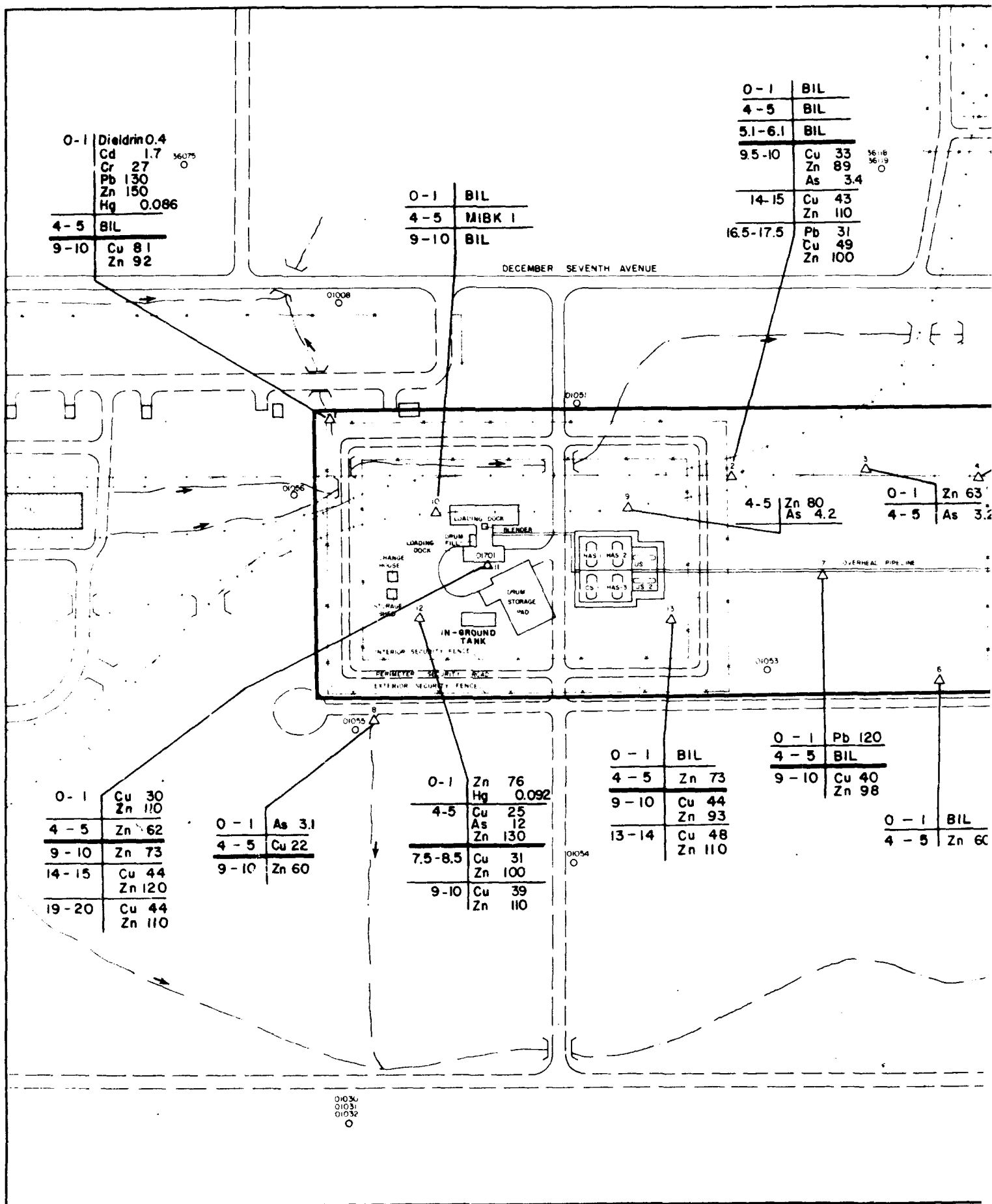
0 - 1	As 3.1
4 - 5	Cu 22
9 - 10	Zn 60

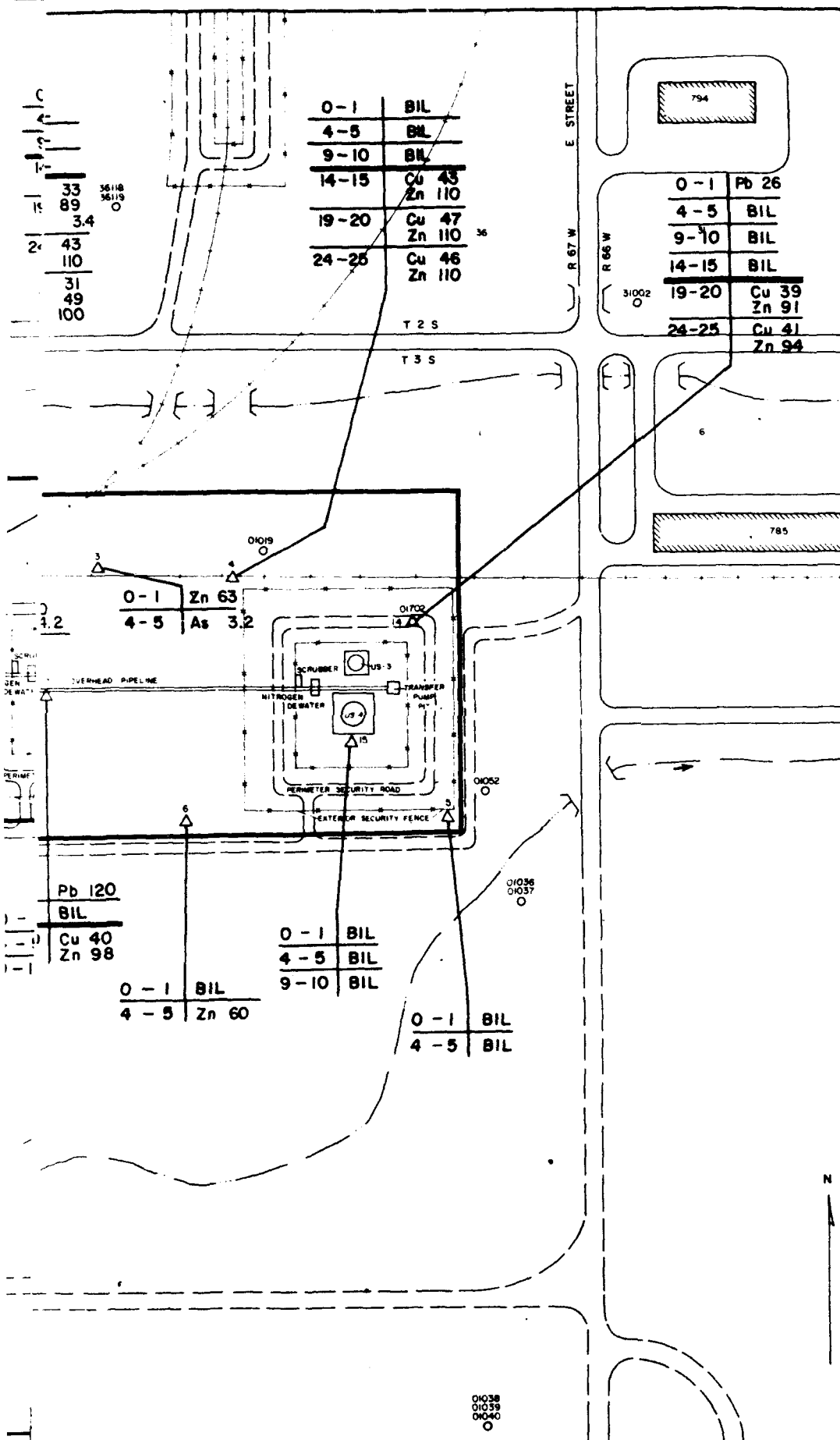
0-1	Zn	76
	Hg	0.092
4-5	Cu	25
	As	12
	Zn	130
7.5-8.5	Cu	31
	Zn	100
9-10	Cu	39
	Zn	110

0 - 1	BIL
4 - 5	Zn 73
9 - 10	Cu 44 Zn 93
13 - 14	Cu 48 Zn 110

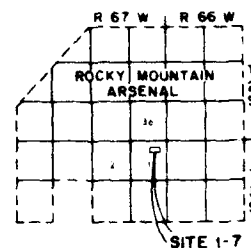
0 - 1	Pb 120
4 - 5	BIL
9 - 10	Cu 40 Zn 98

0 - 1	BIL
4 - 5	Zn 6C





LEGEND



LEGEND

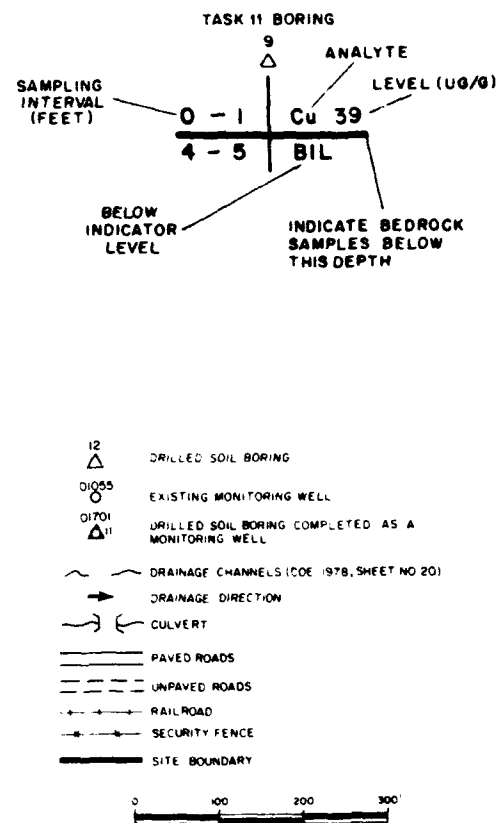


Figure 1-7-6
ANALYTES DETECTED WITHIN
AND ABOVE INDICATOR LEVELS

SITE 1-7
 Rocky Mountain Arsenal, Task 11
 Prepared by: Geraghty & Miller, Inc.
 for Ebasco Services, Inc.

Prepared For:
 Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland

Table 1-7-4. Tentative Identification of Nontarget Compounds Detected in Soils. Page 1 of 7.

Boothole Number	Interval Depth (ft)	Unknown Number	Concentration (ppm)*	Sample Number	Lot	Best-fit Identification	Comments
1	0-1						K
				008	BCT		K
	4-5	635	0.4	002	BCV	unknown alkene or alcohol, possibly C9	A,P
2	9-10	611	0.4	002	BCU	nonanediolic acid, dibutyl ester	K
				003	BCV		P
	0-1	602	2.0	005	BBM	unknown phthalate, possibly butyl 2-methylpropyl	A,C,P
		606	0.9	005	BBM	unknown phthalate, possibly bis(2-methoxyethyl)	A,C,P
		616	0.4	005	BBM	unknown alkene	A,P
		628	3.0	005	BBM	not identified	A,P
	4-5	637	0.5	005	BBM	unknown alkene or alcohol	A,P
		642	0.7	005	BBM	1,2-benzenedicarboxylic acid, dioctyl ester	A,P
				004	BBL		K
				006	BBM		K
	5-6			005	BBL		K
				007	BBM		K
	9.5-10	45	1.6	006	BBL	acetone	P
		628	1.4	008	BBM	not identified	A,C,P
		642	0.7	008	BBM	dioctyl phthalate	C,P
	14-15	35	6.6	007	BBL	ethanol	C,P
		610	0.9	009	BBM	nonanediolic acid, dibutyl ester	C,P
		628	0.7	009	BBM	hexanediolic acid, dioctyl ester	C,P
		642	0.9	009	BBM	1,2-benzenedicarboxylic acid, dioctyl ester	P
	16-17	34	7.5	008	BBL	ethanol	P
		91	1.1	008	BBL	unknown hydrocarbon	A,P
		628	3.0	010	BBM	not identified	A,P
		642	1.0	010	BBM	1,2-benzenedicarboxylic acid, dioctyl ester	P

A - No positive identification
C - Plasticizer
P - Low concentration
K - None detected
* - Values reported are blank corrected.

Table 1-7-4. Tentative Identification of Nontarget Compounds Detected in Soils. Page 2 of 7.

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration (ppm)*	Sample Number	Lot	Best-fit Identification	Comments
3	0-1			002	BCS		K
	4-5			003	BCS		K
4	0-1	628	75	010	BCS	hexanedioic acid, dioctyl ester	C
		642	25	010	BCS	dioctyl phthalate	
	4-5			003	BCT		K
				005	BCS		K
	9-10			004	BCT		K
		610	0.4	006	BCS	nonanedioic acid, dibutyl ester	P
	14-15			005	BCT		K
				007	BCS		K
	19-20			006	BCS		K
				008	BCT		K
	24-25			007	BCS		K
				009	BCD		K
5	0-1			004	BCD		K
				003	BCE		K
	4-5			005	BCD		K
				002	BCD		K
6	0-1			002	BCE		K
				003	BCD		K
7	0-1			006	BCD		K
				004	BCE		K
	4-5			007	BCD		K
				005	BCE		K
				008	BCE		K

C - Plasticizer
P - Low concentration
K - None detected
* - Values reported are blank corrected.

Table 1-7-4. Tentative Identification of Nontarget Compounds Detected in Soils. Page 3 of 7.

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration (ppm)*	Sample Number	Lot	Best-fit Identification	Comments
8	0-1	583	0.5	002	BBM	unknown, possibly phosphoric acid tributyl ester	A,P
		602	0.6	002	BBM	unknown, possibly 1,2-benzenedicarboxylic acid phthalate ester	A,C,P
		606	0.5	002	BBM	unknown, possibly 1,2-benzenedicarboxylic acid phthalate ester	A,C,P
	4-5	616	0.3	002	BBM	unknown alkane	A,P
		628	0.6	002	BBM	hexanedioic acid, dioctyl ester	P
		637	0.4	002	BBM	unknown alkene	A,P
		593	0.4	002	BBL	unknown alkane	K
		598	0.4	003	BBM	unknown alkane	A,P
		602	1.1	003	BBM	unknown phthalate, possibly butyl 3-methyl propyl	A,C,P
		606	0.5	003	BBM	unknown phthalate, possibly bis (2-methoxyethyl)	A,C,P
		616	0.4	003	BBM	unknown alkane	A,P
		628	2.8	003	BBM	not identified	A,P
		642	0.5	003	BBM	1,2 benzenedicarboxylic acid, diisooctyl ester	P
9	9-10	593	0.8	003	BBL	unknown alkane	K
		598	1.0	004	BBM	unknown alkane	A,P
		602	2.0	004	BBM	unknown phthalate, possibly butyl 2-methyl propyl	A,C,P
	0-1	606	0.7	004	BBM	unknown phthalate, possibly bis (2-methoxyethyl)	A,C,P
		610	1.3	004	BBM	nonanedioic acid, dibutyl ester	P
		611	0.4	004	BBM	unknown alkane	P
		616	0.6	004	BBM	unknown alkane	A,P
		621	0.4	004	BBM	unknown alkane	A,P
		628	6.4	004	BBM	not identified	A,P
		637	0.4	004	BBM	unknown alkene	A,P
	4-5			008	BEG		K
				010	BED		K

A - No positive identification
C - Plasticizer
P - Low concentration
K - None detected
* - Values reported are blank corrected.

Table 1-7-4. Tentative Identification of Nontarget Compounds Detected in Soils. Page 4 of 7.

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration (ppm)*	Sample Number	Lot	Best-fit Identification	Comments
10	0-1	605	0.8	002	BEU	hexadecanoic acid	P
		609	20	002	BEU	alkane greater than C20	P
		624	0.6	002	BEU	cholesta-4,6-dien-3-Ol-, benzoate	P
		628	0.6	002	BEU	cholest-5-en-3-Ol-, acetate	P
		629	0.8	002	BEU	decyl octyl phthalate	C,P
		632	0.4	002	BEU	not identified	A,P
		635	0.4	002	BEU	not identified	A,P
	4-5	73	4.2	002	BEU	1,1,2-trichloro-1,2,2-trifluoroethane	
		611	0.4	003	BBE	not identified	A,P
		617	0.6	003	BBE	not identified	A,P
		626	0.5	003	BBE	9-octadecenamide	P
				003	BEU		K
				004	BEU		K
				002	BDP		K
11	0-1						
	4-5						
	9-10	605	1.0	002	BDM	di-n-butyl phthalate	K
		636	0.5	003	BDP	alcohol greater than C ₁₇	C,P
				003	BDP		A,P
	9-10						
	14-15	524		003	BDM		K
		636		004	BDP		K
				004	BDP		K
	19-20	636	0.8	004	BDM	alcohol greater than C ₁₇	K
				005	BDP		A,P
				005	BDM		K
				006	BDP		K

A - No positive identification
C - Plasticizer
P - Low concentration
K - None detected
* - Values reported are blank corrected.

Table 1-7-4. Tentative Identification of Nontarget Compounds Detected in Soils. Page 5 of 7.

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration (ppm)*	Sample Number	Lot	Best-fit Identification	Comments
12	0-1	605	0.5	006	BED	hexadecanoic acid	K
	4-5	536	50	005	BEG	related to acetic acid, possibly the anhydride	
				007	BED	not identified	A
		540	10	007	BED	not identified	A,P
		542	5.0	007	BED	propane, 1-(1-ethoxyethoxy)	P
		544	0.6	007	BED	ethanol 2-(2-hydroxyethoxy)-, 1-nitrate	P
		546	0.8	007	BED	benzothiazole	P
		567	1.0	007	BED	acetamide, n-cyclohexyl	P
		571	0.8	007	BED	1,2-benzenedicarboxylic acid, butyl 2-methylpropyl ester	P
		602	3.0	007	BED	hexadecanoic acid	P
					BED	9-hexadecanoic acid	P
		605	2.0	007	BED	related to acetic acid	K
		613	2.0	007	BED	octanoic acid	A
					BEG	benzothiazole	P
		544	30	006	BED	not identified	A,P
7.5-8.5		561	1.0	008	BED	pentyl cyclopropane	A,P
		567	3.0	008	BED	trichlorinated unknown	P
		591	0.5	008	BED	benzothiazole	A,P
		605	1.0	008	BED	not identified	P
					BED	hexadecanoic acid	
					BEG	related to acetic acid	K
		545	30	007	BED	not identified	A,P
		554	3.0	009	BED	octanoic acid	A,P
		557	2.0	009	BED	pentyl cyclopropane	P
		562	2.0	009	BED	trichlorinated unknown	P
9-10		563	0.7	009	BED	benzothiazole	A,P
		567	3.0	009	BED	not identified	A,P
		571	0.3	009	BED	not identified	A,P
		584	0.5	009	BED	1,2-benzenedicarboxylic acid, bis(2-methoxyethyl) ester	P
		602	0.3	009	BED	hexadecanoic acid	P
					BED	2(3H)-benzothiazolethione	P
		605	1.0	009	BED	hexanedioic acid, dioctyl ester	P
		608	0.4	009	BED	alkene greater than C20	P
		627	10	009	BED		
		643	0.3	009	BED		

A - No positive identification

P - Low concentration

K - None detected

* - Values reported are blank corrected.

Table 1-7-4. Tentative Identification of Nontarget Compounds Detected in Soils. Page 6 of 7.

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration (ppm)*	Sample Number	Lot	Best-fit Identification	Comments
13	0-1 4-5			002	BED		K
				002	BEG		K
				003	BED		K
	9-10			003	BEG		K
				004	BED		K
	13-14			004	BEG		K
		605	0.5	005	BED	hexadecanoic acid	P
		610	0.9	005	BED	nonanediolic acid, dibutyl ester	P
14	0-1 4-5			008	BED	hexane	K
				006	BED		E, P
		102	1.1	009	BED		K
14	9-10			007	BED	tetradecanoic acid	K
		596	2.0	010	BED	pentadecanoic acid	P
		601	1.0	010	BED	not identified	P
		602	0.5	010	BED	hexadecanenitrile	A, P
		603	1.0	010	BED	not identified	P
		604	0.3	010	BED	9-hexadecanoic acid	A, P
		605	2.0	010	BED	hexadecanoic acid	P
		606	10	010	BED	nonanediolic acid, dibutyl ester	P
		610	2.0	010	BED	alkene C19	P
		611	0.8	010	BED	octadecanenitrile	P
		612	0.6	010	BED	cyclic alkane C20	P
		614	4.0	010	BED	octadecanoic acid	P
		615	3.0	010	BED	nonanamide	P
		615	1.0	010	BED	hexanediolic acid, bis(2-ethyl hexyl) ester	P
		624	0.4	010	BED	9-octadecenamide	P
		626	0.6	010	BED	hexanediolic acid, dioctyl ester	C
		627	40	010	BED	dioctyl phthalate	
		640	30	010	BED		
	14-15			002	BPP	nonanediolic acid, dibutyl ester	K
		610	0.4	004	BPD		P

A - No positive identification
C - Plasticizer
E - Suspected laboratory contaminant
P - Low concentration
K - None detected
* - Values reported are blank corrected.

Table 1-7-4. Tentative Identification of Nontarget Compounds Detected in Soils. Page 7 of 7.

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration (ppm)*	Sample Number	Lot	Best-fit Identification	Comments
14(cont'd)	19-20			003	BPP		K
				003	BPD		K
	24-25			004	BPP		K
				004	BPD		K
15	0-1	627	0.4	005	BGU	hexanedioic acid, dioctyl ester	P
	4-5			004	BGU		K
		602	0.4	006	BGU	1,2-benzenedicarboxylic acid, bis(2-methoxyethyl) ester	P
		605	0.9	006	BGU	hexadecanoic acid	P
	9-10			005	BGU		K
		627	0.5	007	BGU	hexanedioic acid, dioctyl ester	P

P - Low concentration
 K - None detected
 * - Values reported are blank corrected.

railroad track (Boring 10). This interval also contained methylisobutyl ketone in the target analyte fraction.

3.2.5 Phase I Contamination Assessment

Phase I samples from Site 1-7 contained methylisobutyl ketone, dieldrin, cadmium, chromium, copper, lead, zinc, arsenic, and mercury within or above their indicator levels.

In samples of the alluvium, all of the detected target analytes above indicator levels were found in or near the west yard of Site 1-7, or under the overhead pipeline connecting the two yards. In these samples, methylisobutyl ketone and dieldrin were the only target organic compounds found, and lead, zinc, and arsenic were the only metals at levels above their indicator ranges.

Methylisobutyl ketone was found slightly above its indicator level in a single near-surface sample located beneath the railroad track and near the loading dock (Boring 10), but not in the other parts of the west yard or farther east on the same railroad tracks. Therefore, the lateral extent of this compound is confined to the northwestern part of the west yard. Its vertical extent is near-surface since it was not found in the 9 to 10 ft interval. The presence of this compound is unexplained by the known history of the site.

Dieldrin was found just above its indicator level in a single surface sample that was collected from a ditch in the northwestern corner of the site (Boring 1), but not in deeper samples or in any other borings. This dieldrin concentration may be related to a regional pattern of potential contamination in and around the South Plants manufacturing complex, as the known history of this site does not include the presence of any pesticides.

Lead was found above its indicator range in surface samples from two borings. One of these elevated lead concentrations (Boring 1) is below the ditch at the northwestern corner of the site, and the other (Boring 7) is under the overhead piping between the east and west yards. Lead was not

found in any of the borings between these two, so its lateral extent is probably local at both borings.

Zinc was above its indicator range in the surface or near-surface samples from three borings in the western part of the site (Borings 1, 11, and 12), and was within its indicator range in six other alluvial samples in the western and central part of the site. These borings containing elevated zinc levels were drilled in a variety of areas around the west yard, including a ditch, the railroad track, by the loading dock, and below an asphalt pad.

Arsenic was above its indicator range only in a single sample, which was taken from the near-surface interval of the alluvium in the west yard (Boring 12). Arsenic was found within its indicator range in three borings along the railroad track, but not in borings between the track and the hit in the west yard. The only other arsenic detected was in a boring in the ditch that drains to the south from the west yard. Since the arsenic concentration in this ditch is well within the indicator range for arsenic, the extent of potential arsenic contamination is considered to be limited to the area surrounding Boring 12.

In bedrock samples, the only target analytes found above their indicator levels were copper and zinc, but copper and zinc were detected above their indicator ranges in nearly all of these bedrock samples. In the bedrock, the highest concentration of copper was 81 ug/g and of zinc was 120 ug/g. Because these levels were consistent from one bedrock sample to the next, these levels may be naturally occurring, and their vertical and lateral extents have been adequately defined by the Phase I program.

The relatively high concentrations in Boring 4 of a tentatively identified nontarget ester, acid, and phthalate warrant further investigation. Tentatively identified benzothiazole and elevated levels of an unidentified compound related to acetic acid occurred in Boring 12, in the west yard. Boring 12 also contained the green sample discussed in Section 3.2.2. Benzothiazole is used in dye and chemical manufacturing, and may be an

indication of contamination in this boring. The concentrations of the tentatively identified acetic acid related compound and benzothiazole warrant further investigation.

Although the organic ester and acid tentatively identified in Boring 14 are considered natural compounds and the possible dioctyl phthalate in that boring is a plasticizer that occurs commonly, the somewhat elevated concentrations of these compounds warrant further investigation.

The compound tentatively identified as 1,1,2-trichloro-1,2,2-trifluoroethane in Boring 10 is a fluorocarbon, a class of low toxicity, ubiquitous chemicals commonly used as aerosol propellants, refrigerants, solvents, lubricants, and fire retardants. This particular compound is often used in fire extinguishers. Its presence does not warrant further investigation; however further sampling and analysis for other compounds in this area is planned because of the methylisobutyl ketone found in the same sample.

The semivolatile method, although not certified for volatile compounds, has been shown to be capable of detecting tetrachloroethylene, toluene, chlorobenzene, ethylbenzene, and xylenes in the nontarget fraction. The absence of these compounds in the nontarget results for this site is an indication that there is no contamination present from these compounds.

No hydrazines or nitrosamines were detected in soils samples from this site, and none of the other related chemicals listed in Section 2.0 were identified in the nontarget fraction. Instead, only a few samples contained isolated occurrences of target and nontarget compounds that are seemingly unrelated to the known possible uses of the site. While these occurrences were shown to be local and largely confined to the alluvium, a Phase II program is proposed for this site. Part of this sampling is proposed to further assess the methylisobutyl ketone, dieldrin, lead, zinc, and arsenic in the alluvium of the west yard, and selected compounds tentatively identified in Borings 4, 12, and 14, which contained relatively high concentrations of tentatively identified phthalates and natural organic esters and acids, or contained tentatively identified benzothiazole, a chlorinated unknown, and

hydrocarbons. Only in Boring 12 does this recommended Phase II sampling extend into the bedrock. Besides these borings to investigate hits in the Phase I borings, some additional sampling is proposed to investigate other specific areas not drilled in Phase I, as detailed in Section 3.3.

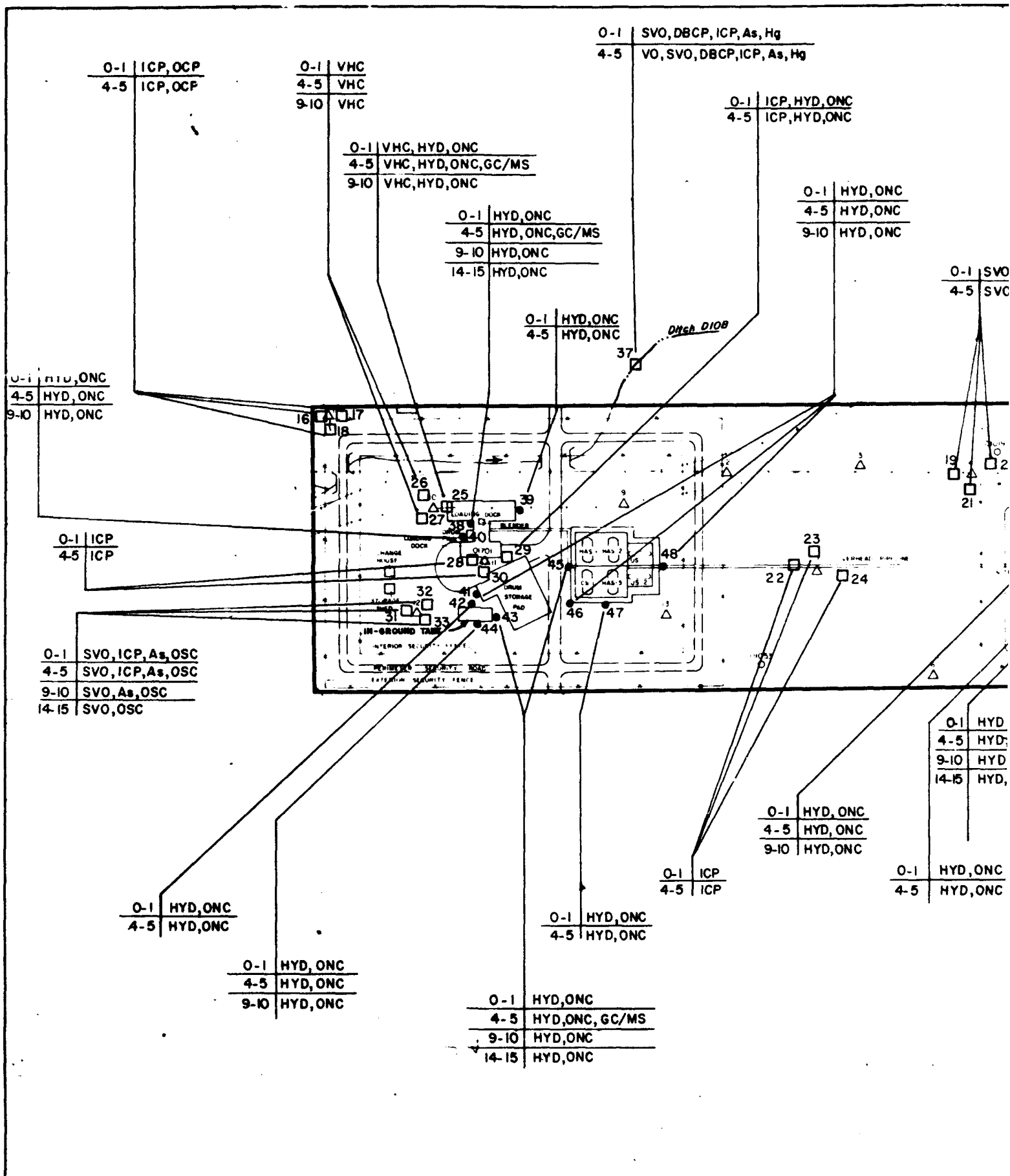
3.3 PHASE II PROGRAM

Although a worst-case estimate of potential contamination at Site 1-7 has been delineated by the Phase I program, additional sampling is proposed to further define local occurrences of potential contamination within the site and to assess the presence of hydrazines and nitrosamines in specific areas not sampled during Phase I.

The objectives of the Phase II soil sampling plan for Site 1-7 are to assess:

- o The presence of dieldrin, lead, and zinc near Boring 1;
- o The identification or confirmation of the nontarget compounds tentatively identified in Boring 4;
- o The extent of lead near Boring 7;
- o The presence of methylisobutyl ketone identified in Boring 10;
- o The lateral and vertical extent of zinc near Boring 11;
- o The lateral and vertical extent of arsenic and zinc, and the identification or confirmation of the nontarget compounds, including benzothiazole, tentatively identified in Boring 12;
- o The identification or confirmation of the nontarget compounds tentatively identified in Boring 14;
- o The presence of any Phase I analytes in the surface and near-surface intervals beneath ditch D10B; and
- o Whether hydrazines or nitrosamines are present in some specific areas adjacent to some of the structures at the site.

This Phase II sampling program is described below and illustrated in Figure 1-7-7.

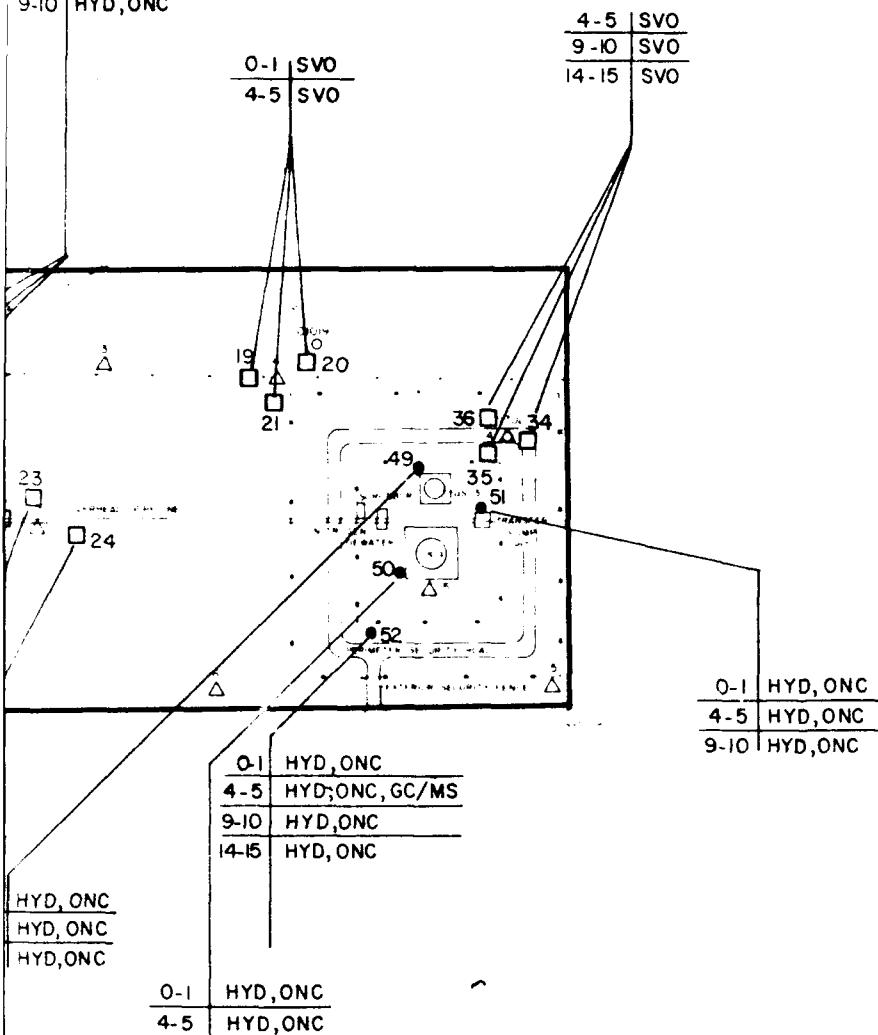


HYD, ONC
HYD, ONC

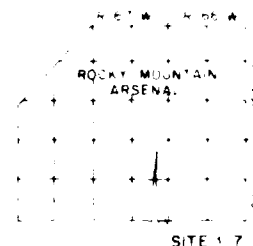
0-1 HYD, ONC
4-5 HYD, ONC
9-10 HYD, ONC

0-1 SVO
4-5 SVO

4-5 SVO
9-10 SVO
14-15 SVO



LEGEND



VO Volatile organics
SVO Semivolatile organics
DBCP Dibromochloropropane
ICP ICP Metals
As Arsenic
Hg Mercury
VHC Volatile hydrocarbon compounds
OSC Organosulfur compounds
HYD Hydrazines (by GC)
ONC Nitrosamines (by GC)
GC/MS GC/MS verification

Sampling Interval (feet) Analysis
0-1 HYD, ONC

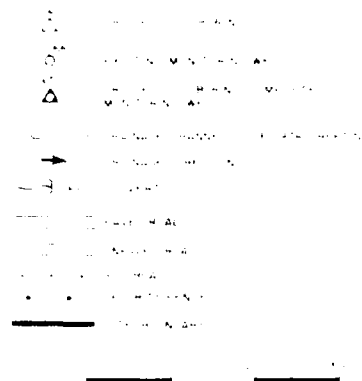


Figure 1-7-7

PROPOSED PHASE II BORINGS AND SAMPLING PLAN

SITE 1-7
Rocky Mountain Arsenal, Task 11
Prepared by Geraghty & Miller, Inc.
for Ebasco Services, Inc.

Prepared For:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

Because the target compounds in Boring 1 were found only in the surface interval below a ditch, Phase II sampling there is proposed upgradient in the bottom of the drainage and on the sides of the drainage. Samples will be taken from the 0 to 1 and 4 to 5 ft intervals of three Phase II borings (Borings 16, 17, and 18) in this ditch and analyzed for ICP metals and organochlorine pesticides (OCP).

Additional samples will be taken where nontarget compounds were found in the surface interval of Boring 4. One of the Phase II borings (19) will be drilled on the same railroad track, and two others (20, 21) will be drilled to the sides of the track. Samples will be collected from the 0 to 1 and 4 to 5 ft intervals and analyzed for semivolatile organic compounds (SVOC).

Three additional borings are proposed where lead was found above its indicator range at the surface in Boring 7. One boring (22) will be drilled under the same overhead pipeline, preferably under a section of pipe where any leakage might have occurred, and two borings (23, 24) will be drilled to the side of the pipes. Samples will be collected from the surface and near-surface intervals of these borings and analyzed for ICP metals.

Where methylisobutyl ketone was detected below the railroad track near the loading dock, one additional boring (25) will be drilled on the tracks and two (26, 27) will be drilled to the side. These borings will be drilled to 10 ft and analyzed for volatile hydrocarbon compounds (VHC).

Where zinc was above its indicator range at the surface in Boring 11, surface and near-surface samples will be collected from three additional borings (28, 29, 30) in this area. These samples will be analyzed for ICP metals.

Around Boring 12 in the west yard, three additional borings (31, 32, 33) will be drilled to 15 ft. The surface and near-surface samples will be analyzed for ICP metals and arsenic (As) to assess the extent of zinc and arsenic found in the alluvial samples from this boring. Samples from the surface to the water table (expected at 15 ft) will also be analyzed for organosulfur compounds (OSC) to assess the tentatively identified benzothiazole and for semivolatile organics to assess the extent of other nontarget compounds found in Boring 12.

Three additional borings will be drilled around Boring 14 where hydrocarbons and organic acids and esters were tentatively identified in the 9 to 10 ft interval. One boring (34) will be drilled on the road where Boring 14 was drilled, and the others (35, 36) will be drilled at the sides of the road. Samples from between 4 and 15 ft in those borings will be analyzed for semivolatile organics.

One boring (37) will be drilled in ditch D10B, and surface and near-surface samples from that boring will be analyzed for Phase I analytes. This boring may be drilled outside of the site where the ditch trace still is visible.

Additional sampling and analysis are proposed to assess the presence of hydrazines and nitrosamines in areas adjacent to certain structures at Site 1-7. For this program, GC analytical methods with lower detection limits are being developed and certified for hydrazines and nitrosamines. Some of the additional analyses will be conducted on samples from Boring 25 by the loading dock and Boring 29 between the loading dock and drum storage pad. Other borings (38-52) will be drilled to depths ranging from 5 to 15 ft (or to the water table) near the loading docks, blender, drum filling station, drum cleaning shed, drum storage pad, in-ground tank, and west and east yard diked areas around storage tanks. These borings will be sampled at the 0 to 1, 4 to 5, 9 to 10 and 14 to 15 ft intervals. The number, depths, and locations of these borings may be changed to evaluate areas of potential leakage, overflow, or accumulation according to information that may be obtained from study of aerial photographs and from site inspection. This program may also be revised depending on the interim remedial action developed for this site. The number of borings and samples to be taken at specific depths in the Phase II study are tabulated below.

<u>Number of Borings</u>	<u>Depth (ft)</u>	<u>Number of Samples</u>
17	5	34
10	10	30
10	15	37

Thirty-seven additional borings yielding 101 samples are proposed for the Phase II program. The locations of the borings and the proposed analyses are shown in Figure 1-7-7. The number of samples to be tested by each analytical method is listed below.

<u>Analytical Method</u>	<u>Number of Samples</u>
Volatile hydrocarbon compounds (VHC)	9
Semivolatile organics (SVO)	29
Organochlorine pesticides (OCP)	6
Organosulfur compounds (OSC)	12
Dibromochloropropane (DBCP)	2
Hydrazines (HYD)	50
Nitrosamines (ONC)	50
ICP metals	26
Arsenic (As)	11
Mercury (Hg)	2
GC/MS verification (GC/MS)	5

The analytical methods proposed to be used in this Phase II program are designed or will be developed to be analyte specific, use GC techniques with specific detectors, and have detection limits much lower than the Phase I methods. However, because the GC/MS scan is considered to offer a greater level of confidence in compound identification, 10 percent of the samples submitted for Phase II organic analyses will be subject to GC/MS verification. Because a GC/MS method for semivolatile organics will be used to analyze all samples from Borings 31-36, well over 10 percent of the samples proposed for organic analyses from Borings 16 through 37 will be analyzed by a GC/MS method. In addition, GC/MS verification will be done on samples from the 4 to 5 ft interval of Borings 25, 38, 43, 45, and 52.

The draft final version of this report was sent to the Colorado Department of Health (CDH), Shell Oil Company, and the U.S. Environmental Protection Agency on January 20, 1988. Comments were received from Shell on February 18, 1988, and from CDH on March 16, 1988. EPA comments are an integral part of the report review process and previously have been incorporated into the report, and

written EPA comments were received on August 13, 1988. The comments received have been considered in the preparation of this final report. Comments and responses are provided in Appendix 1-7-C.

3.4 QUANTITY OF POTENTIALLY CONTAMINATED SOIL

Site 1-7 was originally considered to be a contaminated site. The following estimates of the extent of potentially contaminated soil were originally calculated in RMACCPMT (1984/RIC 84034R01):

Areal Extent = 691,200 ft²
Vertical Extent = 3 ft
Volume = 77,000 cubic yards (yd³)

Based on the results of the Phase I investigation, the quantity of potentially contaminated soil within Site 1-7 has been revised to 190,000 yd³. This volume, which is illustrated in Figure 1-7-8, is calculated as follows.

Because of the nontarget compounds tentatively identified in Boring 14, area A is assumed to be potentially contaminated to a depth of 14 ft, which is the top of the next sampling interval, and also approximately the depth to the water table. This area is bounded by lines through Borings 9 and 10, which were clean in the 9 to 10 ft interval. Area A has dimensions of 320 X 340 ft and is potentially contaminated to a depth of 14 ft, yielding a volume of 56,000 yd³.

Similarly, due to tentatively identified nontarget compounds in Boring 14, area B is considered to be potentially contaminated to a depth of 14 ft, which is the top of the next deeper clean sample. Area B is bounded by lines through Borings 4 and 15, which were clean in the 9 to 10 ft interval. This area has dimensions of 340 X 380 ft, for a potentially contaminated volume of 67,000 yd³.

Since methylisobutyl ketone was found in the 4 to 5 ft interval of Boring 10, area C is assumed to be potentially contaminated to 9 ft, the top of the next clean sample in that boring. This area is bounded by area A, in which potential contamination is assumed to extend deeper, and by lines through Borings 9 and 11, which were clean in the 4 to 5 ft interval. The resulting area is 130,000 ft², giving a potentially contaminated volume of 43,000 yd³.

Potential contamination of the surface sample by lead in Boring 7 causes area D to be considered potentially contaminated to a depth of 4 ft, the top of the next clean sample. Area D is bounded by areas A, B, and C, and by lines through clean Borings 3, 9, and 13. This area encompasses $190,000 \text{ ft}^2$, for a potentially contaminated volume of $28,000 \text{ yd}^3$.

The other two areas in Site 1-7 are uncontaminated. Summing the potentially contaminated volumes beneath Areas A through D yields a total of $190,000 \text{ yd}^3$.

Results from the Phase I survey were used to generate a most conservative (worst-case) estimate of the volume of potentially contaminated soil at Site 1-7. This delineation of the boundaries of potential contamination should not be construed to indicate the actual presence of contamination within the volumes outlined. In addition, this approach is not intended to imply that any or all of the soil within the potentially contaminated volume must be remediated, nor does it make any assumption about the type of remediation that may be required. Rather, this approach is intended to provide preliminary estimates of the maximum possible volume of contaminated materials for planning purposes only.

4.0 REFERENCES CITED

- Ackerman, J.O. 1960, September 29. Memorandum to commanding officer, RMA, re: disposal of waste from hydrazine mixing plant. Corps of Engineers. Microfilm RMA069, Frame 0381.
- Barbieri, G.L. 1977, August 17. Disposition form with attachments to chief, plant operations, RMA, cost estimates-hydrazine plant update. Microfilm RMA094, Frames 1152-1155, 1154.
- Barbieri, G.L. 1980, November 26. Memorandum for record, re: hydrazine plant-hazardous study-MCE. Microfilm RMA081, Frames 2439-2440.
- Barbieri, G.L. 1981a, October 5. Memorandum for record, re: hydrazine plant-waste water alternatives, Rocky Mountain Arsenal. Microfilm RMA094, Frame 0393.
- Barbieri, G.L. 1981b, December 21. Telex to commander, SA-ALC, Kelly AFB, hydrazine waste, Rocky Mountain Arsenal. Microfilm RMA228, Frames 0338-0339.
- Barbieri, G.L. 1982, February 3. Disposition form to director, installation services, RMA, hydrazine waste line, Rocky Mountain Arsenal. Microfilm RMA124, Frame 1431.
- Barbieri, G. 1985. Personal communication to G. Brad beer, Geraghty & Miller, Inc.
- Barbieri, G. and D. Strang. 1961. Hydrazine blending facility maps. Omaha District COE and RMA.
- Boyle, R.E. 1975. Minutes of meeting: Toxic hazards & related problems of hydrazine fuels, 8-10 December 1975, Brooks AFB, Texas. Product & Environmental Assurance Directorate, RMA. Microfilm RMA023, Frames 0346-0349.
- RIC 81266R27
- Broughton, J.D., W.L. Miller, and G.B. Mitchell, 1979. Geology and groundwater definition, Basin A area, Rocky Mountain Arsenal, Commerce City, Colorado. USAEWES.
- Butoff, V.T. 1972, July 27. Letter to directorate of aero space fuels, Kelly AFB, re: billing for blending of JPX, Rocky Mountain Arsenal. Microfilm RMA152, Frame 0585.
- Byrne, J.P. 1976a, August 23. Disposition form with attachments, environmental differential pay evaluation. Microfilm RMA228, Frames 1046-1052, at 1047.
- Byrne, J.P. 1976b, November 24. Letter to W.E. Eicher, U.S. Army Armament Command, Rock Island, re: hydrazine and UDMH fuel blending and storage facility. Microfilm RMA081, Frames 0353-0354.

CAPS (Colorado Aerial Photo Service). 1951, March 25. Aerial photographs of RMA. Negative No. 29-A-6, Denver, Colorado.

CAPS. 1962, August 11. Aerial photographs of RMA. Negative No. 114-135, Denver, Colorado.

CAPS. 1968, April 11. Aerial photograph of RMA. Negative No. 132-360, Denver, Colorado.

CAPS. 1975, October 15. Aerial photograph of RMA. Negative No. 142-108, Denver, Colorado.

CAPS. 1976, April 24. Aerial photograph of RMA. Negative No. 143-26, Denver, Colorado.

CAPS. 1978, October 15. Aerial photograph of RMA. Negative No. 148-74. Denver, Colorado.

CAPS. 1982, August 16. Aerial photograph of RMA. Negative No. 51, Denver, Colorado.

Cook, D.W. 1976, October 27. Memorandum for the record, re: exit interview, CPT Glenn L. Cook, AEHA Ind Hygiene Div-Monitoring Hydrazine & UDMH of the RMA Hydrazine Facility, U.S. Army, Edgewood Arsenal. Microfilm RMA023, Frames 0326-0327.

Dept. of the Army. 1975. Hydrazine area, Bldg. 758, plan and details. E4-72-4 and E4-72-8.

Donaghe, L. 1980a, July 8. Building survey Rocky Mountain Arsenal, Tank 463D. Microfilm RMA182, Frame 1422.

Donaghe, L. 1980b, July 11. Building survey Rocky Mountain Arsenal, Tank 805. Microfilm RMA182, Frame 1590.

Donaghe, L. 1980c, July 18. Building survey Rocky Mountain Arsenal, Building 755. Microfilm RMA182, Frame 1572.

Donaghe, L. 1980d, July 18. Building survey Rocky Mountain Arsenal, Building 756. Microfilm RMA182, Frame 1573.

Donaghe, L. 1980e, July 18. Building survey Rocky Mountain Arsenal. Building 758. Microfilm RMA182, Frame 1575.

Donaghe, L. 1980f, July 18. Building survey Rocky Mountain Arsenal. Building 759. Microfilm RMA182, Frame 1576.

Donaghe, L. 1980g, July 18. Building survey Rocky Mountain Arsenal. Building 760. Microfilm RMA182, Frame 1577.

Donaghe, L. 1980h, July 18. Building survey Rocky Mountain Arsenal.
Building 761. Microfilm RMA182, Frame 1578.

Donaghe, L. 1980i, July 18. Building survey Rocky Mountain Arsenal.
Building T-868C. Microfilm RMA182, Frame 1611.

Donnelly, G.F. 1975a, March 20. Letter to HQ, Air Force Logistics Command.
Cost estimates for P-341 project, SA 118-5, security fence and hydrazine
plant addition, and SA 119-5, liquid fuel storage, Rocky Mountain Arsenal,
Rocky Mountain Arsenal. Microfilm RMA056, Frames 1221-1225, 1224.

Donnelly, G.F. 1975b, May 5. Disposition form to Chief, procurement division,
hydrazine plant improvement projects, Rocky Mountain Arsenal. Microfilm
RMA056, Frame 1153.

Donnelly, G.F. 1975c, October 7. Telex to director, aero space fuels, Kelly
AFB, UDMH storage facility, Rocky Mountain Arsenal. Microfilm RMA056,
Frame 1139.

RIC 86238R03

Ebasco (Ebasco Services, Incorporated). 1986, March. Final technical plan,
task no. 11, hydrazine blending and storage facility. Contract no.
DAAK11-84-D-0017. Prepared for Program Manager's Office for Rocky
Mountain Arsenal Contamination Cleanup.

Ebasco. 1988, January. Draft final contamination assessment report,
Site 1-7, hydrazine blending and storage facility, version 2.2, pp. 12-14.

RIC 88204R02

ESE (Environmental Science and Engineering). 1987. Draft final introduction
to the contamination assessment reports. RMA. Prepared for Program
Manager's Office for Rocky Mountain Arsenal Contamination Cleanup.

ESE. 1987. Computer database of groundwater analytical results.

Esquibel, N. 1969, March 18. Memorandum for record, re: JPX orders for
March 1969, Rocky Mountain Arsenal. Microfilm RMA250, Frame 0369.

Esquibel, N. 1970, April 6. Disposition form to Chief, product division,
RMA; order for JPX, Rocky Mountain Arsenal. Microfilm RMA250, Frame 0364.

Esquibel, N. 1971a, February 19. Disposition form to Chief, production
division, RMA; order for JPX, Rocky Mountain Arsenal. Microfilm RMA250,
Frame 0366.

Esquibel, N. 1971b, March 16. Disposition form to Chief, product division,
RMA; order for JPX, Rocky Mountain Arsenal. Microfilm RMA250, Frame 0367.

Esquibel, N. 1971c, May 20. Disposition form to Chief, product division,
RMA; order for JPX, Rocky Mountain Arsenal. Microfilm RMA250, Frame 0355.

Esquibel, N. 1972, June 24. Disposition form to Chief, product division, RMA; order for JPX, Rocky Mountain Arsenal. Microfilm RMA250, Frame 0351.

Esquibel, N. 1985, August 22. Juris deposition, v. 1, pp. 35-38. Juris Computer Database.

Feller, D.R. 1979, February 5. Letter with attachment to J. Melito, Rocky Mountain Arsenal, re: Project P-341, modify hydrazine fuel facility (RMA), USAF. Microfilm RMA094, Frames 0583-0596, at 0587-0588.

RIC 86107R01

Geraghty & Miller, Inc. 1986, April. Rocky Mountain Arsenal chemical index, draft final report. Prepared for Program Manager's Office for Rocky Mountain Arsenal Contamination Cleanup.

Glenn, L.L. 1967, May 23. Letter with attachment to G.F. Donnelly, RMA, re: JPX mix. Department of the Air Force, Kelly AFB. Microfilm RMA069, Frames 0266-0267.

Harris, A.T. 1982, December 29. Memorandum to record, re: hydrazine event, Rocky Mountain Arsenal. Microfilm RMA081, Frame 0105.

Hawley, G.G. 1981. The condensed chemical dictionary, tenth edition. New York: Van Nostrand Reinold Company.

HDOA (Headquarters-Department of the Army). 1976. Technical manual, detector kit, chemical agent, ABC-M18A2. TM3-6665-254-12.

Heim, D.L. 1982, February 19. Disposition form to Chief, industrial division, RMA; hydrazine waste line, Rocky Mountain Arsenal. Microfilm RMA124, Frame 1431.

Jacobs, S.G. 1985, July 22. Juris deposition, v. 2, pp. 206-208. Juris Computer Database.

James, T.C. 1986, February 20. Disposition form; hazardous waste, Rocky Mountain Arsenal. Microfilm RMA288, Frame 0694.

James, T. 1987. Personal communication to M. Schultz, Envirosphere.

Kim, S. 1981, October. Hazard analysis for hydrazine, UDMH and Aerozine-50 storage and blending facility at Rocky Mountain Arsenal, Rocky Mountain Arsenal. Microfilm RIA025, Frames 1209-1239, at 1210-1211.

RIC 81266R34

Kolmer, J. R. 1975. Analysis of exploratory drilling data, Rocky Mountain Arsenal, Colorado. RMA.

RIC 81295R07

Kolmer, J.R. and G.A. Anderson. 1977, July. Installation restoration of RMA, Part I-Pilot containment operations final Environmental Impact Statement. Department of the Army.

Kuznear, C. and Trautmann, W.L. 1980, September. History of pollution sources and hazards at Rocky Mountain Arsenal, p. 54. Microfilm RSH913, Frames 0525-0614, 0585.

Long, A.T. 1960, November 14. Disposition form to Chief, chemical office, Department of the Army, UDMH and hydrazine mixing facility; Chief, preventive medicine division, Department of the Army. Microfilm RMA069, Frame 0387.

Loven, C.G. 1975, November 25. Report, form DD-173, to commander, Kelly AFB; report of incident involving USAF hydrazine facility at RMA, Rocky Mountain Arsenal. Microfilm RMA245, Frames 2066-2067.

Lyman, W.J., W.F. Reehl, and D.H. Rosenblatt. 1982. Handbook of chemical property estimation methods; environmental behavior of organic compounds. New York: McGraw Hill Book Co.

Lynes, M.C. 1985, November 6. Juris deposition, v. 3, pp. 438-440. Juris Computer Database.

RIC 82295R01

May, J.H. 1982. Regional groundwater study of Rocky Mountain Arsenal, Colorado: Report #1, hydrogeological definition. USAEWES.

RIC 83299R01

May, J.H. J.D. Crabtree, R.W. Hunt, and W.L. Murphy. 1983. Hydrogeology of Basin A/South Plants area, Rocky Mountain Arsenal, Colorado, Phase I. USAEWES.

McNeill, W. 1982, January 26. Disposition form to command office, RMA; hydrazine waste, Rocky Mountain Arsenal. Microfilm RMA124, Frame 1532.

Melito, J. 1978, May 8. Memorandum for record, re: procedures for treating the hydrazine waste pit, Rocky Mountain Arsenal. Microfilm RMA081, Frames 0330-0332.

Melito, E. 1985, September 4. Juris deposition, v. 1, pp. 85-86. Juris Computer Database.

Morstedt, C.S., et al. 1977. Safety Survey of the UDMH/hydrazine blending and storage facility. RMA Safety Survey Team. Microfilm RMA023, Frames 0227-0234.

RIC 81266R68

PMCDIR (Program Manager for Chemical Demilitarization Installation Restoration). 1977. Installation assessment of RMA records evaluation report #107, Volumes I, II & Appendices. Edgewood.

Queen, W.G. 1975, May 5. Letter to chairman, department of defense explosive safety board, re: request for site plan approval for UDMH storage tanks; chief, safety office. Microfilm RMA056, Frame 1146.

RIC 82096R01

Resource Consultants, Inc. 1982, March. Surface water hydrologic analysis, Rocky Mountain Arsenal, Commerce City, Colorado. Stearns-Roger and USATHAMA.

Rock, A.H. January 28, 1974. Disposition form to director of mustard demil, RMA; monthly safety inspection, area inspected-hydrazine facility, Buildings 755, 756, and T-868, Rocky Mountain Arsenal. Microfilm RMA229, Frames 0945-0946.

Rock, A.H. 1975, November 25. Disposition form to director of phosgene demilitarization, Rocky Mountain Arsenal; safety criteria for UDMH storage facility, Rocky Mountain Arsenal. Microfilm RMA217, Frames 0746-0747.

Rock, A.H. 1976, May 28. Disposition form to Chief, phosgene division; monthly safety inspection, Rocky Mountain Arsenal. Microfilm RMA081, Frames 0400-0401.

RMA (Rocky Mountain Arsenal). 1945a, August 15. History of Rocky Mountain Arsenal, photograph I-8-3- aerial view - Plants Area - looking southwest - July 7, 1943 (01.23-333E-BFP 7-7-43, 30x12 - 9000). Microfilm RMA188, Frame 0593.

RMA. 1945b, August 15. History of Rocky Mountain Arsenal, photograph I-1A-3- aerial view - Arsenal area - looking west, August 15, 1945. Microfilm RMA188, Frame 0054.

RMA. 1945c, August 15. History of Rocky Mountain Arsenal, photograph I-8-2 - aerial view - plants area - looking east, August 15, 1945. Microfilm RMA188, Frame 0598.

RMA. 1945d. History of Rocky Mountain Arsenal, v. 7, parts 6 and 7, pp. 2311, 2353-2356. Microfilm RMA189, Frames 0892, 0934-0937.

RMA. 1945e. History of Rocky Mountain Arsenal, v. 9, part 7. Microfilm RMA189, Frames 1690, 1694, 1769.

RMA. 1945f, August 27. Plot plan, I.O.B. area sewerage facilities. Drawing No. D-676C. Group No. 13-35.

RMA. 1948, April 25. Plot plan, Rocky Mountain storage area, empty ton container storage area. Drawing No. D2-7-1, Group No. 35-27.

RMA. 1950, October 26. Plot plan, goop drum storage proposed plot plan and stacking details. Drawing No. E2-7-4, Group No. 35-28.

RMA. 1960a, August 6. Plot plan, UDMH hydrazine mixing facility concrete pad plan section and details. Drawing No. E3-72-1A, Group No. 23-51.

RMA. 1960b, August 29. Plot plan, waste effluents treatment facilities, clear water storage tank. Drawing No. 26-12-01, Group No. 16-46.

RMA. 1960c, August 30. Plot plan, UDMH-hydrazine mixing facility steam line stanchion plan, evaluation and detail. Drawing No. E3-72-4, Group No. 23-50.

RMA. 1960d, September 2. Plot plan, hydrazine area hot water piping to hydrazine blender. Drawing No. E5-72-3, Group 31-23.

RMA. 1960e, September 20. Plot plan, UDMH-hydrazine change house-Building 755 plumbing and piping. Drawing No. E5-72-5, Group 31-23.

RMA. 1960f, September 20. Plot plan, hydrazine blending facility steam and water piping in change house. Drawing No. E5-72-7, Group 31-27.

RMA. 1960g, October, 17. Plot plan, UDMH-hydrazine mixing facility Building 755 change house electrical system. Drawing No. E4-72-3, Group 29-24.

RMA. 1960h, December 31. History of Rocky Mountain Arsenal, October 1, 1960 through December 31, 1960. Microfilm RMA199, Frames 1222-1225.

RMA. 1961a, June 30. History of Rocky Mountain Arsenal, April 1, 1961 through June 30, 1961. Microfilm RMA194, Frames 1367-1368.

RMA. 1961b, September 30. History of Rocky Mountain Arsenal, July 1, 1961 through September 30, 1961. Microfilm RMA194, Frame 1455.

RMA. 1961c, December 31. History of Rocky Mountain Arsenal, October 1, 1961 through December 31, 1961. Microfilm RSA014, Frame 1730.

RMA. 1962a, March 31. History of Rocky Mountain Arsenal, January 1, 1962 through March 31, 1962. Microfilm RMA194, Frames 1622-1625.

RMA. 1962b, September 30. History of Rocky Mountain Arsenal, July 1, 1962 through September 30, 1962. Microfilm RMA194, Frame 1768.

RMA. 1964a, June 30. History of Rocky Mountain Arsenal, January 1, 1964 through June 30, 1964. Microfilm RMA194, Frame 2134.

RMA. 1964b, December 31. History of Rocky Mountain Arsenal, July 1, 1964 through December 31, 1964. Microfilm RMA195, Frames 0024, 0060.

RMA. 1965a, June 30. History of Rocky Mountain Arsenal, January 1, 1965 through June 30, 1965. Microfilm RMA195, Frames 0173-0174.

RMA. 1965b, December 31. History of Rocky Mountain Arsenal, July 1, 1965 through December 31, 1965. Microfilm RMA195, Frame 0292.

RMA. 1966a, June 30. History of Rocky Mountain Arsenal, January 1, 1966 through June 30, 1966. Microfilm RMA195, Frame 0398.

RMA. 1966b, December 31. History of Rocky Mountain Arsenal, July 1, 1966 through December 31, 1966, p. 43. Microfilm RMA195, Frame 0538.

- RMA. 1967a, June 30. History of Rocky Mountain Arsenal, January 1, 1967 through June 30, 1967. Microfilm RMA195, Frame 0667.
- RMA. 1967b, December 31. History of Rocky Mountain Arsenal, July 1, 1967 through December 31, 1967. Microfilm RMA195, Frame 0826.
- RMA. 1968a, June 30. History of Rocky Mountain Arsenal, January 1, 1968 through June 30, 1968. Microfilm RMA195, Frame 1002.
- RMA. 1968b, December 31. History of Rocky Mountain Arsenal, July 1, 1968 through December 31, 1968. Microfilm RMA195, Frame 1253.
- RMA. 1969, June 30. History of Rocky Mountain Arsenal, January 1, 1969 through June 30, 1969. Microfilm RMA195, Frame 1376.
- RMA. 1970, June 30. History of Rocky Mountain Arsenal, July 1969 through June 1970. Microfilm RMA195, Frame 1510.
- RMA. 1971, June 30. History of Rocky Mountain Arsenal, July 1, 1970 through June 30, 1971. Microfilm RMA195, Frame 1700.
- RMA. 1972a, March 24. Standing operating procedure for hydrazine, UDMH, aerazine storage and blending facility. Microfilm RMA229, Frames 1166-1167.
- RMA. 1972b, June 30. History of Rocky Mountain Arsenal, July 1, 1971 through June 30, 1972, p. 38. Microfilm RMA196, Frame 0054.
- RMA. 1975a, March 10. Plan, hydrazine plant Building 758, storage tanks No. 463D and 805, relocation of storage tanks. Drawing No. E3-72-4, Group No. 23-50.
- RMA. 1975b, March 11. Plan, hydrazine plant Building No. 758, storage tanks No. 463D and 805, plan, elev., sec. and details. Drawing No. E3-72-2, Group No. 23-51.
- RMA. 1975c, March 11. Plan, hydrazine plant Building 758 storage tanks No. 463 and 805, safety, ladder for tank 463D, plan view sections. Drawing No. E3-72-3, Group No. 23-51.
- RMA. 1975d, March 11. Site plan-hydrazine plant and storage area security improvements and building additions site plan, fencing and roads. Drawing No. E3-72-5.
- RMA. 1975e, March 11. Plot plan, hydrazine plant and storage area security improvements and building additions, reinforced concrete floor Buildings 759, 760, 761 and Section. Drawing No. E3-72-5, Group No. 31-23.
- RMA. 1975f, March 18. Plan, hydrazine plant Building 758, storage tanks No. 463D and 805, UDMH-hydrazine transfer and vent system and nitrogen piping installation. Drawing No. E5-72-17, Group No. 10-20.

RMA. 1976a, January 7. Partial list of uncompleted work at old plant causing leaks. Microfilm RMA023, Frame 0350.

RMA. 1976b, May 5. Sketch, hydrazine plant scrubber vapor vent system. Drawing No. E10-72-11, Group No. 23-24.

RMA. 1976c, September 30. History of Rocky Mountain Arsenal, July 1, 1975 through September 30, 1976, pp. 96-97. Microfilm RMA196, Frames 0650-0651.

RMA. 1977, September 30. History of Rocky Mountain Arsenal, October 1, 1976 through September 30, 1977, p. 66. Microfilm RMA196, Frame 0739.

RMA. 1978a, May 11. Military construction project data, DD form 1391, P341, Project SA-156-8, modify hydrazine fuel facility (RMA). Microfilm RMA099, Frames 0487-0488.

RMA. 1978b, November 1. SOP No. SARRM-O-H-13; hydrazine, UDMH, and aeroxine operations-storing, blending and filling. Microfilm RIA012, Frames 1249-1321, at 1319.

RMA. 1979, November 22. Report: hydrazine fuel facility safety site plant narrative. Microfilm RMA081, Frames 2249-2253, 2251.

RMA. 1980, May. History of Rocky Mountain Arsenal. Microfilm RMA052, Frames 0004-0022, 0014.

RMA. 1981a, September 30. History of Rocky Mountain Arsenal, October 1, 1980 through September 30, 1981. Microfilm RMA196, Frame 1002.

RMA. 1981b, December 24. Telex from commander, RMA to commander, SA-LAC, Kelly AFB, re: hydrazine waste. Microfilm RAF001, Frame 1859.

RMA. 1982, September 30. Rocky Mountain Arsenal annual historical review, October 1, 1981 through September 30, 1982. Microfilm RMA196, Frames 1153-1154.

RMA. 1983, September 30. Rocky Mountain Arsenal annual historical review, October 1, 1982 through September 30, 1983. Microfilm RMA196, Frames 1216-1217.

RIC 83326R01
RMACCPMT (Rocky Mountain Arsenal Contamination Cleanup Program Management Team). 1983. Selection of a contamination control strategy for Rocky Mountain Arsenal, 2 volumes. USATHAMA & RMA.

RIC 84034R01
RMACCPMT. 1984. Decontamination assessment of land and facilities at Rocky Mountain Arsenal, draft final report and executive summary. RMA, USATHAMA, and D'Appollonia. Microfilm RAA031, Frame 055-0672.

RMA. Undated. Plot plan, UDMH-hydrazine mixing facility contaminated waste pump disc. line to 742A. Drawing No. E5-72-2A, Group No. 31-23.

Rodgers, R.L. 1976, November 16. Memorandum for record; minutes of meeting on hydrazine plant, November 15, 1976, Rocky Mountain Arsenal. Microfilm RMA245, Frames 1031-1032.

RIC 81293M01

Romero, J.C., and G. Ward. 1981. Water table contour map of the Rocky Mountain Arsenal region, southwest Adams County, Colorado. Colorado Division of Water Resources.

Rudy, M.M. 1974, April 1. Memorandum with attachment to "A(CMAL74-0)" division, re: standard prices for missile fuels management category items, p. 4. Microfilm RMA229, Frames 0963-0968, 0966.

Ryan, A.J. and Associates, Inc. 1960a, March 15. Comparative methods of treatment of waste effluent at Rocky Mountain Arsenal. Microfilm RMA005, Frames 1890-1974, 1906.

Ryan, A.J. and Associates, Inc. 1960b, August 29. Report prepared for U.S. Army Corps of Engineers, Omaha, final design analysis design of treatment plant with injection equipment for deep waste disposal well at RMA. Microfilm RMA310, Frames 0002-0030, 0027.

Saindon, B.W. 1977, January 28. Safety survey of UDMH/hydrazine blending and storage facility, RMA safety survey team. Microfilm RMA023, Frames 0227-0234.

Smith, R.W. 1983a, February 9. Letter with attachments to director of energy management, San Antonio air logistics center, attention: SFSP (A. Haswell), re: hydrazine facility at RMA. Microfilm RIA018, Frames 1499-1500, 1503-1505, 1509-1510.

Smith, R.W. 1983b, July 22. Fact sheet to commanding general, AMCCOM, hydrazine blending and storage program status, Rocky Mountain Arsenal. RMA023, Frame 0516.

RIC 83228R01

Spaine, P.W., and R. Gregg. 1983, July. Surface-water quality study of the South Plants area, data report. USAEWES and RMA. Microfilm RAA045, Frame 0304-0343.

RIC 81293R05

Stollar, R.L., and F. van der Leeden. 1981, January. Evaluation of the hydrogeologic system & contamination migration patterns, Rocky Mountain Arsenal, Final Report. Geraghty & Miller, Inc.

RIC 83368R01

Stout, K., and L. Abbott. 1982. Installation assessment, RMA, Volumes I and II. Bionetics Corporation, EPA, and USATHAMA.

Strang, D.W. 1981, October 7. Fact sheet to commanding officer, Rocky Mountain Arsenal, hydrazine plant-waste water disposal, Rocky Mountain Arsenal. Microfilm RMA094, Frame 0390.

Strang, D.W. 1982a, January 18. Memorandum for record, re: funds for hydrazine waste water transfer system, Rocky Mountain Arsenal. Microfilm RMA228, Frame 0330-0331.

Strang, D.W. 1982b, February 22. Disposition form, to director, technical operations, RMA. Hydrazine waste water, Rocky Mountain Arsenal. Microfilm RMA124, Frame 1430.

Strang, D.W. 1982c, June 24. Disposition for with attached hazardous abatement plan to distribution, RMA, hydrazine blending and storage facility, p. 1. Rocky Mountain Arsenal. Microfilm RMA082, Frames 0112-0145, 0113.

Strang, D.W. 1982d. Chronology and status of hydrazine blending operations at RMA. Industrial Division, RMA. Microfilm RMA034, Frames 0467-470.

Strang, D.W. 1985, September 17. Juris deposition, v. 1. pp. 25-27, 50-52. Juris Computer Database.

Strode, H.L. 1970, April 7. Letter to Continental Oil Company, Colorado. Order for JP-4 aviation fuel, Department of the Air Force, St. Louis, Missouri. Microfilm RMA252, Frame 1272.

RIC 86009R01

Trautmann, W.L. 1984. Rocky Mountain Arsenal preliminary monitoring plan for the hydrazine blending facility, preliminary report.

Unauthored, Undated-a. Report. Chronology and status of hydrazine blending operations at Rocky Mountain Arsenal. Microfilm RMA034, Frames 0467-0470, 0467.

Unauthored, undated-b. Air Force mixing plant sketch. Microfilm RAF003, Frame 1346.

Ursillo, J.A. 1974, May 31. Letter with attachment to commander, Kelly AFB, re: inventory and reporting of empty stainless steel and aluminum drums. Microfilm RMA023, Frames 0276-0278, 0278.

USAF (U.S. Air Force). 1982a, January 19. Telex from SA-ALC, Kelly AFB to commander, RMA, re: hydrazine waste. Microfilm RMA124, Frame 1433.

USAF. 1982b, January. Telex from SA-ALC, Kelly AFB to commander, RMA, re: hydrazine facility. Microfilm RAF001, Frame 1856.

USAMDARC (U.S. Army Material Development and Readiness Command). 1979. Safety regulations for chemical agent H. DARCOM-R 385-31. Department of the Army.

USAMDARC. 1982. Safety regulations for chemical agents GM and VX. DARCOM-R 385-102. Department of the Army.

RIC 82091R02

van der Leeden, F. 1981. Geohydrology control study, summary document. Geraghty & Miller, Inc.

Vershuren, K. 1977. Handbook of environmental data on organic chemicals. New York: Van Norstrand Reinold Company.

Wash, T.J., F.L. Heyde, and J.M. Cecil. 1983. Draft: Minutes of meeting on decontamination of hydrazine facility, 25 January 1983. ARRCOM and USAF. Microfilm RIA024, Frames 2188-2195.

Watson, G.G. 1975, June 10. Letter to commander, U.S. Army armament command, re: request for safety review and approval for hydrazine facility UDMH storage capacity. Microfilm RMA056, Frames 1140-1142.

Way, D.L. 1985, July 24. Juris deposition, v. 7, pp. 1153-1154. Juris Computer Database.

Williams, A. 1978, February 1. Memorandum with attachments to project manager for chemical demilitarization, Aberdeen Proving ground, re: characterization of wastes emanating from South Plants Area, Rocky Mountain Arsenal. Microfilm RMA019, Frames 1804-1814, at 1804-1806.

Zeorian, E.C. 1972, July 19. Disposition form to F. McKinney, RMA, charges to JPX job order 1218, third quarter 1972, Rocky Mountain Arsenal. Microfilm RMA023, Frame 0377.

Appendix 1-7-A

Chemical Names and Abbreviations

APPENDIX 1-7-A
Chemical Names and Abbreviations

Analytic Methods

Atomic Absorption Spectroscopy
Gas Chromatography/Conductivity Detector
Gas Chromatography/Electron Capture Detector
Gas Chromatography/Flame Ionization Detector
Gas Chromatography/Flame Photometric Detector
Gas Chromatography/Mass Spectrometry
Gas Chromatography/Nitrogen Phosphorous Detector
Gas Chromatography/Photoionization Detector
High Performance Liquid Chromatography
Inductive Coupled Argon Plasma Screen
Ion Chromatography
Spectrophotometry

Abbreviations

AA
GCCON
GCECD
GCFID
GCFPD
GCMS
GCNPD
GCPID
HPLC
ICP
IONCHROM
SPECT

PHASE I ANALYTES AND CERTIFIED METHODS
SOIL SAMPLES

<u>Analysis/Methods/Analytes</u>	<u>Synonymous Names Used in Appendix B</u>	<u>Abbreviations</u>
<u>AGENT PRODUCTS/HPLC</u>		<u>TDG</u>
Chloroacetic acid	Chloroacetic acid	CLC2A
Thiodiglycol	Thiodiglycol (TDG)	TDGCL
<u>AGENT PRODUCTS/IONCHROM</u>		<u>GBDP</u>
Isopropylmethylphosphonic acid	Isopropylmethylphosphonate	IMPA
<u>ANIONS/IONCHROM</u>		<u>ANIONS</u>
Chloride	Chloride	CL
Fluoride	Fluoride	FL
Sulfate	Sulfate	SO4
<u>ARSENIC/AA</u>	Arsenic	AS
<u>DIBROMOCHLOROPROPANE/GCECD</u>	Dibromochloropropane	DBCP
<u>HYDRAZINES/SPECT</u>		<u>HYD</u>
Hydrazine	Hydrazine	HYDRZ
Methylhydrazine	Methylhydrazine	MHYDRZ
Unsymmetrical dimethyl hydrazine	Unsymmetrical dimethyl hydrazine	UDMH
<u>MERCURY/AA</u>	Mercury	RG

APPENDIX 1-7-A (Continued)
Phase I

<u>Analysis/Methods/Analytes</u>	<u>Synonymous Names Used in Appendix B</u>	<u>Abbreviations</u>
<u>METALS/ICP</u>		<u>ICP</u>
Cadmium	Cadmium	CD
Chromium	Chromium	CR
Copper	Copper	CU
Lead	Lead	PB
Zinc	Zinc	ZN
<u>ORGANONITROGEN COMPOUNDS/GC/NPD</u>		<u>ONC</u>
n-Nitrosodimethylamine	n-Nitrosodimethylamine	NNDMEA
n-Nitrosodi-n-propylamine	n-Nitrosodi-n-propylamine	NNDNPA
<u>ORGANOPHOSPHOROUS COMPOUNDS/GC/FPD</u>		<u>OPC</u>
Diisopropylmethyl phosphonate	Diisopropylmethyl phosphonate	DIMP
Dimethylmethyl phosphonate	Dimethylmethyl phosphate	DMMP
<u>SEMIVOLATILE ORGANIC COMPOUNDS/ GC/MS</u>		<u>SVQ</u>
1,4-Oxathiane	1,4-Oxathiane	OXAT
2,2-bis(Para-chlorophenyl)- 1,1-dichloroethane	Dichlorodiphenylethane	PPDDE
2,2-bis(Para-chlorophenyl)- 1,1,1-trichloroethane	Dichlorodiphenyltrichloro- ethane	PPDDT
Aldrin	Aldrin	ALDRN
Atrazine	Atrazine	ATZ
Chlordane	Chlordane	CLDAN
Chlorophenylmethyl sulfide	p-Chlorophenylmethyl sulfide	CPMS
Chlorophenylmethyl sulfone	p-Chlorophenylmethyl sulfone	CPMSO2
Chlorophenylmethyl sulfoxide	p-Chlorophenylmethyl sulfoxide	CPMSO
Dibromochloropropane	Dibromochloropropane	DBCP
Dicyclopentadiene	Dicyclopentadiene	DCPD
Dieldrin	Dieldrin	DLDRN
Diisopropylmethyl phosphonate	Diisopropylmethyl phosphonate	DIMP
Dimethylmethyl phosphonate	Dimethylmethyl phosphonate	DMMP*
Dithiane	Dithiane	DITH
Endrin	Endrin	ENDRN
Hexachlorocyclopentadiene	Hexachlorocyclopentadiene	CL6CP
Isodrin	Isodrin	ISODR
Malathion	Malathion	MLTHN
Parathion	Parathion	PRTHN
Supona	2-Chloro-1 (2,4-dichlorophenyl) vinyl diethyl phosphates	SUPONA
Vapona	Vapona	DDVP

* DMMP is certified as part of the semivolatile organic compound method only for Hittman-Ebasco Laboratory.

APPENDIX 1-7-A (Continued)
Phase I

<u>Analysis/Methods/Analytes</u>	<u>Synonymous Names Used in Appendix B</u>	<u>Abbreviations</u>
<u>VOLATILE ORGANIC COMPOUNDS/ GCMS</u>		<u>VQ</u>
1,1-Dichloroethane	1,1-Dichloroethane	11DCLE
1,2-Dichloroethane	1,2-Dichloroethane	12DCLE
1,1,1-Trichloroethane	1,1,1-Trichloroethane	111TCE
1,1,2-Trichloroethane	1,1,2-Trichloroethane	112TCE
Benzene	Benzene	C6H6
Bicycloheptadiene	Bicycloheptadiene	BCHPD
Carbon tetrachloride	Carbon tetrachloride	CCl4
Chlorobenzene	Chlorobenzene	CLC6H5
Chloroform	Chloroform	CHCL3
Dibromochloropropane	Dibromochloropropane	DBCP
Dicyclopentadiene	Dicyclopentadiene	DCPD
Dimethyldisulfide	Dimethyldisulfide	DMDS
Ethylbenzene	Ethylbenzene	ETC6H5
m-Xylene	m-Xylene	13DMB
Methylene chloride	Methylene chloride	CH2CL2
Methylisobutyl ketone	Methylisobutyl ketone	MIBK
o- and p-Xylene	Ortho- & Para-xylene	XYLEN
Tetrachloroethylene	Tetrachloroethene	TCLEE
Toluene	Toluene	MEC6H5
Trans-1,2-dichloroethylene	Trans-1,2-dichloroethene	12DCE
Trichloroethylene	Trichloroethene	TRCLE

**APPENDIX 1-7-A
Phase II**

**PHASE II ANALYTES AND CERTIFIED METHODS
SOIL SAMPLES**

<u>Analysis/Methods/Analytes</u>	<u>Synonymous Names Used in Appendix B</u>	<u>Abbreviations</u>
<u>AGENT PRODUCTS/HPLC</u> (Same as Phase I)		<u>TDG</u>
<u>AGENT PRODUCTS/IONCHROM</u> (Same as Phase I)		<u>GBDP</u>
<u>ANIONS/IONCHROM</u> (Same as Phase I)		<u>ANIONS</u>
<u>ARSENIC/AA</u>	Arsenic	<u>AS</u>
<u>DIBROMOCHLOROPROPANE/GC</u>	Dibromochloropropane	<u>DBCP</u>
<u>HYDRAZINES/SPECT</u> (Same as Phase I)		<u>HYD</u>
<u>MERCURY/AA</u>	Mercury	<u>HG</u>
<u>METALS/ICP</u> (Same as Phase I)		<u>ICP</u>
<u>ORGANOCHLORINE PESTICIDES/GCECD</u>		<u>OCP</u>
2,2-bis(Para-chlorophenyl)- 1,1-dichloroethane	Dichlorodiphenylethane	<u>PPDDE</u>
2,2-bis(Para-chlorophenyl)- 1,1,1-trichloroethane	Dichlorodiphenyltrichloro- ethane	<u>PPDDT</u>
Aldrin	Aldrin	<u>ALDRN</u>
Chlordane	Chlordane	<u>CLDAN</u>
Dieldrin	Dieldrin	<u>DLDRN</u>
Endrin	Endrin	<u>ENDRN</u>
Hexachlorocyclopentadiene	Hexachlorocyclopentadiene	<u>CL6CP</u>
Isodrin	Isodrin	<u>ISODR</u>
<u>ORGANONITROGEN COMPOUNDS/GCNPD</u> (Same as Phase I)		<u>ONC</u>
<u>ORGANOPHOSPHOROUS COMPOUNDS/GCFPD</u> (Same as Phase I)		<u>OPC</u>

APPENDIX 1-7-A (Continued)
Phase II

<u>Analysis/Methods/Analytes</u>	<u>Synonymous Names Used in Appendix B</u>	<u>Abbreviations</u>
ORGANOPHOSPHORUS PESTICIDES/ GCNPD		
Atrazine	Atrazine	OPP
Malathion	Malathion	ATZ
Parathion	Parathion	MLTHN
Supona	2-Chloro-1 (2,4-dichlorophenyl) vinyl diethyl phosphates	PRTHN
	Vapona	SUPONA
Vapona		DDVP
ORGANOSULPHUR COMPOUNDS/GCFPD		
1,4-Oxathiane	1,4-Oxathiane	OSC
Chlorophenylmethyl sulfide	p-Chlorophenylmethyl sulfide	OXAT
Chlorophenylmethyl sulfone	p-Chlorophenylmethyl sulfone	CPMS
Chlorophenylmethyl sulfoxide	p-Chlorophenylmethyl sulfoxide	CPMSO2
Dimethyldisulfide	Dimethyldisulfide	CPMSO
Dithiane	Dithiane	DMDS
		DITH
SEMIVOLATILE ORGANIC COMPOUNDS/ GCMS		
(Same as Phase I)		SVQ
VOLATILE AROMATIC ORGANIC COMPOUNDS/GCPID		
Benzene	Benzene	VAO
Ethylbenzene	Ethylbenzene	C6H6
m-Xylene	m-Xylene	ETC6H5
o- and p-Xylene	Ortho- & Para-xylene	13DMB
Toluene	Toluene	XYLEN
		MEC6H5
VOLATILE HALOGENATED ORGANIC COMPOUNDS/GCCON		
1,1-Dichloroethane	1,1-Dichloroethane	VHQ
1,2-Dichloroethane	1,2-Dichloroethane	11DCLE
1,1-Dichloroethene	1,1-Dichloroethene	12DCLE
1,1,1-Trichloroethane	1,1,1-Trichloroethane	11DCE
1,1,2-Trichloroethane	1,1,2-Trichloroethane	111TCE
Carbon tetrachloride	Carbon tetrachloride	112TCE
Chlorobenzene	Chlorobenzene	CCL4
Chloroform	Chloroform	CLC6H5
Methylene chloride	Methylene chloride	CHCL3
Tetrachloroethylene	Tetrachloroethene	CH2CL2
Trans-1,2-dichloroethylene	Trans-1,2-dichloroethene	TCLEE
Trichloroethylene	Trichloroethene	T12DCE
		TRCLE

APPENDIX 1-7-A (Continued)
Phase II

<u>Analysis/Methods/Analytes</u>	<u>Synonymous Names Used in Appendix B</u>	<u>Abbreviations</u>
<u>VOLATILE HYDROCARBON COMPOUNDS/ GCFID</u>		
Bicycloheptadiene	Bicycloheptadiene	<u>HYDCBN</u>
Dicyclopentadiene	Dicyclopentadiene	BCHPD
Methylisobutyl ketone	Methylisobutyl ketone	DCPD
		MIBK
<u>VOLATILE ORGANIC COMPOUNDS/GCMS</u> (Same as Phase I)		<u>VO</u>

Appendix 1-7-B

Phase I Chemical Data

APPENDIX 1-7-B
Chemical Data

The analytical results of the laboratory analysis of soil samples collected as part of the program comprise the first part of Appendix 1-7-B. Data are listed sequentially by boring number and successive depths below the surface. Within each depth, all analytes for which the samples were tested are listed alphabetically. Results are given as less than (LT) the detection limit for the test laboratory, or as detected concentrations above this limit. Based on the accuracy of laboratory test methods, values for volatile and semivolatile compounds are considered accurate to one significant figure, values for dibromochloropropane when tested separately and for metals are considered accurate to two significant figures.

The second part of Appendix 1-7-B contains data from the blanks associated with the analytical work. Blanks for the soil samples were based on a homogenized subsample of composited samples from a known uncontaminated soil that is stratigraphically similar to the RMA soils. Blanks for the water samples were based on distilled water. Control samples, or blanks, are introduced into the train of environmental samples to function as monitors on the performance of the analytical method. These samples function as quality control (QC) samples, and are an integral part of the quality assurance (QA) program for the project. The method blanks listed in this Appendix were utilized to verify that the laboratory was not a source of sample contamination. If contamination were detected in a method blank, corrective actions were taken to assure that reported concentrations of target analytes reflected sample analytes, and not analytes introduced by the laboratory process.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program

11/11/86

Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0001	0-1	Soil	Aldrin	LT 3. -01	ug/g	BCS010
			Arsenic	LT 2.5 +00	ug/g	BDC005
			Atrazine	LT 3. -01	ug/g	BCS010
			Cadmium	LT 1.7 +00	ug/g	BCX013
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCS010
			Chlordane	LT 2. +00	ug/g	BCS010
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCS010
			p-Chlorophenylmethyl Sulfonide	LT 3. -01	ug/g	BCS010
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCS010
			Chromium	LT 2.7 +01	ug/g	BCX013
			Copper	1.5 +01	ug/g	BCX013
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR013
			Dibromochloropropane	LT 3. -01	ug/g	BCS010
			Dicyclopentadiene	LT 1. +00	ug/g	BCS010
			Vapona	LT 3. +00	ug/g	BCS010
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCS010
			Dithiane	LT 4. -01	ug/g	BCS010
			Diieldrin	4. -01	ug/g	BCS010
			Endrin	LT 5. -01	ug/g	BCS010
			Mercury	8.6 -02	ug/g	BCV013
			Hydrazine	LT 5. +01	ug/g	BC0013
			Isodrin	LT 3. -01	ug/g	BCS010
			Methylhydrazine	LT 2. +02	ug/g	BCP007
			Melathion	LT 7. -01	ug/g	BCS010
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN013
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN013
			1,4-Oxathiane	LT 3. -01	ug/g	BCS010
			Lead	1.3 +02	ug/g	BCX013
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCS010
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCS010
			Parathion	LT 9. -01	ug/g	BCS010
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCS010

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0001	0-1	Soil	Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BC0013
			Zinc	1.5 +02	ug/g	BCX013
0001	4-5	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BCT008
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BCT008
			1,1-Dichloroethane	LT 2. +00	ug/g	BCT008
			1,2-Dichloroethane	LT 2. +00	ug/g	BCT008
			1,2-Dichloroethane	LT 6. -01	ug/g	BCT008
			m-Xylene	LT 8. -01	ug/g	BCT008
			Aldrin	LT 3. -01	ug/g	BCV002
			Arsenic	LT 2.5 +00	ug/g	BC0006
			Atrazine	LT 3. -01	ug/g	BCV002
			Bicycloheptadiene	LT 4. -01	ug/g	BCT008
			Benzene	LT 3. -01	ug/g	BCT008
			Carbon Tetrachloride	LT 3. -01	ug/g	BCT008
			Cadmium	LT 7.4 -01	ug/g	BCX014
			Methylene Chloride	LT 2. +00	ug/g	BCT008
			Chloroform	LT 3. -01	ug/g	BCT008
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCV002
			Chlorobenzene	LT 1. +00	ug/g	BCT008
			Chlordane	LT 2. +00	ug/g	BCV002
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCV002
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCV002
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCV002
			Chromium	1.6 +01	ug/g	BCX014
			Copper	1.0 +01	ug/g	BCX014
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR014
			Dibromochloropropane	LT 2. +00	ug/g	BCT008
			Dibromochloropropane	LT 3. -01	ug/g	BCV002
			Dicyclopentadiene	LT 7. -01	ug/g	BCT008
			Dicyclopentadiene	LT 1. +00	ug/g	BCV002
			Vapona	LT 3. +00	ug/g	BCV002
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCV002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11. Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0001	4-5	Soil	Dithiane	LT 4. -01	ug/g	BCV0002
			Dieldrin	LT 3. -01	ug/g	BCV0002
			Dimethyldisulfide	LT 2. +01	ug/g	BCV0008
			Endrin	LT 5. -01	ug/g	BCV0002
			Ethylbenzene	LT 4. -01	ug/g	BCV0008
			Mercury	LT 5.0 -02	ug/g	BCV014
			Hydrazine	LT 5. +01	ug/g	BCV014
			Isodrin	LT 3. -01	ug/g	BCV0002
			Toluene	LT 3. -01	ug/g	BCV0008
			Methylhydrazine	LT 2. +02	ug/g	BCV0008
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCV0008
			Malathion	LT 7. -01	ug/g	BCV0002
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCV014
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCV014
			1,4-Oxathiane	LT 5. -01	ug/g	BCV0002
			Lead	LT 8.4 +00	ug/g	BCV014
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCV0002
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCV0002
			Parathion	LT 9. -01	ug/g	BCV0002
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BCV0002
0001	9-10	Soil	Tetrachloroethene	LT 3. -01	ug/g	BCV0008
			Trichloroethene	LT 5. -01	ug/g	BCV0008
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BCV014
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BCV0008
			Zinc	4.3 +01	ug/g	BCV014
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BCV0002
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BCV0002
			1,1-Dichloroethane	LT 2. +00	ug/g	BCV0002
			1,2-Dichloroethane	LT 2. +00	ug/g	BCV0002
			1,2-Dichloroethane	LT 6. -01	ug/g	BCV0002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0001	9-10	Soil	m-Xylene	LT 8. -01	ug/g	BCU002
			Aldrin	LT 3. -01	ug/g	BCV003
			Arsenic	LT 2.5 +00	ug/g	BC0007
			Atrazine	LT 3. -01	ug/g	BCV003
			Bicycloheptadiene	LT 4. -01	ug/g	BCU002
			Benzene	LT 3. -01	ug/g	BCU002
			Carbon Tetrachloride	LT 3. -01	ug/g	BCU002
			Cadmium	LT 7.4 -01	ug/g	BCX015
			Methylene Chloride	LT 2. +00	ug/g	BCU002
			Chloroform	LT 3. -01	ug/g	BCU002
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCV003
			Chlorobenzene	LT 1. +00	ug/g	BCU002
			Chlordane	LT 2. +00	ug/g	BCV003
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCV003
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCV003
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCV003
			Chromium	1.3 +01	ug/g	BCX015
			Copper	8.1 +01	ug/g	BCX015
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR015
			Dibromochloropropane	LT 2. +00	ug/g	BCU002
			Dibromochloropropane	LT 3. -01	ug/g	BCV003
			Dicyclopentadiene	LT 7. -01	ug/g	BCU002
			Dicyclopentadiene	LT 1. +00	ug/g	BCV003
			Vapona	LT 3. +00	ug/g	BCV003
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCV003
			Dithiane	LT 4. -01	ug/g	BCV003
			Dieldrin	LT 3. -01	ug/g	BCV003
			Dimethyldisulfide	LT 2. +01	ug/g	BCU002
			Endrin	LT 5. -01	ug/g	BCV003
			Ethylbenzene	LT 4. -01	ug/g	BCU002
			Mercury	LT 5.0 -02	ug/g	BCY015
			Hydrazine	LT 5. +01	ug/g	BC0015
			Isodrin	LT 3. -01	ug/g	BCV003
			Toluene	LT 3. -01	ug/g	BCU002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Ebasco Services Incorporated

Rocky Mountain Arsenal Program

11/11/86

Summary of Analytical Results

Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0001	9-10	Soil	Methylhydrazine	LT 2. -02	ug/g	BCP009
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCU002
			Malathion	LT 7. -01	ug/g	BCV003
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN015
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN015
			1,4-Oxathiane	LT 3. -01	ug/g	BCV003
			Lead	LT 8.4 +00	ug/g	BCX015
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCV003
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCV003
			Parathion	LT 9. -01	ug/g	BCV003
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BCV003
			Tetrachloroethene	LT 3. -01	ug/g	BCU002
			Trichloroethene	LT 5. -01	ug/g	BCU002
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BCO015
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BCU002
			Zinc	LT 9.2 +01	ug/g	BCX015
0002	0-1	Soil	Aldrin	LT 3. -01	ug/g	BBM005
			Arsenic	LT 2.5 +00	ug/g	BBN010
			Atrazine	LT 3. -01	ug/g	BBM005
			Cadmium	LT 7.4 -01	ug/g	BBP010
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BBM005
			Chlordane	LT 2. +00	ug/g	BBM005
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BBM005
			p-Chlorophenylmethyl Sulfonide	LT 3. -01	ug/g	BBM005
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BBM005
			Chromium	LT 1.0 +01	ug/g	BBP010
			Copper	LT 8.6 +00	ug/g	BBP010
			Dibromochloropropane	LT 5.0 -03	ug/g	BBK008
			Dibromochloropropane	LT 3. -01	ug/g	BBM005
			Dicyclopentadiene	LT 1. +00	ug/g	BBM005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	0-1	Soil	Vapors	LT 3. +00	ug/g	88M005
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	88M005
			Dithiane	LT 4. -01	ug/g	88M005
			Dieldrin	LT 3. -01	ug/g	88M005
			Endrin	LT 5. -01	ug/g	88M005
			Mercury	LT 5.0 -02	ug/g	880010
			Hydrazine	LT 5. +01	ug/g	88Z005
			Isodrin	LT 3. -01	ug/g	88M005
			Methylhydrazine	LT 2. +02	ug/g	88Y005
			Malathion	LT 7. -01	ug/g	88M005
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	88A005
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	88A005
			1,4-Oxathiane	LT 3. -01	ug/g	88M005
			Lead	LT 6. +01	ug/g	88P010
			Dichlorodiphenylethane	LT 5. -01	ug/g	88M005
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	88M005
0002	4-5	Soil	Parathion	LT 9. -01	ug/g	88M005
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	88M005
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	88X005
			Zinc	3.4 +01	ug/g	88P010
			1,1,1-Trichloroethane	LT 4. -01	ug/g	88L004
			1,1,2-Trichloroethane	LT 4. -01	ug/g	88L004
			1,1-Dichloroethane	LT 2. +00	ug/g	88L004
			1,2-Dichloroethane	LT 2. +00	ug/g	88L004
			1,2-Dichloroethane	LT 6. -01	ug/g	88L004
			m-Xylene	LT 8. -01	ug/g	88L004
			Aldrin	LT 3. -01	ug/g	88M006
			Arsenic	LT 2.5 +00	ug/g	88N011
			Atrazine	LT 3. -01	ug/g	88M006
			Bicycloheptadiene	LT 4. -01	ug/g	88L004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	4-5	Soil	Benzene	LT 3. -01	ug/g	BBL004
			Carbon Tetrachloride	LT 3. -01	ug/g	BBL004
			Cadmium	LT 7.4 -01	ug/g	BBP011
			Methylene Chloride	LT 2. +00	ug/g	BBL004
			Chloroform	LT 3. -01	ug/g	BBL004
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BBM006
			Chlorobenzene	LT 1. +00	ug/g	BBL004
			Chlordane	LT 2. +00	ug/g	BBM006
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BBM006
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BBM006
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BBM006
			Chromium	1.1 +01	ug/g	BBP011
			Copper	8.2 +00	ug/g	BBP011
			Dibromochloropropane	LT 5.0 -03	ug/g	BBK009
			Dibromochloropropane	LT 2. +00	ug/g	BBL004
			Dibromochloropropane	LT 3. -01	ug/g	BBM006
			Dicyclopentadiene	LT 7. -01	ug/g	BBL004
			Dicyclopentadiene	LT 1. +00	ug/g	BBM006
			Vapona	LT 3. +00	ug/g	BBM006
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BBM006
			Dithiane	LT 4. -01	ug/g	BBM006
			Dieldrin	LT 3. -01	ug/g	BBM006
			Dimethyldisulfide	LT 2. +01	ug/g	BBL004
			Endrin	LT 5. -01	ug/g	BBM006
			Ethylbenzene	LT 4. -01	ug/g	BBL004
			Mercury	LT 5.0 -02	ug/g	BB0011
			Hydrazine	LT 5. +01	ug/g	BBZ006
			Isodrin	LT 3. -01	ug/g	BBM006
			Toluene	LT 3. -01	ug/g	BBL004
			Methylhydrazine	LT 2. +02	ug/g	BBY006
			Methylisobutyl Ketone	LT 7. -01	ug/g	BBL004
			Malathion	LT 7. -01	ug/g	BBM006
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCA006
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCA006

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	4-5	Soil	1,4-Oxathiane	LT 3. -01	ug/g	BBM006
			Lead	LT 8.4 +01	ug/g	BBP011
			Dichlorodiphenylethane	LT 6. -01	ug/g	BBM006
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BBM006
			Parathion	LT 9. -01	ug/g	BBM006
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BBM006
			Tetrachloroethene	LT 3. -01	ug/g	BBL004
			Trichloroethene	LT 5. -01	ug/g	BBL004
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BBX006
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BBL004
			Zinc	3.4 +01	ug/g	BBP011
0002	5.1-6.1	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BBL005
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BBL005
			1,1-Dichloroethane	LT 2. +00	ug/g	BBL005
			1,2-Dichloroethane	LT 2. +00	ug/g	BBL005
			1,2-Dichloroethane	LT 6. -01	ug/g	BBL005
			m-Xylene	LT 8. -01	ug/g	BBL005
			Aldrin	LT 3. -01	ug/g	BBM 07
			Arsenic	LT 2.5 +00	ug/g	BBM012
			Atrazine	LT 3. -01	ug/g	BBM007
			Bicycloheptadiene	LT 4. -01	ug/g	BBL005
			Benzene	LT 3. -01	ug/g	BBL005
			Carbon Tetrachloride	LT 3. -01	ug/g	BBL005
			Cadmium	LT 7.4 -01	ug/g	BBP012
			Methylene Chloride	LT 2. +00	ug/g	BBL005
			Chloroform	LT 3. -01	ug/g	BBL005
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BBM007
			Chlorobenzene	LT 1. +00	ug/g	BBL005
			Chlordane	LT 2. +00	ug/g	BBM007
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BBM007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	5.1-6.1	Soil	p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BSM007
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BSM007
			Chromium	1.3 +01	ug/g	BSF012
			Copper	1.3 +01	ug/g	BSF012
			Dibromochloropropane	LT 5.0 -03	ug/g	BSK010
			Dibromochloropropane	LT 2. +00	ug/g	BSL005
			Dibromochloropropane	LT 3. -01	ug/g	BSM007
			Dicyclopentadiene	LT 7. -01	ug/g	BSL005
			Dicyclopentadiene	LT 1. +00	ug/g	BSM007
			Vapona	LT 3. +00	ug/g	BSM007
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BSM007
			Dithiane	LT 4. -01	ug/g	BSM007
			Dieldrin	LT 3. -01	ug/g	BSM007
			Dimethyldisulfide	LT 2. +01	ug/g	BSL005
			Endrin	LT 5. -01	ug/g	BSM007
			Ethylbenzene	LT 4. -01	ug/g	BSL005
			Mercury	LT 5.0 -02	ug/g	BS0012
			Hydrazine	LT 5. +01	ug/g	BS2007
			Isodrin	LT 3. -01	ug/g	BSM007
			Toluene	LT 3. -01	ug/g	BSL005
			Methylhydrazine	LT 2. +02	ug/g	BSY007
			Methylisobutyl Ketone	LT 7. -01	ug/g	BSL005
			Malathion	LT 7. -01	ug/g	BSM007
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BSA007
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BSA007
			1,4-Oxathiane	LT 3. -01	ug/g	BSM007
			Lead	LT 8.4 +00	ug/g	BSF012
			Dichlorodiphenylethane	LT 6. -01	ug/g	BSM007
			Dichlorodiphenyltrichloro-ethane	LT 5. -01	ug/g	BSM007
			Parathion	LT 9. -01	ug/g	BSM007
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BSM007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	5.1-6.1	Soil	Tetrachloroethene	LT 3. -01	ug/g	BBL005
			Trichloroethene	LT 5. -01	ug/g	BBL005
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BBX007
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BBL005
			Zinc	4.5 +01	ug/g	BBF012
0002	9.5-10	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BBL006
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BBL006
			1,1-Dichloroethane	LT 2. +00	ug/g	BBL006
			1,2-Dichloroethane	LT 2. +00	ug/g	BBL006
			1,2-Dichloroethane	LT 6. -01	ug/g	BBL006
			m-Xylene	LT 8. -01	ug/g	BBL006
			Aldrin	LT 3. -01	ug/g	BBM008
			Arsenic	3.4 +00	ug/g	BBM013
			Atrazine	LT 3. -01	ug/g	BBM008
			Bicycloheptadiene	LT 4. -01	ug/g	BBL006
			Benzene	LT 3. -01	ug/g	BBL006
			Carbon Tetrachloride	LT 3. -01	ug/g	BBL006
			Cadmium	LT 7.4 -01	ug/g	BBF013
			Methylene Chloride	LT 2. +00	ug/g	BBL006
			Chloroform	LT 3. -01	ug/g	BBL006
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BBM008
			Chlorobenzene	LT 1. +00	ug/g	BBL006
			Chloroethane	LT 2. +00	ug/g	BBM008
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BBM008
			p-Chlorophenylmethyl Sulfonide	LT 3. -01	ug/g	BBM008
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BBM008
			Chromium	1.3 +01	ug/g	BBF013
			Copper	3.3 +01	ug/g	BBF013
			Dibromochloropropane	LT 5.0 -03	ug/g	BBK011
			Dibromochloropropane	LT 2. +00	ug/g	BBL006
			Dibromochloropropane	LT 3. -01	ug/g	BBM008
			Dicyclopentadiene	LT 7. -01	ug/g	BBL006

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	9.5-10	Soil	Dicyclopentadiene	LT 1. +00	ug/g	88M008
			Vapona	LT 3. +00	ug/g	88M008
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	88M008
			Dithiane	LT 4. -01	ug/g	88M008
			Dieldrin	LT 3. -01	ug/g	88M008
			Dimethyldisulfide	LT 2. +01	ug/g	88L006
			Endrin	LT 5. -01	ug/g	88M008
			Ethylbenzene	LT 4. -01	ug/g	88L006
			Mercury	LT 5.0 -02	ug/g	880013
			Hydrazine	LT 5. +01	ug/g	88Z008
			Isodrin	LT 3. -01	ug/g	88M008
			Toluene	LT 3. -01	ug/g	88L006
			Methylhydrazine	LT 2. +02	ug/g	88Y008
			Methylisobutyl Ketone	LT 7. -01	ug/g	88L006
			Malathion	LT 7. -01	ug/g	88M008
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	88A008
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	88A008
			1,4-Oxathiane	LT 3. -01	ug/g	88M008
			Lead	1.6 +01	ug/g	88P013
			Dichlorodiphenylethane	LT 6. -01	ug/g	88M008
			Dichlorodiphenyltrichloro-ethane	LT 5. -01	ug/g	88M008
			Parathion	LT 9. -01	ug/g	88M008
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	88M008
			Tetrachloroethene	LT 3. -01	ug/g	88L006
			Trichloroethene	LT 5. -01	ug/g	88L006
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	88X008
			Ortho- & Para-Xylene	LT 5. +00	ug/g	88L006
			Zinc	8.9 +01	ug/g	88P013
0002	14-15	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	88L007
			1,1,2-Trichloroethane	LT 4. -01	ug/g	88L007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	14-15	Soil	1,1-Dichloroethane	LT 2. +00	ug/g	88L007
			1,2-Dichloroethane	LT 2. +00	ug/g	88L007
			1,2-Dichloroethane	LT 6. -01	ug/g	88L007
			m-Xylene	LT 8. -01	ug/g	88L007
			Aldrin	LT 3. -01	ug/g	88M009
			Arsenic	LT 2.5 +00	ug/g	88M008
			Atrazine	LT 3. -01	ug/g	88M009
			Bicycloheptadiene	LT 4. -01	ug/g	88L007
			Benzene	LT 3. -01	ug/g	88L007
			Carbon Tetrachloride	LT 3. -01	ug/g	88L007
			Cadmium	LT 7.4 -01	ug/g	88P008
			Methylene Chloride	LT 2. +00	ug/g	88L007
			Chloroform	LT 3. -01	ug/g	88L007
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	88M009
			Chlorobenzene	LT 1. +00	ug/g	88L007
			Chlordane	LT 2. +00	ug/g	88M009
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	88M009
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	88M009
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	88M009
			Chromium	1.0 +01	ug/g	88P008
			Copper	4.3 +01	ug/g	88P008
			Dibromochloropropane	LT 5.0 -03	ug/g	88K012
			Dibromochloropropane	LT 2. +00	ug/g	88L007
			Dibromochloropropane	LT 3. -01	ug/g	88M009
			Dicyclopentadiene	LT 7. -01	ug/g	88L007
			Dicyclopentadiene	LT 1. +00	ug/g	88M009
			Vapona	LT 3. +00	ug/g	88M009
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	88M009
			Dithiane	LT 4. -01	ug/g	88M009
			Dieldrin	LT 3. -01	ug/g	88M009
			Dimethyldisulfide	LT 2. +01	ug/g	88L007
			Endrin	LT 5. -01	ug/g	88M009
			Ethylbenzene	LT 4. -01	ug/g	88L007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11. Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	14-15	Soil	Mercury	LT 5.0	-02	880008
			Hydrazine	LT 5.	+01	882009
			Isodrin	LT 3.	-01	88M009
			Toluene	LT 3.	-01	88L007
			Methylhydrazine	LT 2.	+02	88Y009
			Methylisobutyl Ketone	LT 7.	-01	88L007
			Malathion	LT 7.	-01	88M009
			N-Nitrosodimethylamine	LT 2.6	-01	88A009
			N-Nitrosodi-N-Propylamine	LT 1.0	-01	88A009
			1,4-Oxathiane	LT 3.	-01	88M009
			Lead	2.3	+01	88P008
			Dichlorodiphenylethane	LT 6.	-01	88M009
			Dichlorodiphenyltrichloroethane	LT 5.	-01	88M009
			Parathion	LT 9.	-01	88M009
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6.	-01	88M009
			Tetrachloroethene	LT 3.	-01	88L007
			Trichloroethene	LT 5.	-01	88L007
			Unsymmetrical Dimethyl Hydrazine	LT 2.	+02	88X009
			Ortho- & Para-Xylene	LT 5.	+00	88L007
			Zinc	1.1	+02	88P008
0002	16.5-17.5	Soil	1,1,1-Trichloroethane	LT 4.	-01	88L008
			1,1,2-Trichloroethane	LT 4.	-01	88L008
			1,1-Dichloroethane	LT 2.	+00	88L008
			1,2-Dichloroethane	LT 2.	+00	88L008
			1,2-Dichloroethane	LT 6.	-01	88L008
			m-Xylene	LT 8.	-01	88L008
			Aldrin	LT 3.	-01	88M010
			Arsenic	LT 2.5	+00	88M009
			Atrazine	LT 3.	-01	88M010
			Bicycloheptadiene	LT 4.	-01	88L008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	16.5-17.5	Soil	Benzene	LT 3. -01	ug/g	88L008
			Carbon Tetrachloride	LT 3. -01	ug/g	88L008
			Cadmium	LT 7.4 -01	ug/g	88P009
			Methylene Chloride	LT 2. +00	ug/g	88L008
			Chloroform	LT 3. -01	ug/g	88L008
			Hexachlorocyclopentadiene	LT 6. +00	ug/g	88M010
			Chlorobenzene	LT 1. +00	ug/g	88L008
			Chlordane	LT 2. +00	ug/g	88M010
			p-Chlorophenylmethyl Sulfide	LT 9. +00	ug/g	88M010
			p-Chlorophenylmethyl Sulfoxide	LT 3. +00	ug/g	88M010
			p-Chlorophenylmethyl Sulfone	LT 3. +00	ug/g	88M010
			Chromium	LT 6.5 +00	ug/g	88P009
			Copper	4.9 +01	ug/g	88P009
			Dibromochloropropane	LT 5.0 -03	ug/g	88K013
			Dibromochloropropane	LT 2. +00	ug/g	88L008
			Dibromochloropropane	LT 3. -01	ug/g	88M010
			Dicyclopentadiene	LT 7. -01	ug/g	88L008
			Dicyclopentadiene	LT 1. +00	ug/g	88M010
			Vapona	LT 3. +00	ug/g	88M010
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	88M010
			Dithiane	LT 4. -01	ug/g	88M010
			Dieldrin	LT 3. +00	ug/g	88M010
			Dimethyldisulfide	LT 2. +01	ug/g	88L008
			Endrin	LT 5. +00	ug/g	88M010
			Ethylbenzene	LT 4. -01	ug/g	88L008
			Mercury	LT 5.0 -02	ug/g	880009
			Hydrazine	LT 5. +01	ug/g	88Z010
			Isodrin	LT 3. -01	ug/g	88M010
			Toluene	LT 3. -01	ug/g	88L008
			Methylhydrazine	LT 2. +02	ug/g	88Y010
			Methylisobutyl Ketone	LT 7. -01	ug/g	88L008
			Malethion	LT 7. -01	ug/g	88M010
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	88A010
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	88A010

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Ebesco Services Incorporated

Rocky Mountain Arsenal Program

11/11/86

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0002	16.5-17.5	Soil	1,4-Oxathiane	LT 3. -01	ug/g	88M010
			Lead	3.1 +01	ug/g	88P009
			Dichlorodiphenylethane	LT 6. +00	ug/g	88M010
			Dichlorodiphenyltrichloro-ethane	LT 5. +00	ug/g	88M010
			Parathion	LT 9. -01	ug/g	88M010
			2-Chloro-1(2,4-Dichlorophenyl) Vinyllethyl Phosphates	LT 6. -01	ug/g	88M010
			Tetrachloroethene	LT 3. -01	ug/g	88L008
			Trichloroethene	LT 5. -01	ug/g	88L008
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	88X010
			Ortho- & Para-Xylene	LT 5. +00	ug/g	88L008
			Zinc	1.0 +02	ug/g	88P009
0003	0-1	Soil	Aldrin	LT 3. -01	ug/g	8CS002
			Arsenic	LT 2.5 +00	ug/g	88N021
			Atrazine	LT 3. -01	ug/g	8CS002
			Cadmium	LT 7.4 -01	ug/g	8CX005
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	8CS002
			Chlordane	LT 2. +00	ug/g	8CS002
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	8CS002
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	8CS002
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	8CS002
			Chromium	2.0 +01	ug/g	8CX005
			Copper	1.6 +01	ug/g	8CX005
			Dibromochloropropane	LT 5.0 -03	ug/g	8CR005
			Dibromochloropropane	LT 3. -01	ug/g	8CS002
			Dicyclopentadiene	LT 1. +00	ug/g	8CS002
			Vapona	LT 3. +00	ug/g	8CS002
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	8CS002
			Dithiane	LT 4. -01	ug/g	8CS002
			Dieldrin	LT 3. -01	ug/g	8CS002
			Endrin	LT 5. -01	ug/g	8CS002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0003	0-1	Soil	Mercury	LT 5.0 -02	ug/g	BCY005
			Hydrazine	LT 5. +01	ug/g	BCQ005
			Isodrin	LT 3. -01	ug/g	BCS002
			Methylhydrazine	LT 2. +02	ug/g	BCP005
			Melathion	LT 7. -01	ug/g	BCS002
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN005
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN005
			1,4-Oxathiane	LT 3. -01	ug/g	BCS002
			Lead	LT 1.5 +01	ug/g	BCX005
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCS002
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCS002
			Parathion	LT 9. -01	ug/g	BCS002
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCS002
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BCO005
0003	4-5	Soil	Zinc	6.3 +01	ug/g	BCX005
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BCI002
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BCI002
			1,1-Dichloroethane	LT 2. +00	ug/g	BCI002
			1,2-Dichloroethane	LT 2. +00	ug/g	BCI002
			1,2-Dichloroethane	LT 6. -01	ug/g	BCI002
			m-Xylene	LT 8. -01	ug/g	BCI002
			Aldrin	LT 3. -01	ug/g	BCS003
			Arsenic	LT 3.2 +00	ug/g	BSN022
			Atrazine	LT 3. -01	ug/g	BCS003
			Bicycloheptadiene	LT 4. -01	ug/g	BCI002
			Benzene	LT 3. -01	ug/g	BCI002
			Carbon Tetrachloride	LT 3. -01	ug/g	BCI002
			Cadmium	LT 7.4 -01	ug/g	BCX006
			Methylene Chloride	LT 2. +00	ug/g	BCI002
			Chloroform	LT 3. -01	ug/g	BCI002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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 Summary of Analytical Results Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0003	4-5	Soil	Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCS003
			Chlorobenzene	LT 1. +00	ug/g	BCI002
			Chlordane	LT 2. +00	ug/g	BCS003
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCS003
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCS003
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCS003
			Chromium	1.9 +01	ug/g	BCX006
			Copper	1.3 +01	ug/g	BCX006
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR006
			Dibromochloropropane	LT 3. -01	ug/g	BCS003
			Dibromochloropropane	LT 2. +00	ug/g	BCI002
			Dicyclopentadiene	LT 1. +00	ug/g	BCS003
			Dicyclopentadiene	LT 7. -01	ug/g	BCI002
			Vapona	LT 3. +00	ug/g	BCS003
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCS003
			Dithiane	LT 4. -01	ug/g	BCS003
			Dieldrin	LT 3. -01	ug/g	BCS003
			Dimethyldisulfide	LT 2. +01	ug/g	BCI002
			Endrin	LT 5. -01	ug/g	BCS003
			Ethylbenzene	LT 4. -01	ug/g	BCI002
			Mercury	LT 5.0 -02	ug/g	BCY006
			Hydrazine	LT 5. +01	ug/g	BCR006
			Isodrin	LT 3. -01	ug/g	BCS003
			Toluene	LT 3. -01	ug/g	BCI002
			Methylhydrazine	LT 2. +02	ug/g	BCP006
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCI002
			Malathion	LT 7. -01	ug/g	BCS003
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN006
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN006
			1,4-Oxathiane	LT 3. -01	ug/g	BCS003
			Lead	LT 8.4 +00	ug/g	BCX006
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCS003
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCS003

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0003	4-5	Soil	Parathion	LT 9. -01	ug/g	BCS003
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCS003
			Tetrachloroethene	LT 3. -01	ug/g	BCT002
			Trichloroethene	LT 5. -01	ug/g	BCT002
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BC0006
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BCT002
			Zinc	5.6 +01	ug/g	BCX006
0004	0-1	Soil	Aldrin	LT 3. -01	ug/g	BCS004
			Arsenic	LT 2.5 +00	ug/g	BBN023
			Atrazine	LT 3. -01	ug/g	BCS004
			Cadmium	LT 7.4 -01	ug/g	BCX007
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCS004
			Chlordane	LT 2. +00	ug/g	BCS004
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCS004
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCS004
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCS004
			Chromium	LT 6.5 +00	ug/g	BCX007
			Copper	6.5 +00	ug/g	BCX007
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR007
			Dibromochloropropane	LT 3. -01	ug/g	BCS004
			Dicyclopentadiene	LT 1. +00	ug/g	BCS004
			Vapors	LT 3. +00	ug/g	BCS004
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCS004
			Dithiane	LT 4. -01	ug/g	BCS004
			Dieldrin	LT 3. -01	ug/g	BCS004
			Endrin	LT 5. -01	ug/g	BCS004
			Mercury	LT 5.0 -02	ug/g	BCY007
			Hydrazine	LT 5. +01	ug/g	BC0007
			Isodrin	LT 3. -01	ug/g	BCS004
			Methylhydrazine	LT 2. +02	ug/g	BCP010
			Malathion	LT 7. -01	ug/g	BCS004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

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Task 11, Site 1-7 Hydrizine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	0-1	Soil	N-Nitrosodimethylamine	LT 2.6	-01 ug/g	BCN007
			N-Nitrosodi-N-Propylamine	LT 1.0	-01 ug/g	BCN007
			1,4-Oxathiane	LT 3.	-01 ug/g	BCS004
			Lead	LT 8.4	+00 ug/g	BCX007
			Dichlorodiphenylethane	LT 6.	-01 ug/g	BCS004
			Dichlorodiphenyltrichloroethane	LT 5.	-01 ug/g	BCS004
			Parathion	LT 9.	-01 ug/g	BCS004
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6.	-01 ug/g	BCS004
			Unsymmetrical Dimethyl Hydrizine	LT 2.	+02 ug/g	BC0007
			Zinc	2.0	+01 ug/g	BCX007
0004	4-5	Soil	1,1,1-Trichloroethane	LT 4.	-01 ug/g	ECT003
			1,1,2-Trichloroethane	LT 4.	-01 ug/g	ECT003
			1,1-Dichloroethane	LT 2.	+00 ug/g	ECT003
			1,2-Dichloroethane	LT 2.	+00 ug/g	ECT003
			1,2-Dichloroethane	LT 6.	-01 ug/g	ECT003
			m-Xylene	LT 8.	-01 ug/g	ECT003
			Aldrin	LT 3.	-01 ug/g	BCS005
			Arsenic	LT 2.5	+00 ug/g	BBN024
			Atrazine	LT 3.	-01 ug/g	BCS005
			Bicycloheptadiene	LT 4.	-01 ug/g	ECT003
			Benzene	LT 3.	-01 ug/g	ECT003
			Carbon Tetrachloride	LT 3.	-01 ug/g	ECT003
			Cadmium	LT 7.4	-01 ug/g	BCX008
			Methylene Chloride	LT 2.	+00 ug/g	ECT003
			Chloroform	LT 3.	-01 ug/g	ECT003
			Hexachlorocyclopentadiene	LT 6.	-01 ug/g	BCS005
			Chlorobenzene	LT 1.	+00 ug/g	ECT003
			Chlordane	LT 2.	+00 ug/g	BCS005
			p-Chlorophenylmethyl Sulfide	LT 9.	-01 ug/g	BCS005
			p-Chlorophenylmethyl Sulfoxide	LT 3.	-01 ug/g	BCS005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	4-5	Soil	p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCS005
			Chromium	1.5 +01	ug/g	BCX008
			Copper	8.2 +00	ug/g	BCX008
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR008
			Dibromochloropropane	LT 3. -01	ug/g	BCS005
			Dibromochloropropane	LT 2. +00	ug/g	BCT003
			Dicyclopentadiene	LT 1. +00	ug/g	BCS005
			Dicyclopentadiene	LT 7. -01	ug/g	BCT003
			Vapors	LT 3. +00	ug/g	BCS005
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCS005
			Dithiane	LT 4. -01	ug/g	BCS005
			Dieldrin	LT 3. -01	ug/g	BCS005
			Dimethyldisulfide	LT 2. +01	ug/g	BCT003
			Endrin	LT 5. -01	ug/g	BCS005
			Ethylbenzene	LT 4. -01	ug/g	BCT003
			Mercury	LT 5.0 -02	ug/g	BCY008
			Hydrazine	LT 5. +01	ug/g	BCQ008
			Isodrin	LT 3. -01	ug/g	BCS005
			Toluene	LT 3. -01	ug/g	BCT003
			Methylhydrazine	LT 2. +02	ug/g	BCP011
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCT003
			Malathion	LT 7. -01	ug/g	BCS005
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN008
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN008
			1,4-Oxathiane	LT 3. -01	ug/g	BCS005
			Lead	LT 8.4 +00	ug/g	BCX008
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCS005
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCS005
			Parathion	LT 9. -01	ug/g	BCS005
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BCS005
			Tetrachloroethene	LT 3. -01	ug/g	BCT003
			Trichloroethene	LT 5. -01	ug/g	BCT003

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	4-5	Soil	Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BC0008
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BC1003
			Zinc	3.8 +01	ug/g	BCX008
0004	9-10	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BC1004
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BC1004
			1,1-Dichloroethane	LT 2. +00	ug/g	BC1004
			1,2-Dichloroethane	LT 2. +00	ug/g	BC1004
			1,2-Dichloroethane	LT 6. -01	ug/g	BC1004
			m-Xylene	LT 8. -01	ug/g	BC1004
			Aldrin	LT 3. -01	ug/g	BCS006
			Arsenic	LT 2.5 +00	ug/g	BC0008
			Atrazine	LT 3. -01	ug/g	BCS006
			Bicycloheptadiene	LT 4. -01	ug/g	BC1004
			Benzene	LT 3. -01	ug/g	BC1004
			Carbon Tetrachloride	LT 3. -01	ug/g	BC1004
			Cadmium	LT 7.4 -01	ug/g	BCX009
			Methylene Chloride	LT 2. +00	ug/g	BC1004
			Chloroform	LT 3. -01	ug/g	BC1004
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCS006
			Chlorobenzene	LT 1. +00	ug/g	BC1004
			Chlordane	LT 2. +00	ug/g	BCS006
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCS006
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCS006
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCS006
			Chromium	1.4 +01	ug/g	BCX009
			Copper	1.0 +01	ug/g	BCX009
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR009
			Dibromochloropropane	LT 3. -01	ug/g	BCS006
			Dibromochloropropane	LT 2. +00	ug/g	BC1004
			Dicyclopentadiene	LT 1. +00	ug/g	BCS006
			Dicyclopentadiene	LT 7. -01	ug/g	BC1004
			Vapona	LT 3. +00	ug/g	BCS006

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	9-10	Soil	Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCS006
			Dithiane	LT 4. -01	ug/g	BCS006
			Dieldrin	LT 3. -01	ug/g	BCS006
			Dimethyldisulfide	LT 2. +01	ug/g	BC1004
			Endrin	LT 5. -01	ug/g	BCS006
			Ethylbenzene	LT 4. -01	ug/g	BC1004
			Mercury	LT 5.0 -02	ug/g	BCY009
			Hydrazine	LT 5. +01	ug/g	BC0009
			Isodrin	LT 3. -01	ug/g	BCS006
			Toluene	LT 3. -01	ug/g	BC1004
			Methylhydrazine	LT 2. +02	ug/g	BCP012
			Methylisobutyl Ketone	LT 7. -01	ug/g	BC1004
			Malethion	LT 7. -01	ug/g	BCS006
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN009
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN009
			1,4-Oxathiane	LT 3. -01	ug/g	BCS006
			Lead	LT 8.4 +00	ug/g	BCX009
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCS006
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCS006
			Parathion	LT 9. -01	ug/g	BCS006
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCS006
			Tetrachloroethene	LT 3. -01	ug/g	BC1004
			Trichloroethene	LT 5. -01	ug/g	BC1004
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BC0009
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BC1004
			Zinc	4.1 +01	ug/g	BCX009
0004	14-15	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BC1005
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BC1005
			1,1-Dichloroethane	LT 2. +00	ug/g	BC1005
			1,2-Dichloroethane	LT 2. +00	ug/g	BC1005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	14-15	Soil	1,2-Dichloroethane	LT 6. -01	ug/g	BCT005
			m-Xylene	LT 8. -01	ug/g	BCT005
			Aldrin	LT 3. -01	ug/g	BCS007
			Arsenic	LT 2.5 +00	ug/g	BDC009
			Atrazine	LT 3. -01	ug/g	BCS007
			Bicycloheptadiene	LT 4. -01	ug/g	BCT005
			Benzene	LT 3. -01	ug/g	BCT005
			Carbon Tetrachloride	LT 3. -01	ug/g	BCT005
			Methylene Chloride	LT 2. +00	ug/g	BCT005
			Chloroform	LT 3. -01	ug/g	BCT005
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCS007
			Chlorobenzene	LT 1. +00	ug/g	BCT005
			Chlordane	LT 2. +00	ug/g	BCS007
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCS007
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCS007
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCS007
			Chromium	LT 6.5 +00	ug/g	BCX010
			Copper	4.3 +01	ug/g	BCX010
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR010
			Dibromochloropropane	LT 3. -01	ug/g	BCS007
			Dibromochloropropane	LT 2. +00	ug/g	BCT005
			Dicyclopentadiene	LT 1. +00	ug/g	BCS007
			Dicyclopentadiene	LT 7. -01	ug/g	BCT005
			Vapona	LT 3. +00	ug/g	BCS007
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCS007
			Dithiane	LT 4. -01	ug/g	BCS007
			Dieldrin	LT 3. -01	ug/g	BCS007
			Dimethyldisulfide	LT 2. +01	ug/g	BCT005
			Endrin	LT 5. -01	ug/g	BCS007
			Ethylbenzene	LT 4. -01	ug/g	BCT005
			Mercury	LT 5.0 -02	ug/g	BCY010
			Hydrazine	LT 5. +01	ug/g	BCQ010
			Isodrin	LT 3. -01	ug/g	BCS007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	14-15	Soil	Toluene	LT 3. -01	ug/g	BCT005
			Methylhydrazine	LT 2. -02	ug/g	BCP013
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCT005
			Malathion	LT 7. -01	ug/g	BCS007
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN010
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN010
			1,4-Oxathiane	LT 3. -01	ug/g	BCS007
			Lead	LT 8.4 +00	ug/g	BCX010
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCS007
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCS007
			Parathion	LT 9. -01	ug/g	BCS007
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCS007
			Tetrachloroethene	LT 3. -01	ug/g	BCT005
			Trichloroethene	LT 5. -01	ug/g	BCT005
0004	19-20	Soil	Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BC0010
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BCT005
			Zinc	1.0 +02	ug/g	BCX010
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BCT006
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BCT006
			1,1-Dichloroethane	LT 2. +00	ug/g	BCT006
			1,2-Dichloroethane	LT 2. +00	ug/g	BCT006
			1,2-Dichloroethane	LT 6. -01	ug/g	BCT006
			m-Xylene	LT 8. -01	ug/g	BCT006
			Aldrin	LT 3. -01	ug/g	BCS008
			Arsenic	LT 2.5 +00	ug/g	BC0010
			Atrazine	LT 3. -01	ug/g	BCS008
			Bicycloheptadiene	LT 4. -01	ug/g	BCT006
			Benzene	LT 3. -01	ug/g	BCT006
			Carbon Tetrachloride	LT 3. -01	ug/g	BCT006
			Cadmium	LT 7.4 -01	ug/g	BCX011
			Methylene Chloride	LT 2. +00	ug/g	BCT006

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	19-20	Soil	Chloroform	LT 3. -01	ug/g	BCI006
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCS008
			Chlorobenzene	LT 1. +00	ug/g	BCI006
			Chlordane	LT 2. +00	ug/g	BCS008
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCS008
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCS008
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCS008
			Chromium	LT 6.5 +00	ug/g	BCX011
			Copper	LT 4.7 +01	ug/g	BCX011
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR011
			Dibromochloropropane	LT 3. -01	ug/g	BCS008
			Dibromochloropropane	LT 2. +00	ug/g	BCI006
			Dicyclopentadiene	LT 1. +00	ug/g	BCS008
			Dicyclopentadiene	LT 7. -01	ug/g	BCI006
			Vapors	LT 3. +00	ug/g	BCS008
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCS008
			Dithiane	LT 4. -01	ug/g	BCS008
			Dieldrin	LT 3. -01	ug/g	BCS008
			Dimethyldisulfide	LT 2. +01	ug/g	BCI006
			Endrin	LT 5. -01	ug/g	BCS008
			Ethylbenzene	LT 4. -01	ug/g	BCI006
			Mercury	LT 5.0 -02	ug/g	BCY011
			Hydrazine	LT 5. +01	ug/g	BCQ011
			Isodrin	LT 3. -01	ug/g	BCS008
			Toluene	LT 3. -01	ug/g	BCI006
			Methylhydrazine	LT 2. +02	ug/g	BCP014
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCI006
			Malathion	LT 7. -01	ug/g	BCS008
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN011
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN011
			1,4-Oxathiane	LT 3. -01	ug/g	BCS008
			Lead	LT 8.4 +00	ug/g	BCX011
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCS008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	19-20	Soil	Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCS008
			Parathion	LT 9. -01	ug/g	BCS008
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BCS008
			Tetrachloroethene	LT 3. -01	ug/g	BC1006
			Trichloroethene	LT 5. -01	ug/g	BC1006
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BC0011
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BC1006
			Zinc	1.1 +02	ug/g	BCX011
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BC1006
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BC1006
0004	24-25	Soil	1,1-Dichloroethane	LT 2. +00	ug/g	BC1006
			1,2-Dichloroethane	LT 2. +00	ug/g	BC1006
			1,2-Dichloroethane	LT 6. -01	ug/g	BC1006
			m-Xylene	LT 8. -01	ug/g	BC1007
			Aldrin	LT 3. -01	ug/g	BCS009
			Arsenic	LT 2.5 +00	ug/g	BC0011
			Atrazine	LT 3. -01	ug/g	BCS009
			Bicycloheptadiene	LT 4. -01	ug/g	BC1006
			Benzene	LT 3. -01	ug/g	BC1006
			Carbon Tetrachloride	LT 3. -01	ug/g	BC1006
			Cadmium	LT 7.4 -01	ug/g	BCX012
			Methylene Chloride	LT 2. +00	ug/g	BC1006
			Chloroform	LT 3. -01	ug/g	BC1006
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCS009
			Chlorobenzene	LT 1. +00	ug/g	BC1006
			Chlordane	LT 2. +00	ug/g	BCS009
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCS009
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCS009
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCS009
			Chromium	1.1 +01	ug/g	BCX012

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	24-25	Soil	Copper	4.6 +01	ug/g	BCX012
			Dibromochloropropane	LT 5.0 -03	ug/g	BCR012
			Dibromochloropropane	LT 3. -01	ug/g	BCS009
			Dibromochloropropane	LT 2. +00	ug/g	BCI007
			Dicyclopentadiene	LT 1. +00	ug/g	BCS009
			Dicyclopentadiene	LT 7. -01	ug/g	BCI006
			Vapona	LT 3. +00	ug/g	BCS009
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCS009
			Dithiane	LT 4. -01	ug/g	BCS009
			Dieldrin	LT 3. -01	ug/g	BCS009
			Dimethyldisulfide	LT 2. +01	ug/g	BCI006
			Endrin	LT 5. -01	ug/g	BCS009
			Ethylbenzene	LT 4. -01	ug/g	BCI007
			Mercury	LT 5.0 -02	ug/g	BCY012
			Hydrazine	LT 5. +01	ug/g	BCO012
			Isodrin	LT 3. -01	ug/g	BCS009
			Toluene	LT 3. -01	ug/g	BCI006
			Methylhydrazine	LT 2. +02	ug/g	BCP015
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCI006
			Malathion	LT 7. -01	ug/g	BCS009
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN012
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN012
			1,4-Oxathiane	LT 3. -01	ug/g	BCS009
			Lead	LT 8.4 +00	ug/g	BCX012
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCS009
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCS009
			Parathion	LT 9. -01	ug/g	BCS009
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BCS009
			Tetrachloroethene	LT 3. -01	ug/g	BCI006
			Trichloroethene	LT 5. -01	ug/g	BCI006
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BCO012

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0004	24-25	Soil	Ortho- & Para-Xylene Zinc	LT 5. +00	ug/g	8CT007
				1.1 +02	ug/g	8CX012
0005	0-1	Soil	Aldrin Arsenic Atrazine Cadmium Hexachlorocyclopentadiene	LT 3. -01	ug/g	8CD004
				LT 2.5 +00	ug/g	8CNO16
				LT 3. -01	ug/g	8CD004
				LT 7.4 -01	ug/g	88P016
				LT 6. -01	ug/g	8CD004
				LT 2. +00	ug/g	8CD004
			Chlordane p-Chlorophenylmethyl Sulfide p-Chlorophenylmethyl Sulfoxide p-Chlorophenylmethyl Sulfone Chromium Copper Dibromochloropropane Dibromochloropropane Dicyclopentadiene Vapona Diisopropylmethyl Phosphonate Dithiane Dieldrin Endrin Mercury Hydrazine Isodrin Methylhydrazine Malathion N-Nitrosodimethylamine N-Nitrosodi-N-Propylamine 1,4-Oxathiane Lead Dichlorodiphenylethane Dichlorodiphenyltrichloro-ethane	LT 2. -01	ug/g	8CD004
				LT 9. -01	ug/g	8CD004
				LT 3. -01	ug/g	8CD004
				LT 3. -01	ug/g	8CD004
				LT 1.5 +01	ug/g	88P016
				1.0 +01	ug/g	88P016
				LT 5.0 -03	ug/g	8CC007
				LT 3. -01	ug/g	8CD004
				LT 1. +00	ug/g	8CD004
				LT 3. +00	ug/g	8CD004
				LT 1. +00	ug/g	8CD004
				LT 4. -01	ug/g	8CD004
				LT 3. -01	ug/g	8CD004
				LT 5. -01	ug/g	8CD004
				LT 5.0 -02	ug/g	880016
				LT 5. +01	ug/g	88Z013
LT 3. -01	ug/g	8CD004				
LT 2. +02	ug/g	88Y013				
LT 7. -01	ug/g	8CD004				
LT 2.6 -01	ug/g	8CA013				
				LT 1.0 -01	ug/g	8CA013
				LT 3. -01	ug/g	8CD004
				LT 1.6 +01	ug/g	88P016
				LT 6. -01	ug/g	8CD004
				LT 5. -01	ug/g	8CD004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions. Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0005	0-1	Soil	Parathion	LT 9. -01	ug/g	BCD004
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCD004
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BSX013
			Zinc	4.8 +01	ug/g	BSF016
0005	4-5	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BCED03
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BCED03
			1,1-Dichloroethane	LT 2. +00	ug/g	BCED03
			1,2-Dichloroethane	LT 2. +00	ug/g	BCED03
			1,2-Dichloroethane	LT 6. -01	ug/g	BCED03
			m-Xylene	LT 8. -01	ug/g	BCED03
			Aldrin	LT 3. -01	ug/g	BCD005
			Arsenic	LT 2.5 +00	ug/g	BSM017
			Atrazine	LT 3. -01	ug/g	BCD005
			Bicycloheptadiene	LT 4. -01	ug/g	BCED03
			Benzene	LT 3. -01	ug/g	BCED03
			Carbon Tetrachloride	LT 3. -01	ug/g	BCED03
			Cadmium	LT 7.4 -01	ug/g	BSF017
			Methylene Chloride	LT 2. +00	ug/g	BCED03
			Chloroform	LT 3. -01	ug/g	BCED03
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCD005
			Chlorobenzene	LT 1. +00	ug/g	BCED03
			Chlordane	LT 2. +00	ug/g	BCD005
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCD005
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCD005
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCD005
			Chromium	1.3 +01	ug/g	BSF017
			Copper	8.0 +00	ug/g	BSF017
			Dibromochloropropane	LT 5.0 -03	ug/g	BCC008
			Dibromochloropropane	LT 3. -01	ug/g	BCD005
			Dibromochloropropane	LT 2. +00	ug/g	BCED03
			Dicyclopentadiene	LT 1. +00	ug/g	BCD005
			Dicyclopentadiene	LT 7. -01	ug/g	BCED03

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0005	4-5	Soil	Vapors	LT 3. +00	ug/g	BCD005
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCD005
			Dithiane	LT 4. -01	ug/g	BCD005
			Dieldrin	LT 3. -01	ug/g	BCD005
			Dimethyldisulfide	LT 2. +01	ug/g	BCE003
			Endrin	LT 5. -01	ug/g	BCD005
			Ethylbenzene	LT 4. -01	ug/g	BCE003
			Mercury	LT 5.0 -02	ug/g	BS0017
			Hydrazine	LT 5. +01	ug/g	BS2014
			Isodrin	LT 3. -01	ug/g	BCD005
			Toluene	LT 3. -01	ug/g	BCE003
			Methylhydrazine	LT 2. +02	ug/g	BSY014
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCE003
			Malathion	LT 7. -01	ug/g	BCD005
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	SCA014
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	SCA014
			1,4-Oxathiane	LT 3. -01	ug/g	BCD005
			Lead	LT 8.4 +00	ug/g	BSF017
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCD005
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCD005
0006	0-1	Soil	Parathion	LT 9. -01	ug/g	BCD005
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCD005
			Tetrachloroethene	LT 3. -01	ug/g	BCE003
			Trichloroethene	LT 5. -01	ug/g	BCE003
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BSX014
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BCE003
			Zinc	3.3 +01	ug/g	BSF017
			Aldrin	LT 3. -01	ug/g	BCD002
			Arsenic	LT 2.5 +00	ug/g	BSN014
			Atrazine	LT 3. -01	ug/g	BCD002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0006	0-1	Soil	Cadmium	LT 7.4 -01	ug/g	88P014
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	8CD002
			Chlordane	LT 2. +00	ug/g	8CD002
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	8CD002
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	8CD002
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	8CD002
			Chromium	2.0 +01	ug/g	88P014
			Copper	1.1 +01	ug/g	88P014
			Dibromochloropropane	LT 5.0 -03	ug/g	8CC005
			Dibromochloropropane	LT 3. -01	ug/g	8CD002
			Dicyclopentadiene	LT 1. +00	ug/g	8CD002
			Vapona	LT 3. +00	ug/g	8CD002
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	8CD002
			Dithiane	LT 4. -01	ug/g	8CD002
			Dieldrin	LT 3. -01	ug/g	8CD002
			Endrin	LT 5. -01	ug/g	8CD002
			Mercury	LT 5.0 -02	ug/g	880014
			Hydrazine	LT 5. +01	ug/g	88Z011
			Isodrin	LT 3. -01	ug/g	8CD002
			Methylhydrazine	LT 2. +02	ug/g	88Y011
			Malathion	LT 7. -01	ug/g	8CD002
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	8CA011
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	8CA011
			1,4-Oxathiane	LT 3. -01	ug/g	8CD002
			Lead	1.3 +01	ug/g	88P014
			Dichlorodiphenylethane	LT 6. -01	ug/g	8CD002
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	8CD002
			Parathion	LT 9. -01	ug/g	8CD002
			2-Chloro-1(2,4-Dichlorophenyl)	LT 6. -01	ug/g	8CD002
			Vinylidethyl Phosphates	LT 2. +02	ug/g	88X011
			Unsymmetrical Dimethyl Hydrazine	4.3 +01	ug/g	88P014
			Zinc			

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0006	4-5	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BCE002
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BCE002
			1,1-Dichloroethane	LT 2. +00	ug/g	BCE002
			1,2-Dichloroethane	LT 2. +00	ug/g	BCE002
			1,2-Dichloroethane	LT 6. -01	ug/g	BCE002
			m-Xylene	LT 8. -01	ug/g	BCE002
			Aldrin	LT 3. -01	ug/g	BCD003
			Arsenic	LT 2.5 +00	ug/g	BBN015
			Atrazine	LT 3. -01	ug/g	BCD003
			Bicycloheptadiene	LT 4. -01	ug/g	BCE002
			Benzene	LT 3. -01	ug/g	BCE002
			Carbon Tetrachloride	LT 3. -01	ug/g	BCE002
			Cadmium	LT 7.4 -01	ug/g	BBP015
			Methylene Chloride	LT 2. +00	ug/g	BCE002
			Chloroform	LT 3. -01	ug/g	BCE002
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCD003
			Chlorobenzene	LT 1. +00	ug/g	BCE002
			Chlordane	LT 2. +00	ug/g	BCD003
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCD003
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCD003
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCD003
			Chromium	1.8 +01	ug/g	BBP015
			Copper	1.4 +01	ug/g	BBP015
			Dibromochloropropane	LT 5.0 -03	ug/g	BCC006
			Dibromochloropropane	LT 3. -01	ug/g	BCD003
			Dibromochloropropane	LT 2. +00	ug/g	BCE002
			Dicyclopentadiene	LT 1. +00	ug/g	BCD003
			Dicyclopentadiene	LT 7. -01	ug/g	BCE002
			Vapona	LT 3. +00	ug/g	BCD003
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCD003
			Dithiane	LT 4. -01	ug/g	BCD003
			Dieldrin	LT 3. -01	ug/g	BCD003
			Dimethyldisulfide	LT 2. +01	ug/g	BCE002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0006	4-5	Soil	Endrin	LT 5. -01	ug/g	BCD003
			Ethylbenzene	LT 4. -01	ug/g	BCE002
			Mercury	LT 5.0 -02	ug/g	BB0015
			Hydrazine	LT 5. +01	ug/g	BBZ012
			Isodrin	LT 3. -01	ug/g	BCD003
			Toluene	LT 3. -01	ug/g	BCE002
			Methylhydrazine	LT 2. +02	ug/g	BBY012
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCE002
			Malathion	LT 7. -01	ug/g	BCD003
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCA012
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCA012
			1,4-Oxathiane	LT 3. -01	ug/g	BCD003
			Lead	LT 8.4 +00	ug/g	BBP015
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCD003
			Dichlorodiphenyltrichloro-ethane	LT 5. -01	ug/g	BCD003
			Parathion	LT 9. -01	ug/g	BCD003
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BCD003
			Tetrachloroethene	LT 3. -01	ug/g	BCE002
			Trichloroethene	LT 5. -01	ug/g	BCE002
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BBX012
0007	0-1	Soil	Ortho- & Para-Xylene	LT 5. +00	ug/g	BCE002
			Zinc	6.0 +01	ug/g	BBP015
			Aldrin	LT 3. -01	ug/g	BCD006
			Arsenic	LT 2.5 +00	ug/g	BBN018
			Atrazine	LT 3. -01	ug/g	BCD006
			Cadmium	LT 7.4 -01	ug/g	BBP018
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCD006
			Chlordane	LT 2. +00	ug/g	BCD006
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCD006
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCD006

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0007	0-1	Soil	p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCD006
			Chromium	1.1 +01	ug/g	BBP018
			Copper	1.0 +01	ug/g	BBP018
			Dibromochloropropane	LT 5.0 -03	ug/g	BCD009
			Dibromochloropropane	LT 3. -01	ug/g	BCD006
			Dicyclopentadiene	LT 1. +00	ug/g	BCD006
			Vapona	LT 3. +00	ug/g	BCD006
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCD006
			Dithiane	LT 4. -01	ug/g	BCD006
			Diethrin	LT 3. -01	ug/g	BCD006
			Endrin	LT 5. -01	ug/g	BCD006
			Mercury	LT 5.0 -02	ug/g	BB0018
			Hydrazine	LT 5. +01	ug/g	BBZ015
			Isodrin	LT 3. -01	ug/g	BCD006
			Methylhydrazine	LT 2. +02	ug/g	BBY015
			Malathion	LT 7. -01	ug/g	BCD006
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCAQ15
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCAQ15
			1,4-Oxathiane	LT 3. -01	ug/g	BCD006
			Lead	1.2 +02	ug/g	BBP018
0007	4-5	Soil	Dichlorodiphenylethane	LT 6. -01	ug/g	BCD006
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCD006
			Parathion	LT 9. -01	ug/g	BCD006
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCD006
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BBX015
			Zinc	3.8 +01	ug/g	BBP018
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BCE004
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BCE004
			1,1-Dichloroethane	LT 2. +00	ug/g	BCE004
			1,2-Dichloroethane	LT 2. +00	ug/g	BCE004
			1,2-Dichloroethane	LT 6. -01	ug/g	BCE004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Ebasco Services Incorporated **Rocky Mountain Arsenal Program** **11/11/86**
Summary of Analytical Results **Task 11, Site 1-7** **Hydrazine Blending and Storage Facility**

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0007	4-5	Soil	m-Xylene	LT 8. -01	ug/g	BCE004
			Aldrin	LT 3. -01	ug/g	BCD007
			Arsenic	LT 2.5 +00	ug/g	BBN019
			Atrazine	LT 3. -01	ug/g	BCD007
			Bicycloheptadiene	LT 4. -01	ug/g	BCE004
			Benzene	LT 3. -01	ug/g	BCE004
			Carbon Tetrachloride	LT 3. -01	ug/g	BCE004
			Cadmium	LT 7.4 -01	ug/g	BBP019
			Methylene Chloride	LT 2. +00	ug/g	BCE004
			Chloroform	LT 3. -01	ug/g	BCE004
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCD007
			Chlorobenzene	LT 1. +00	ug/g	BCE004
			Chloroform	LT 2. +00	ug/g	BCD007
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCD007
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCD007
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCD007
			Chromium	8.6 +00	ug/g	BBP019
			Copper	LT 4.7 +00	ug/g	BBP019
			Dibromochloropropane	LT 5.0 -03	ug/g	BCC010
			Dibromochloropropane	LT 3. -01	ug/g	BCD007
			Dibromochloropropane	LT 2. +00	ug/g	BCE004
			Dicyclopentadiene	LT 1. +00	ug/g	BCD007
			Dicyclopentadiene	LT 7. -01	ug/g	BCE004
			Vapona	LT 3. +00	ug/g	BCD007
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCD007
			Dithiene	LT 4. -01	ug/g	BCD007
			Dieldrin	LT 3. -01	ug/g	BCD007
			Dimethyldisulfide	LT 2. +01	ug/g	BCE004
			Endrin	LT 5. -01	ug/g	BCD007
			Ethylbenzene	LT 4. -01	ug/g	BCE004
			Mercury	LT 5.0 -02	ug/g	BB0019
			Hydrazine	LT 5. +01	ug/g	BB2016
			Isodrin	LT 3. -01	ug/g	BCD007
			Toluene	LT 3. -01	ug/g	BCE004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0007	4-5	Soil	Methylhydrazine	LT 2. +02	ug/g	BSY016
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCE004
			Malathion	LT 7. -01	ug/g	BCD007
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCA016
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCA016
			1,4-Oxathiane	LT 3. -01	ug/g	BCD007
			Lead	LT 8.4 +00	ug/g	BSY019
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCD007
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCD007
			Parathion	LT 9. -01	ug/g	BCD007
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCD007
			Tetrachloroethene	LT 3. -01	ug/g	BCE004
			Trichloroethene	LT 5. -01	ug/g	BCE004
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BSY016
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BCE004
			Zinc	2.4 +01	ug/g	BSY019
	9-10	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BCE005
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BCE005
			1,1-Dichloroethane	LT 2. +00	ug/g	BCE005
			1,2-Dichloroethane	LT 2. +00	ug/g	BCE005
			1,2-Dichloroethane	LT 6. -01	ug/g	BCE005
			m-Xylene	LT 8. -01	ug/g	BCE005
			Aldrin	LT 3. -01	ug/g	BCD008
			Arsenic	LT 2.5 +00	ug/g	BSN020
			Atrazine	LT 3. -01	ug/g	BCD008
			Bicycloheptadiene	LT 4. -01	ug/g	BCE005
			Benzene	LT 3. -01	ug/g	BCE005
			Carbon Tetrachloride	LT 3. -01	ug/g	BCE005
			Cadmium	LT 7.4 -01	ug/g	BSY020
			Methylene Chloride	LT 2. +00	ug/g	BCE005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0007	9-10	Soil	Chloroform	LT 3. -01	ug/g	BCE005
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCD008
			Chlorobenzene	LT 1. +00	ug/g	BCE005
			Chlordane	LT 2. +00	ug/g	BCD008
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCD008
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCD008
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCD008
			Chromium	1.2 +01	ug/g	BBP020
			Copper	4.0 +01	ug/g	BBP020
			Dibromochloropropane	LT 5.0 -03	ug/g	BCC011
			Dibromochloropropane	LT 3. -01	ug/g	BCD008
			Dibromochloropropane	LT 2. +00	ug/g	BCE005
			Dicyclopentadiene	LT 1. +00	ug/g	BCD008
			Dicyclopentadiene	LT 7. -01	ug/g	BCE005
			Vapors	LT 3. +00	ug/g	BCD008
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCD008
			Dithiane	LT 4. -01	ug/g	BCD008
			Dieldrin	LT 3. -01	ug/g	BCD008
			Dimethyldisulfide	LT 2. +01	ug/g	BCE005
			Endrin	LT 5. -01	ug/g	BCD008
			Ethylbenzene	LT 4. -01	ug/g	BCE005
			Mercury	LT 5.0 -02	ug/g	BB0020
			Hydrazine	LT 5. +01	ug/g	BBZ017
			Isodrin	LT 3. -01	ug/g	BCD008
			Toluene	LT 3. -01	ug/g	BCE005
			Methylhydrazine	LT 2. +02	ug/g	BBY017
			Methylisobutyl Ketone	LT 7. -01	ug/g	BCE005
			Malathion	LT 7. -01	ug/g	BCD008
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCA017
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCA017
			1,4-Oxathiane	LT 3. -01	ug/g	BCD008
			Lead	2.2 +01	ug/g	BBP020
			Dichlorodiphenylethane	LT 6. -01	ug/g	BCD008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0007	9-10	Soil	Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCD008
			Parathion	LT 9. -01	ug/g	BCD008
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCD008
			Tetrachloroethene	LT 3. -01	ug/g	BCE005
			Trichloroethene	LT 5. -01	ug/g	BCE005
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BBX017
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BCE005
			Zinc	9.8 +01	ug/g	BBP020
0008	0-1	Soil	Aldrin	LT 3. -01	ug/g	BBM002
			Arsenic	3.1 +00	ug/g	BBN005
			Atrazine	LT 3. -01	ug/g	BBM002
			Cadmium	LT 7.4 -01	ug/g	BBP005
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BBM002
			Chlordane	LT 2. +00	ug/g	BBM002
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BBM002
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BBM002
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BBM002
			Chromium	1.7 +01	ug/g	BBP005
			Copper	1.2 +01	ug/g	BBP005
			Dibromochloropropane	LT 5.0 -03	ug/g	BBK005
			Dibromochloropropane	LT 3. -01	ug/g	BBM002
			Dicyclopentadiene	LT 1. +00	ug/g	BBM002
			Vapona	LT 3. +00	ug/g	BBM002
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BBM002
			Dithiane	LT 4. -01	ug/g	BBM002
			Diieldrin	LT 3. -01	ug/g	BBM002
			Endrin	LT 5. -01	ug/g	BBM002
			Mercury	LT 5.0 -02	ug/g	BB0005
			Hydrazine	LT 5. +01	ug/g	BBG005
			Isodrin	LT 3. -01	ug/g	BBM002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0008	0-1	Soil	Methylhydrazine	LT 2. +02	ug/g	88J005
			Malathion	LT 7. -01	ug/g	88M002
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	88I005
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	88I005
			1,4-Oxathiane	LT 3. -01	ug/g	88M002
			Lead	LT 1.7 +01	ug/g	88P005
			Dichlorodiphenylethane	LT 6. -01	ug/g	88M002
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	88M002
			Parathion	LT 9. -01	ug/g	88M002
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	88M002
0008	4-5	Soil	Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	88M005
			Zinc	5.2 +01	ug/g	88P005
			1,1,1-Trichloroethane	LT 4. -01	ug/g	88L002
			1,1,2-Trichloroethane	LT 4. -01	ug/g	88L002
			1,1-Dichloroethane	LT 2. +00	ug/g	88L002
			1,2-Dichloroethane	LT 2. +00	ug/g	88L002
			1,2-Dichloroethane	LT 6. -01	ug/g	88L002
			m-Xylene	LT 8. -01	ug/g	88L002
			Aldrin	LT 3. -01	ug/g	88M003
			Arsenic	LT 2.5 +00	ug/g	88M006
			Atrazine	LT 3. -01	ug/g	88M003
			Bicycloheptadiene	LT 4. -01	ug/g	88L002
			Benzene	LT 3. -01	ug/g	88L002
			Carbon Tetrachloride	LT 3. -01	ug/g	88L002
			Cadmium	LT 7.4 -01	ug/g	88P006
			Methylene Chloride	LT 2. +00	ug/g	88L002
			Chloroform	LT 3. -01	ug/g	88L002
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	88M003
			Chlorobenzene	LT 1. +00	ug/g	88L002
			Chlordane	LT 2. +00	ug/g	88M003
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	88M003

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Task 11, Site 1-7 Hydrizine Blending and Storage Facility

Summary of Analytical Results

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0008	4-5	Soil	p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	88M003
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	88M003
			Chromium	1.0 +01	ug/g	88P006
			Copper	2.2 +01	ug/g	88P006
			Dibromochloropropane	LT 5.0 -03	ug/g	88K006
			Dibromochloropropane	LT 2. +00	ug/g	88L002
			Dibromochloropropane	LT 3. -01	ug/g	88M003
			Dicyclopentadiene	LT 7. -01	ug/g	88L002
			Dicyclopentadiene	LT 1. +00	ug/g	88M003
			Vapona	LT 3. +00	ug/g	88M003
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	88M003
			Dithiane	LT 4. -01	ug/g	88M003
			Dieldrin	LT 3. -01	ug/g	88M003
			Dimethyldisulfide	LT 2. +01	ug/g	88L002
			Endrin	LT 5. -01	ug/g	88M003
			Ethylbenzene	LT 4. -01	ug/g	88L002
			Mercury	LT 5.0 -02	ug/g	880006
			Hydrazine	LT 5. +01	ug/g	88G006
			Isodrin	LT 3. -01	ug/g	88M003
			Toluene	LT 3. -01	ug/g	88L002
			Methylhydrazine	LT 2. +02	ug/g	88J006
			Methylisobutyl Ketone	LT 7. -01	ug/g	88L002
			Malathion	LT 7. -01	ug/g	88M003
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	88I006
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	88I006
			1,4-Oxathiane	LT 3. -01	ug/g	88M003
			Lead	LT 8.4 +00	ug/g	88P006
			Dichlorodiphenylethane	LT 6. -01	ug/g	88M003
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	88M003
			Parathion	LT 9. -01	ug/g	88M003
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	88M003

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0008	4-5	Soil	Tetrachloroethene	LT 3. -01	ug/g	88L002
			Trichloroethene	LT 5. -01	ug/g	88L002
			Unsymmetrical Dimethyl	LT 2. +02	ug/g	88H006
			Hydrazine	LT 5. +00	ug/g	88L002
			Ortho- & Para-Xylene	5.8 +01	ug/g	88P006
0008	9-10	Soil	Zinc			
			1,1,1-Trichloroethane	LT 4. -01	ug/g	88L003
			1,1,2-Trichloroethane	LT 4. -01	ug/g	88L003
			1,1-Dichloroethane	LT 2. +00	ug/g	88L003
			1,2-Dichloroethane	LT 6. -01	ug/g	88L003
			m-Xylene	LT 8. -01	ug/g	88L003
			Aldrin	LT 3. -01	ug/g	88M004
			Arsenic	LT 2.5 +00	ug/g	88N007
			Atrazine	LT 3. -01	ug/g	88M004
			Bicycloheptadiene	LT 4. -01	ug/g	88L003
			Benzene	LT 3. -01	ug/g	88L003
			Carbon Tetrachloride	LT 3. -01	ug/g	88L003
			Cadmium	LT 7.4 -01	ug/g	88P007
			Methylene Chloride	LT 2. +00	ug/g	88L003
			Chloroform	LT 3. -01	ug/g	88L003
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	88M004
			Chlorobenzene	LT 1. +00	ug/g	88L003
			Chlordane	LT 2. +00	ug/g	88M004
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	88M004
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	88M004
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	88M004
			Chromium	1.7 +01	ug/g	88P007
			Copper	1.9 +01	ug/g	88P007
			Dibromochloropropane	LT 5.0 -03	ug/g	88K007
			Dibromochloropropane	LT 2. +00	ug/g	88L003
			Dibromochloropropane	LT 3. -01	ug/g	88M004
			Dicyclopentadiene	LT 7. -01	ug/g	88L003

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0008	9-10	Soil	Dicyclopentadiene	LT 1. +00	ug/g	88M004
			Vapona	LT 3. +00	ug/g	88M004
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	88M004
			Dithiane	LT 4. -01	ug/g	88M004
			Dieldrin	LT 3. -01	ug/g	88M004
			Dimethyldisulfide	LT 2. +01	ug/g	88L003
			Endrin	LT 5. -01	ug/g	88M004
			Ethylbenzene	LT 4. -01	ug/g	88L003
			Mercury	LT 5.0 -02	ug/g	88G007
			Hydrazine	LT 5. +01	ug/g	88G007
			Isodrin	LT 3. -01	ug/g	88M004
			Toluene	LT 3. -01	ug/g	88L003
			Methylhydrazine	LT 2. +02	ug/g	88J007
			Methylisobutyl Ketone	LT 7. -01	ug/g	88L003
			Malethion	LT 7. -01	ug/g	88M004
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	88I007
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	88I007
			1,4-Oxathiane	LT 3. -01	ug/g	88M004
			Lead	1.3 +01	ug/g	88P007
			Dichlorodiphenylethane	LT 6. -01	ug/g	88M004
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	88M004
			Parathion	LT 9. -01	ug/g	88M004
			2-Chloro-1(2,4-Dichlorophenyl)vinylethyl Phosphates	LT 6. -01	ug/g	88M004
			Tetrachloroethene	LT 3. -01	ug/g	88L003
			Trichloroethene	LT 5. -01	ug/g	88L003
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	88M007
			Ortho- & Para-Xylene	LT 5. +00	ug/g	88L003
			Zinc	6.0 +01	ug/g	88P007
0009	4-5	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	88G008
			1,1,2-Trichloroethane	LT 4. -01	ug/g	88G008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0009	4-5	Soil	1,1-Dichloroethane	LT 2. +00	ug/g	BEG008
			1,2-Dichloroethane	LT 2. +00	ug/g	BEG008
			1,2-Dichloroethane	LT 6. -01	ug/g	BEG008
			m-Xylene	LT 8. -01	ug/g	BEG008
			Aldrin	LT 3. -01	ug/g	BED010
			Arsenic	4.2 +00	ug/g	BFH005
			Atrazine	LT 3. -01	ug/g	BED010
			Bicycloheptadiene	LT 4. -01	ug/g	BEG008
			Benzene	LT 3. -01	ug/g	BEG008
			Carbon Tetrachloride	LT 3. -01	ug/g	BEG008
			Cadmium	LT 7.4 -01	ug/g	BEK013
			Methylene Chloride	LT 2. +00	ug/g	BEG008
			Chloroform	LT 3. -01	ug/g	BEG308
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BED010
			Chlorobenzene	LT 1. +00	ug/g	BEG008
			Chloroethane	LT 2. +00	ug/g	BED010
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BED010
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BED010
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BED010
			Chromium	1.6 +01	ug/g	BEK013
			Copper	1.8 +01	ug/g	BEK013
			Dibromochloropropane	LT 5.0 -03	ug/g	BEK013
			Dibromochloropropane	LT 3. -01	ug/g	BED010
			Dibromochloropropane	LT 2. +00	ug/g	BEG008
			Dicyclopentadiene	LT 1. +00	ug/g	BED010
			Dicyclopentadiene	LT 7. -01	ug/g	BEG008
			Vapone	LT 3. +00	ug/g	BED010
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BED010
			Dithiane	LT 4. -01	ug/g	BED010
			Dieldrin	LT 3. -01	ug/g	BED010
			Dimethyldisulfide	LT 2. +01	ug/g	BEG008
			Endrin	LT 5. -01	ug/g	BED010
			Ethylbenzene	LT 4. -01	ug/g	BEG008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0009	4-5	Soil	Mercury	LT 5.0	-02 ug/g	BE0009
			Hydrazine	LT 5.	+01 ug/g	BE0013
			Isodrin	LT 3.	-01 ug/g	BE0010
			Toluene	LT 3.	-01 ug/g	BE0008
			Methylhydrazine	LT 2.	+02 ug/g	BE0013
			Methylisobutyl Ketone	LT 7.	-01 ug/g	BE0008
			Malathion	LT 7.	-01 ug/g	BE0010
			N-Nitrosodimethylamine	LT 2.6	-01 ug/g	BE0013
			N-Nitrosodi-N-Propylamine	LT 1.0	-01 ug/g	BE0013
			1,4-Oxathiane	LT 3.	-01 ug/g	BE0010
			Lead	1.9	+01 ug/g	BE0013
			Dichlorodiphenylethane	LT 6.	-01 ug/g	BE0010
			Dichlorodiphenyltrichloroethane	LT 5.	-01 ug/g	BE0010
			Parathion	LT 9.	-01 ug/g	BE0010
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6.	-01 ug/g	BE0010
			Tetrachloroethene	LT 3.	-01 ug/g	BE0008
			Trichloroethene	LT 5.	-01 ug/g	BE0008
			Unsymmetrical Dimethyl Hydrazine	LT 2.	+02 ug/g	BE0013
			Ortho- & Para-Xylene	LT 5.	+00 ug/g	BE0008
			Zinc	8.0	+01 ug/g	BE0013
0010	0-1	Soil	Aldrin	LT 3.	-01 ug/g	BE0002
			Arsenic	LT 2.5	+00 ug/g	BE0012
			Atrazine	LT 3.	-01 ug/g	BE0002
			Cadmium	LT 7.4	-01 ug/g	BE0020
			Hexachlorocyclopentadiene	LT 6.	-01 ug/g	BE0002
			Chlordane	LT 2.	+00 ug/g	BE0002
			p-Chlorophenylmethyl Sulfide	LT 9.	-01 ug/g	BE0002
			p-Chlorophenylmethyl Sulfoxide	LT 3.	-01 ug/g	BE0002
			p-Chlorophenylmethyl Sulfone	LT 3.	-01 ug/g	BE0002
			Chromium	1.0	+01 ug/g	BE0020

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0010	0-1	Soil	Copper	1.2 +01	ug/g	BEK020
			Dibromochloropropane	LT 5.0 -03	ug/g	BEP005
			Dibromochloropropane	LT 3. -01	ug/g	BEU002
			Dicyclopentadiene	LT 1. +00	ug/g	BEU002
			Vapors	LT 3. +00	ug/g	BEU002
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU002
			Dithiane	LT 4. -01	ug/g	BEU002
			Dieldrin	LT 3. -01	ug/g	BEU002
			Endrin	LT 5. -01	ug/g	BEU002
			Mercury	LT 5.0 -02	ug/g	BEU020
			Hydrazine	LT 5. +01	ug/g	BEU005
			Isodrin	LT 3. -01	ug/g	BEU002
			Methylhydrazine	LT 2. +02	ug/g	BEU005
			Malathion	LT 7. -01	ug/g	BEU002
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEU005
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEU005
			1,4-Oxathiane	LT 3. -01	ug/g	BEU002
			Lead	2.1 +01	ug/g	BEK020
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEU002
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEU002
0010	4-5	Soil	Parathion	LT 9. -01	ug/g	BEU002
			2-Chloro-1(2,4-Dichlorophenyl)	LT 6. -01	ug/g	BEU002
			Vinylidethyl Phosphates	LT 2. +02	ug/g	BEU005
			Unsymmetrical Dimethyl	5.6 +01	ug/g	BEK020
			Hydrazine	LT 4. -01	ug/g	BEU002
			Zinc	LT 4. -01	ug/g	BEU002
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BEU002
			1,1,2-Trichloroethane	LT 2. +00	ug/g	BEU002
			1,1-Dichloroethane	LT 2. +00	ug/g	BEU002
			1,2-Dichloroethane	LT 6. -01	ug/g	BEU002
			1,2-Dichloroethane	LT 8. -01	ug/g	BEU002
			m-Xylene	LT 3. -01	ug/g	BEU003
			Aldrin			

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0010	4-5	Soil	Arsenic	LT 2.5 +00	ug/g	BFH013
			Atrazine	LT 3. -01	ug/g	BEU003
			Bicycloheptadiene	LT 4. -01	ug/g	BEV002
			Benzene	LT 3. -01	ug/g	BEV002
			Carbon Tetrachloride	LT 3. -01	ug/g	BEV002
			Cadmium	LT 7.4 -01	ug/g	BF1005
			Methylene Chloride	LT 2. +00	ug/g	BEV002
			Chloroform	LT 3. -01	ug/g	BEV002
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEU003
			Chlorobenzene	LT 1. +00	ug/g	BEV002
			Chlordane	LT 2. +00	ug/g	BEU003
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEU003
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEU003
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEU003
			Chromium	9.4 +00	ug/g	BF1005
			Copper	6.7 +00	ug/g	BF1005
			Dibromochloropropane	LT 5.0 -03	ug/g	BEF006
			Dibromochloropropane	LT 3. -01	ug/g	BEU003
			Dibromochloropropane	LT 2. +00	ug/g	BEV002
			Dicyclopentadiene	LT 1. +00	ug/g	BEU003
			Dicyclopentadiene	LT 7. -01	ug/g	BEV002
			Vapona	LT 3. +00	ug/g	BEU003
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU003
			Dithiane	LT 4. -01	ug/g	BEU003
			Dieldrin	LT 3. -01	ug/g	BEU003
			Dimethyldisulfide	LT 2. +01	ug/g	BEV002
			Endrin	LT 5. -01	ug/g	BEU003
			Ethylbenzene	LT 4. -01	ug/g	BEV002
			Mercury	LT 5.0 -02	ug/g	BFJ005
			Hydrazine	LT 5. +01	ug/g	BEJ006
			Isodrin	LT 3. -01	ug/g	BEU003
			Toluene	LT 3. -01	ug/g	BEV002
			Methylhydrazine	LT 2. +02	ug/g	BEJ006

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0010	4-5	Soil	Methylisobutyl Ketone	1.0 +00	ug/g	BEV002
			Malethion	LT 7. -01	ug/g	BEU003
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BE0006
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BE0006
			1,4-Oxathiane	LT 3. -01	ug/g	BEU003
			Lead	LT 8.4 +00	ug/g	BF1005
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEU003
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEU003
			Parathion	LT 9. -01	ug/g	BEU003
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BEU003
			Tetrachloroethene	LT 3. -01	ug/g	BEV002
			Trichloroethene	LT 5. -01	ug/g	BEV002
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BE0006
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BEV002
			Zinc	3.4 +01	ug/g	BF1005
0010	9-10	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BEV003
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BEV003
			1,1-Dichloroethane	LT 2. +00	ug/g	BEV003
			1,2-Dichloroethane	LT 2. +00	ug/g	BEV003
			1,2-Dichloroethane	LT 6. -01	ug/g	BEV003
			m-Xylene	LT 8. -01	ug/g	BEV003
			Aldrin	LT 3. -01	ug/g	BEU004
			Arsenic	LT 2.5 +00	ug/g	BFM014
			Atrazine	LT 3. -01	ug/g	BEU004
			Bicycloheptadiene	LT 4. -01	ug/g	BEV003
			Benzene	LT 3. -01	ug/g	BEV003
			Carbon Tetrachloride	LT 3. -01	ug/g	BEV003
			Cadmium	LT 7.4 -01	ug/g	BF1006
			Methylene Chloride	LT 2. +00	ug/g	BEV003
			Chloroform	LT 3. -01	ug/g	BEV003

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0010	9-10	Soil	Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEU004
			Chlorobenzene	LT 1. +00	ug/g	BEV003
			Chlordane	LT 2. +00	ug/g	BEU004
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEU004
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEU004
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEU004
			Chromium	LT 6.5 +00	ug/g	BF1006
			Copper	LT 1.3 +01	ug/g	BF1006
			Dibromochloropropane	LT 5.0 -03	ug/g	BEP007
			Dibromochloropropane	LT 3. -01	ug/g	BEU004
			Dibromochloropropane	LT 2. +00	ug/g	BEV003
			Dicyclopentadiene	LT 1. +00	ug/g	BEU004
			Dicyclopentadiene	LT 7. -01	ug/g	BEV003
			Vapona	LT 3. +00	ug/g	BEU004
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU004
			Dithiane	LT 4. -01	ug/g	BEU004
			Dieldrin	LT 3. -01	ug/g	BEU004
			Dimethyldisulfide	LT 2. +01	ug/g	BEV003
			Endrin	LT 5. -01	ug/g	BEU004
			Ethylbenzene	LT 4. -01	ug/g	BEV003
			Mercury	LT 5.0 -02	ug/g	BFJ006
			Hydrazine	LT 5. +01	ug/g	BEV007
			Isodrin	LT 3. -01	ug/g	BEU004
			Toluene	LT 3. -01	ug/g	BEV003
			Methylhydrazine	LT 2. +02	ug/g	BEV007
			Methylisobutyl Ketone	LT 7. -01	ug/g	BEV003
			Malathion	LT 7. -01	ug/g	BEU004
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEV007
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEV007
			1,4-Oxathiane	LT 3. -01	ug/g	BEU004
			Lead	LT 8.4 +00	ug/g	BF1006
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEU004
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEU004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions. Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0011	0-1	Soil	N-Nitrosodimethylamine	LT 2.6 -01	ug/g	SDU005
			N-Nitrosodi-N-Propylamine	LT 1.7 -01	ug/g	SDU005
			1,4-Oxathiane	LT 6. +00	ug/g	SDP002
			Lead	2.1 +01	ug/g	BCX016
			Dichlorodiphenylethane	LT 3. -01	ug/g	SDP002
			Dichlorodiphenyltrichloroethane	LT 6. -01	ug/g	SDP002
			Parathion	LT 4. -01	ug/g	SDP002
			2-Chloro-1(2,4-Dichlorophenyl)	LT 3. -01	ug/g	SDP002
			Vinylidietyl Phosphates	LT 2. +02	ug/g	SDR005
			Unsymmetrical Dimethyl	1.1 +02	ug/g	BCX016
0011	4-5	Soil	Hydrazine			
			Zinc			
			1,1,1-Trichloroethane	LT 3. -01	ug/g	SDM002
			1,1,2-Trichloroethane	LT 3. -01	ug/g	SDM002
			1,1-Dichloroethane	LT 9. -01	ug/g	SDM002
			1,2-Dichloroethane	LT 3. -01	ug/g	SDM002
			1,2-Dichloroethane	LT 3. -01	ug/g	SDM002
			m-Xylene	LT 7. -01	ug/g	SDM002
			Aldrin	LT 3. -01	ug/g	SDP003
			Arsenic	LT 2.5 +00	ug/g	SDC013
			Atrazine	LT 3. -01	ug/g	SDP003
			Bicycloheptadiene	LT 3. -01	ug/g	SDM002
			Benzene	LT 3. -01	ug/g	SDM002
			Carbon Tetrachloride	LT 3. -01	ug/g	SDM002
			Cadmium	LT 7.4 -01	ug/g	BCX017
			Methylene Chloride	LT 7. -01	ug/g	SDM002
			Chloroform	LT 3. -01	ug/g	SDM002
			Hexachlorocyclopentadiene	LT 3. -01	ug/g	SDP003
			Chlorobenzene	LT 3. -01	ug/g	SDM002
			Chlordane	LT 6. -01	ug/g	SDP003
			p-Chlorophenylmethyl Sulfide	LT 4. +00	ug/g	SDP003
			p-Chlorophenylmethyl Sulfoxide	LT 7. +00	ug/g	SDP003

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0011	4-5	Soil	p-Chlorophenylmethyl Sulfone	LT 6. -01	ug/g	BDP003
			Chromium	2.3 +01	ug/g	BCX017
			Copper	1.6 +01	ug/g	BCX017
			Dibromochloropropane	LT 4. -01	ug/g	BDM002
			Dibromochloropropane	LT 3. -01	ug/g	BDP003
			Dibromochloropropane	LT 5.0 -03	ug/g	BD0006
			Dicyclopentadiene	LT 3. -01	ug/g	BDM002
			Dicyclopentadiene	LT 4. -01	ug/g	BDP003
			Vapors	LT 3. -01	ug/g	BDP003
			Diisopropylmethyl Phosphonate	LT 3. -01	ug/g	BDP003
			Dithiane	LT 7. +00	ug/g	BDP003
			Dieldrin	LT 3. -01	ug/g	BDP003
			Dimethyldisulfide	LT 8. -01	ug/g	BDM002
			Endrin	LT 3. -01	ug/g	BDP003
			Ethylbenzene	LT 3. -01	ug/g	BDM002
			Mercury	LT 5.0 -02	ug/g	BCY017
			Hydrazine	LT 5. +01	ug/g	BDT006
			Isodrin	LT 3. -01	ug/g	BDP003
			Toluene	LT 3. -01	ug/g	BDM002
			Methylhydrazine	LT 2. +02	ug/g	BD0006
			Methylisobutyl Ketone	LT 3. -01	ug/g	BDM002
			Malathion	LT 3. -01	ug/g	BDP003
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BDU006
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BDU006
			1,4-Oxathiane	LT 6. +00	ug/g	BDP003
			Lead	1.4 +01	ug/g	BCX017
			Dichlorodiphenylethane	LT 3. -01	ug/g	BDP003
			Dichlorodiphenyltrichloroethane	LT 6. -01	ug/g	BDP003
			Parathion	LT 4. -01	ug/g	BDP003
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 3. -01	ug/g	BDP003
			Tetrachloroethene	LT 3. -01	ug/g	BDM002
			Trichloroethene	LT 3. -01	ug/g	BDM002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0011	4-5	Soil	Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	SDR006
			Ortho- & Para-Xylene	LT 3. -01	ug/g	SDM002
			Zinc	6.2 +01	ug/g	BCX017
0011	9-10	Soil	1,1,1-Trichloroethane	LT 3. -01	ug/g	SDM003
			1,1,2-Trichloroethane	LT 3. -01	ug/g	SDM003
			1,1-Dichloroethane	LT 9. -01	ug/g	SDM003
			1,2-Dichloroethane	LT 3. -01	ug/g	SDM003
			1,2-Dichloroethane	LT 3. -01	ug/g	SDM003
			m-Xylene	LT 7. -01	ug/g	SDM003
			Aldrin	LT 3. -01	ug/g	SDP004
			Arsenic	LT 2.5 +00	ug/g	SDC014
			Atrazine	LT 3. -01	ug/g	SDP004
			Bicycloheptadiene	LT 3. -01	ug/g	SDM003
			Benzene	LT 3. -01	ug/g	SDM003
			Carbon Tetrachloride	LT 3. -01	ug/g	SDM003
			Cadmium	LT 7.4 -01	ug/g	SCX018
			Methylene Chloride	LT 7. -01	ug/g	SDM003
			Chloroform	LT 3. -01	ug/g	SDM003
			Hexachlorocyclopentadiene	LT 3. -01	ug/g	SDP004
			Chlorobenzene	LT 3. -01	ug/g	SDM003
			Chlordane	LT 6. -01	ug/g	SDP003
			p-Chlorophenylmethyl Sulfide	LT 4. +00	ug/g	SDP004
			p-Chlorophenylmethyl Sulfoxide	LT 7. +00	ug/g	SDP004
			p-Chlorophenylmethyl Sulfone	LT 6. -01	ug/g	SDP004
			Chromium	1.4 +01	ug/g	SCX018
			Copper	1.3 +01	ug/g	SCX018
			Dibromochloropropane	LT 4. -01	ug/g	SDM003
			Dibromochloropropane	LT 3. -01	ug/g	SDP004
			Dibromochloropropane	LT 5.0 -03	ug/g	BD0007
			Dicyclopentadiene	LT 3. -01	ug/g	SDM003
			Dicyclopentadiene	LT 4. -01	ug/g	SDP004
			Vapona	LT 3. -01	ug/g	SDP004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0011	9-10	Soil	Diisopropylmethyl Phosphonate	LT 3. -01	ug/g	BDP004
			Dithiane	LT 7. +00	ug/g	BDP004
			Dieldrin	LT 3. -01	ug/g	BDP004
			Dimethyldisulfide	LT 8. -01	ug/g	BDM003
			Endrin	LT 3. -01	ug/g	BDP004
			Ethylbenzene	LT 3. -01	ug/g	BDM003
			Mercury	LT 5.0 -02	ug/g	BCVD18
			Hydrazine	LT 5. +01	ug/g	BDT007
			Isodrin	LT 3. -01	ug/g	BDP004
			Toluene	LT 3. -01	ug/g	BDM003
			Methylhydrazine	LT 2. +02	ug/g	BDSD07
			Methylisobutyl Ketone	LT 3. -01	ug/g	BDM003
			Malethion	LT 3. -01	ug/g	BDP004
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BDU007
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BDU007
			1,4-Oxathiane	LT 6. +00	ug/g	BDP004
			Lead	LT 8.4 +00	ug/g	BCX018
			Dichlorodiphenylethane	LT 3. -01	ug/g	BDP004
			Dichlorodiphenyltrichloroethane	LT 6. -01	ug/g	BDP004
			Parathion	LT 4. -01	ug/g	BDP004
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 3. -01	ug/g	BDP004
			Tetrachloroethene	LT 3. -01	ug/g	BDM003
			Trichloroethene	LT 3. -01	ug/g	BDM003
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BDR007
			Ortho- & Para-Xylene	LT 3. -01	ug/g	BDM003
			Zinc	7.3 +01	ug/g	BCX018
	14-15	Soil	1,1,1-Trichloroethane	LT 3. -01	ug/g	BDM004
			1,1,2-Trichloroethane	LT 3. -01	ug/g	BDM004
			1,1-Dichloroethane	LT 9. -01	ug/g	BDM004
			1,2-Dichloroethane	LT 3. -01	ug/g	BDM004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0011	14-15	Soil	1,2-Dichloroethane	LT 3. -01	ug/g	SDM004
			m-Xylene	LT 7. -01	ug/g	SDM004
			Aldrin	LT 3. -01	ug/g	SDP005
			Arsenic	LT 2.5 +00	ug/g	SDC015
			Atrazine	LT 3. -01	ug/g	SDP005
			Bicycloheptadiene	LT 3. -01	ug/g	SDM004
			Benzene	LT 3. -01	ug/g	SDM004
			Carbon Tetrachloride	LT 3. -01	ug/g	SDM004
			Cadmium	LT 7.4 -01	ug/g	BCX019
			Methylene Chloride	LT 7. -01	ug/g	SDM004
			Chloroform	LT 3. -01	ug/g	SDM004
			Hexachlorocyclopentadiene	LT 3. -01	ug/g	SDP005
			Chlorobenzene	LT 3. -01	ug/g	SDM004
			Chlordane	LT 6. -01	ug/g	SDP005
			p-Chlorophenylmethyl Sulfide	LT 4. +00	ug/g	SDP005
			p-Chlorophenylmethyl Sulfoxide	LT 7. +00	ug/g	SDP005
			p-Chlorophenylmethyl Sulfone	LT 6. -01	ug/g	SDP005
			Chromium	1.0 +01	ug/g	BCX019
			Copper	4.4 +01	ug/g	BCX019
			Dibromochloropropane	LT 4. -01	ug/g	SDM004
			Dibromochloropropane	LT 3. -01	ug/g	SDP005
			Dibromochloropropane	LT 5.0 -03	ug/g	BDG008
			Dicyclopentadiene	LT 3. -01	ug/g	SDM004
			Dicyclopentadiene	LT 4. -01	ug/g	SDP005
			Vapona	LT 3. -01	ug/g	SDP005
			Diisopropylmethyl Phosphonate	LT 3. -01	ug/g	SDP005
			Dithiane	LT 7. +00	ug/g	SDP005
			Dieldrin	LT 3. -01	ug/g	SDP005
			Dimethyldisulfide	LT 8. -01	ug/g	SDM004
			Endrin	LT 3. -01	ug/g	SDP005
			Ethylbenzene	LT 3. -01	ug/g	SDM004
			Mercury	LT 5.0 -02	ug/g	BCY019
			Hydrazine	LT 5. +01	ug/g	BDT008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0011	14-15	Soil	Isodrin	LT 3. -01	ug/g	BDP005
			Toluene	LT 3. -01	ug/g	BDM004
			Methylhydrazine	LT 2. +02	ug/g	BDS008
			Methylisobutyl Ketone	LT 3. -01	ug/g	BDM004
			Malathion	LT 3. -01	ug/g	BDP005
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BDU008
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BDU008
			1,4-Oxathiane	LT 6. +00	ug/g	BDP005
			Lead	LT 6.4 +00	ug/g	BCX019
			Dichlorodiphenylethane	LT 3. -01	ug/g	BDP005
			Dichlorodiphenyltrichloroethane	LT 6. -01	ug/g	BDP005
			Parathion	LT 4. -01	ug/g	BDP005
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 3. -01	ug/g	BDP005
			Tetrachloroethene	LT 3. -01	ug/g	BDM004
			Trichloroethene	LT 3. -01	ug/g	BDM004
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BDP008
			Ortho- & Para-Xylene	LT 3. -01	ug/g	BDM004
			Zinc	1.2 +02	ug/g	BCX019
			1,1,1-Trichloroethane	LT 3. -01	ug/g	BDM005
			1,1,2-Trichloroethane	LT 3. -01	ug/g	BDM005
0011	19-20	Soil	1,1-Dichloroethane	LT 9. -01	ug/g	BDM005
			1,2-Dichloroethane	LT 3. -01	ug/g	BDM005
			1,2-Dichloroethane	LT 3. -01	ug/g	BDM005
			m-Xylene	LT 7. -01	ug/g	BDM005
			Aldrin	LT 3. -01	ug/g	BDP006
			Arsenic	LT 2.5 +00	ug/g	BDC016
			Atrazine	LT 3. -01	ug/g	BDP006
			Bicycloheptadiene	LT 3. -01	ug/g	BDM005
			Benzene	LT 3. -01	ug/g	BDM005
			Carbon Tetrachloride	LT 3. -01	ug/g	BDM005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0011	19-20	Soil	Cadmium Methylene Chloride Chloroform	LT 7.4 -01	ug/g	BCX020
				LT 7. -01	ug/g	SDM005
				LT 3. -01	ug/g	SDM005
			Hexachlorocyclopentadiene Chlorobenzene	LT 3. -01	ug/g	SDP006
				LT 3. -01	ug/g	SDM005
				LT 6. -01	ug/g	SDP006
			p-Chlorophenylmethyl Sulfide p-Chlorophenylmethyl Sulfoxide	LT 4. +00	ug/g	SDP006
				LT 7. +00	ug/g	SDP006
				LT 7. -01	ug/g	SDP006
			p-Chlorophenylmethyl Sulfone Chromium	LT 6. -01	ug/g	SDP006
				1.2 +01	ug/g	BCX020
				4.4 +01	ug/g	BCX020
			Copper Dibromochloropropane Dibromochloropropane	LT 4. -01	ug/g	SDM005
				LT 3. -01	ug/g	SDP006
				LT 3. -01	ug/g	SDP006
			Dibromochloropropane Dicyclopentadiene Dicyclopentadiene	LT 5.0 -03	ug/g	SD0009
				LT 3. -01	ug/g	SDM005
				LT 4. -01	ug/g	SDP006
			Vapona Diisopropylmethyl Phosphonate	LT 3. -01	ug/g	SDP006
				LT 3. -01	ug/g	SDP006
				LT 3. -01	ug/g	SDP006
			Dithiane Dieldrin Dimethyldisulfide	LT 7. +00	ug/g	SDP006
				LT 3. -01	ug/g	SDP006
				LT 8. -01	ug/g	SDM005
			Endrin Ethylbenzene	LT 3. -01	ug/g	SDP006
				LT 3. -01	ug/g	SDM005
				LT 3. -01	ug/g	SDM005
			Mercury Hydrazine Isodrin	LT 5.0 -02	ug/g	BCY020
				LT 5. +01	ug/g	SDT009
				LT 3. -01	ug/g	SDP006
			Toluene Methylhydrazine	LT 3. -01	ug/g	SDM005
				LT 2. +02	ug/g	SDS009
				LT 2. +02	ug/g	SDS009
			Methylisobutyl Ketone Malathion N-Nitrosodimethylamine	LT 3. -01	ug/g	SDM005
				LT 3. -01	ug/g	SDP006
				LT 2.6 -01	ug/g	SDU009
			N-Nitrosodi-N-Propylamine 1,4-Oxathiane	LT 1.0 -01	ug/g	SDU009
				LT 6. +00	ug/g	SDP006

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0011	19-20	Soil	Lead	LT 8.4 +00	ug/g	BCX020
			Dichlorodiphenylethane	LT 3. -01	ug/g	BDP006
			Dichlorodiphenyltrichloroethane	LT 6. -01	ug/g	BDP006
			Parathion	LT 4. -01	ug/g	BDP006
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 3. -01	ug/g	BDP006
			Tetrachloroethene	LT 3. -01	ug/g	BDH005
			Trichloroethene	LT 3. -01	ug/g	BDH005
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BDH009
			Ortho- & Para-Xylene	LT 3. -01	ug/g	BDH005
			Zinc	1.1 +02	ug/g	BCX020
0012	0-1	Soil	Aldrin	LT 3. -01	ug/g	BED006
			Arsenic	LT 2.5 +00	ug/g	BD0021
			Atrazine	LT 3. -01	ug/g	BED006
			Cadmium	LT 7.4 -01	ug/g	BEK009
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BED006
			Chlordane	LT 2. +00	ug/g	BED0006
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BED0006
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BED0006
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BED0006
			Chromium	9.9 +00	ug/g	BEK009
			Copper	1.7 +01	ug/g	BEK009
			Dibromochloropropane	LT 5.0 -03	ug/g	BEC009
			Dibromochloropropane	LT 3. -01	ug/g	BED0006
			Dicyclopentadiene	LT 1. +00	ug/g	BED0006
			Vapone	LT 3. +00	ug/g	BED0006
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BED0006
			Dithiane	LT 4. -01	ug/g	BED0006
			Dieldrin	LT 3. -01	ug/g	BED0006
			Endrin	LT 5. -01	ug/g	BED0006
			Mercury	9.2 -02	ug/g	BE0005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0012	0-1	Soil	Hydrazine	LT 5. +01	ug/g	BOY009
			Isodrin	LT 3. -01	ug/g	BED006
			Methylhydrazine	LT 2. +02	ug/g	BDZ009
			Malathion	LT 7. -01	ug/g	BED006
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BES009
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BES009
			1,4-Oxethane	LT 3. -01	ug/g	BED006
			Lead	2.2 +01	ug/g	BEK009
			Dichlorodiphenylethane	LT 6. -01	ug/g	BED006
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BED006
			Parathion	LT 9. -01	ug/g	BED006
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BED006
0012	4-5	Soil	Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BEA009
			Zinc	7.6 +01	ug/g	BEK009
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BEG005
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BEG005
			1,1-Dichloroethane	LT 2. +00	ug/g	BEG005
			1,2-Dichloroethane	LT 2. +00	ug/g	BEG005
			1,2-Dichloroethane	LT 6. -01	ug/g	BEG005
			m-Xylene	LT 8. -01	ug/g	BEG005
			Aldrin	LT 3. -01	ug/g	BED007
			Arsenic	1.2 +01	ug/g	BDC022
			Atrazine	LT 3. -01	ug/g	BED007
			Bicycloheptadiene	LT 4. -01	ug/g	BEG005
			Benzene	LT 3. -01	ug/g	BEG005
			Carbon Tetrachloride	LT 3. -01	ug/g	BEG005
			Cadmium	LT 7.4 -01	ug/g	BEK010
			Methylene Chloride	LT 2. +00	ug/g	BEG005
			Chloroform	LT 3. -01	ug/g	BEG005
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BED007
			Chlorobenzene	LT 1. +00	ug/g	BEG005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0012	4-5	Soil	Chlordane	LT 2. +00	ug/g	BE0007
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BE0007
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BE0007
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BE0007
			Chromium	1.5 +01	ug/g	BEK010
			Copper	2.5 +01	ug/g	BEK010
			Dibromochloropropane	LT 5.0 -03	ug/g	SEC010
			Dibromochloropropane	LT 3. -01	ug/g	BE0007
			Dibromochloropropane	LT 2. +00	ug/g	BE0005
			Dicyclopentadiene	LT 1. +00	ug/g	BE0007
			Dicyclopentadiene	LT 7. -01	ug/g	BE0005
			Vapors	LT 3. +00	ug/g	BE0007
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BE0007
			Dithiane	LT 4. -01	ug/g	BE0007
			Dieldrin	LT 3. -01	ug/g	BE0007
			Dimethyldisulfide	LT 2. +01	ug/g	BE0005
			Endrin	LT 5. -01	ug/g	BE0007
			Ethylbenzene	LT 4. -01	ug/g	BE0005
			Mercury	LT 5.0 -02	ug/g	BE0006
			Hydrazine	LT 5. +01	ug/g	BOY010
			Isodrin	LT 3. -01	ug/g	BE0007
			Toluene	LT 3. -01	ug/g	BE0005
			Methylhydrazine	LT 2. +02	ug/g	BOZ010
			Methylisobutyl Ketone	LT 7. -01	ug/g	BE0005
			Malathion	LT 7. -01	ug/g	BE0007
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BE0010
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BE0010
			1,4-Oxathiane	LT 3. -01	ug/g	BE0007
			Lead	2.3 +01	ug/g	BEK010
			Dichlorodiphenylethane	LT 6. -01	ug/g	BE0007
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BE0007
			Parathion	LT 9. -01	ug/g	BE0007
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BE0007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0012	4-5	Soil	Tetrachloroethene	LT 3. -01	ug/g	BEG005
			Trichloroethene	LT 5. -01	ug/g	BEG005
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BEA010
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BEG005
			Zinc	1.3 +02	ug/g	BEK010
0012	7.5-8.5	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BEG006
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BEG006
			1,1-Dichloroethane	LT 2. +00	ug/g	BEG006
			1,2-Dichloroethane	LT 2. +00	ug/g	BEG006
			1,2-Dichloroethane	LT 6. -01	ug/g	BEG006
			m-Xylene	LT 8. -01	ug/g	BEG006
			Aldrin	LT 3. -01	ug/g	BED008
			Arsenic	LT 2.5 +00	ug/g	BDC023
			Atrazine	LT 3. -01	ug/g	BED008
			Bicycloheptadiene	LT 4. -01	ug/g	BEG006
			Benzene	LT 3. -01	ug/g	BEG006
			Carbon Tetrachloride	LT 3. -01	ug/g	BEG006
			Cadmium	LT 7.4 -01	ug/g	BEK011
			Methylene Chloride	LT 2. +00	ug/g	BEG006
			Chloroform	LT 3. -01	ug/g	BEG006
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BED008
			Chlorobenzene	LT 1. +00	ug/g	BEG006
			Chlordane	LT 2. +00	ug/g	BED008
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BED008
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BED008
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BED008
			Chromium	LT 6.5 +00	ug/g	BEK011
			Copper	3.1 +01	ug/g	BEK011
			Dibromochloropropane	LT 5.0 -03	ug/g	BEK011
			Dibromochloropropane	LT 3. -01	ug/g	BED008
			Dibromochloropropane	LT 2. +00	ug/g	BEG006
			Dicyclopentadiene	LT 1. +00	ug/g	BED008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0012	7.5-8.5	Soil	Dicyclopentadiene	LT 7. -01	ug/g	BEG006
			Vapona	LT 3. +00	ug/g	BEG008
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEG008
			Dithiane	LT 4. -01	ug/g	BEG008
			Dieldrin	LT 3. -01	ug/g	BEG008
			Dimethyldisulfide	LT 2. +01	ug/g	BEG006
			Endrin	LT 5. -01	ug/g	BEG008
			Ethylbenzene	LT 4. -01	ug/g	BEG006
			Mercury	LT 5.0 -02	ug/g	BEG007
			Hydrazine	LT 5. +01	ug/g	BDY011
			Isodrin	LT 3. -01	ug/g	BEG008
			Toluene	LT 3. -01	ug/g	BEG006
			Methylhydrazine	LT 2. +02	ug/g	BDZ011
			Methylisobutyl Ketone	LT 7. -01	ug/g	BEG006
			Malathion	LT 7. -01	ug/g	BEG008
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEG011
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEG011
			1,4-Oxathiane	LT 3. -01	ug/g	BEG008
			Lead	LT 8.4 +00	ug/g	BEK011
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEG008
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEG008
			Parathion	LT 9. -01	ug/g	BEG008
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BEG008
			Tetrachloroethene	LT 3. -01	ug/g	BEG006
			Trichloroethene	LT 5. -01	ug/g	BEG006
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BEA011
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BEG006
			Zinc	1.0 +02	ug/g	BEK011
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BEG007
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BEG007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0012	9-10	Soil	1,1-Dichloroethane	LT 2. +00	ug/g	BEG007
			1,2-Dichloroethane	LT 2. +00	ug/g	BEG007
			1,2-Dichloroethane	LT 6. -01	ug/g	BEG007
			m-Xylene	LT 8. -01	ug/g	BEG007
			Aldrin	LT 3. -01	ug/g	BEG007
			Arsenic	LT 2.5 +00	ug/g	BEG007
			Atrazine	LT 3. -01	ug/g	BEG007
			Bicycloheptadiene	LT 4. -01	ug/g	BEG007
			Benzene	LT 3. -01	ug/g	BEG007
			Carbon Tetrachloride	LT 3. -01	ug/g	BEG007
			Cadmium	LT 7.4 -01	ug/g	BEG007
			Methylene Chloride	LT 2. +00	ug/g	BEG007
			Chloroform	LT 3. -01	ug/g	BEG007
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEG007
			Chlorobenzene	LT 1. +00	ug/g	BEG007
			Chlordane	LT 2. +00	ug/g	BEG007
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEG007
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEG007
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEG007
			Chromium	LT 6.5 +00	ug/g	BEG007
			Copper	LT 3.9 +01	ug/g	BEG007
			Dibromochloropropane	LT 5.0 -03	ug/g	BEG007
			Dibromochloropropane	LT 3. -01	ug/g	BEG007
			Dibromochloropropane	LT 2. +00	ug/g	BEG007
			Dicyclopentadiene	LT 1. +00	ug/g	BEG007
			Dicyclopentadiene	LT 7. -01	ug/g	BEG007
			Vapona	LT 3. +00	ug/g	BEG007
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEG007
			Dithiane	LT 4. -01	ug/g	BEG007
			Dieldrin	LT 3. -01	ug/g	BEG007
			Dimethyldisulfide	LT 2. +01	ug/g	BEG007
			Endrin	LT 5. -01	ug/g	BEG007
			Ethylbenzene	LT 4. -01	ug/g	BEG007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Summary of Analytical Results

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0012	9-10	Soil	Mercury	LT 5.0 -02	ug/g	BEG008
			Hydrazine	LT 5. +01	ug/g	BEG012
			Isodrin	LT 3. -01	ug/g	BEG009
			Toluene	LT 3. -01	ug/g	BEG007
			Methylhydrazine	LT 2. +02	ug/g	BEG012
			Methylisobutyl Ketone	LT 7. -01	ug/g	BEG007
			Malathion	LT 7. -01	ug/g	BEG009
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEG012
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEG012
			1,4-Oxathiane	LT 3. -01	ug/g	BEG009
			Lead	1.6 +01	ug/g	BEG012
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEG009
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEG009
			Parathion	LT 9. -01	ug/g	BEG009
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BEG009
			Tetrachloroethene	LT 3. -01	ug/g	BEG007
			Trichloroethene	LT 5. -01	ug/g	BEG007
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BEG012
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BEG007
			Zinc	1.1 +02	ug/g	BEG012
0013	0-1	Soil	Aldrin	LT 3. -01	ug/g	BEG002
			Arsenic	LT 2.5 +00	ug/g	BEG017
			Atrazine	LT 3. -01	ug/g	BEG002
			Cadmium	LT 7.4 -01	ug/g	BEG005
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEG002
			Chlordane	LT 2. +00	ug/g	BEG002
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEG002
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEG002
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEG002
			Chromium	1.0 +01	ug/g	BEG005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0013	0-1	Soil	Copper	1.2 +01	ug/g	BEK005
			Dibromochloropropane	LT 5.0 -03	ug/g	BEK005
			Dibromochloropropane	LT 3. -01	ug/g	BEK002
			Dicyclopentadiene	LT 1. +00	ug/g	BEK002
			Vapona	LT 3. +00	ug/g	BEK002
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEK002
			Dithiene	LT 4. -01	ug/g	BEK002
			Dieldrin	LT 3. -01	ug/g	BEK002
			Endrin	LT 5. -01	ug/g	BEK002
			Mercury	LT 5.0 -02	ug/g	BEK010
			Hydrazine	LT 5. +01	ug/g	BDY005
			Isodrin	LT 3. -01	ug/g	BEK002
			Methylhydrazine	LT 2. +02	ug/g	BDZ005
			Malathion	LT 7. -01	ug/g	BEK002
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEK005
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEK005
			1,4-Oxathiane	LT 3. -01	ug/g	BEK002
			Lead	1.9 +01	ug/g	BEK005
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEK002
			Dichlorodiphenyltrichloro-ethane	LT 5. -01	ug/g	BEK002
0013	4-5	Soil	Parathion	LT 9. -01	ug/g	BEK002
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BEK002
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BEA005
			Zinc	4.9 +01	ug/g	BEK005
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BEK002
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BEK002
			1,1-Dichloroethane	LT 2. +00	ug/g	BEK002
			1,2-Dichloroethane	LT 2. +00	ug/g	BEK002
			1,2-Dichloroethane	LT 6. -01	ug/g	BEK002
			m-Xylene	LT 8. -01	ug/g	BEK002
			Aldrin	LT 3. -01	ug/g	BEK003

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0013	4-5	Soil	Arsenic	LT 2.5	+00	SDC018
			Atrazine	LT 3.	-01	BED003
			Bicycloheptadiene	LT 4.	-01	BEG002
			Benzene	LT 3.	-01	BEG002
			Carbon Tetrachloride	LT 3.	-01	BEG002
			Cadmium	LT 7.4	-01	BEK006
			Methylene Chloride	LT 2.	+00	BEG002
			Chloroform	LT 3.	-01	BEG002
			Hexachlorocyclopentadiene	LT 6.	-01	BED003
			Chlorobenzene	LT 1.	+00	BEG002
			Chloroform	LT 2.	+00	BED003
			p-Chlorophenylmethyl Sulfide	LT 9.	-01	BED003
			p-Chlorophenylmethyl Sulfoxide	LT 3.	-01	BED003
			p-Chlorophenylmethyl Sulfone	LT 3.	-01	BED003
			Chromium	1.4	+01	BEK006
			Copper	1.6	+01	BEK006
			Dibromochloropropane	LT 5.0	-03	BEK006
			Dibromochloropropane	LT 3.	-01	BED003
			Dibromochloropropane	LT 2.	+00	BEG002
			Dicyclopentadiene	LT 1.	+00	BED003
			Dicyclopentadiene	LT 7.	-01	BEG002
			Vapors	LT 3.	+00	BED003
			Diisopropylmethyl Phosphonate	LT 1.	+00	BED003
			Dithiane	LT 4.	-01	BED003
			Dieldrin	LT 3.	-01	BED003
			Dimethyldisulfide	LT 2.	+01	BEG002
			Endrin	LT 5.	-01	BED003
			Ethylbenzene	LT 4.	-01	BEG002
			Mercury	LT 5.0	-02	BE0011
			Hydrazine	LT 5.	+01	SDY006
			Isodrin	LT 3.	-01	BED003
			Toluene	LT 3.	-01	BEG002
			Methylhydrazine	LT 2.	+02	SDZ006

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0013	4-5	Soil	Methylisobutyl Ketone	LT 7. -01	ug/g	BEG002
			Malathion	LT 7. -01	ug/g	BEG003
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEG006
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEG006
			1,4-Oxathiane	LT 3. -01	ug/g	BEG003
			Lead	1.9 +01	ug/g	BEK006
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEG003
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEG003
			Parathion	LT 9. -01	ug/g	BEG003
			2-Chloro-1(2,4-Dichlorophenyl) Vinyllethyl Phosphates	LT 6. -01	ug/g	BEG003
			Tetrachloroethene	LT 3. -01	ug/g	BEG002
			Trichloroethene	LT 5. -01	ug/g	BEG002
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BEA006
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BEG002
			Zinc	7.3 +01	ug/g	BEK006
0013	9-10	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BEG003
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BEG003
			1,1-Dichloroethane	LT 2. +00	ug/g	BEG003
			1,2-Dichloroethane	LT 2. +00	ug/g	BEG003
			1,2-Dichloroethane	LT 6. -01	ug/g	BEG003
			m-Xylene	LT 8. -01	ug/g	BEG003
			Aldrin	LT 3. -01	ug/g	BEG004
			Arsenic	LT 2.5 +00	ug/g	BEG019
			Atrazine	LT 3. -01	ug/g	BEG004
			Bicycloheptadiene	LT 4. -01	ug/g	BEG003
			Benzene	LT 3. -01	ug/g	BEG003
			Carbon Tetrachloride	LT 3. -01	ug/g	BEG003
			Cadmium	LT 7.4 -01	ug/g	BEK007
			Methylene Chloride	LT 2. +00	ug/g	BEG003
			Chloroform	LT 3. -01	ug/g	BEG003

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0013	9-10	Soil	Hexachlorocyclopentadiene	LT 6. -01	ug/g	BED004
			Chlorobenzene	LT 1. +00	ug/g	BEG003
			Chlordane	LT 2. +00	ug/g	BED004
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BED004
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BED004
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BED004
			Chromium	LT 6.5 +00	ug/g	BEK007
			Copper	LT 4.4 +01	ug/g	BEK007
			Dibromochloropropane	LT 5.0 -03	ug/g	BEK007
			Dibromochloropropane	LT 3. -01	ug/g	BED004
			Dibromochloropropane	LT 2. +00	ug/g	BEG003
			Dicyclopentadiene	LT 1. +00	ug/g	BED004
			Dicyclopentadiene	LT 7. -01	ug/g	BEG003
			Vapona	LT 3. +00	ug/g	BED004
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BED004
			Dithiane	LT 4. -01	ug/g	BED004
			Dieldrin	LT 3. -01	ug/g	BED004
			Dimethyldisulfide	LT 2. +01	ug/g	BEG003
			Endrin	LT 5. -01	ug/g	BED004
			Ethylbenzene	LT 4. -01	ug/g	BEG003
			Mercury	LT 5.0 -02	ug/g	BED0012
			Hydrazine	LT 5. +01	ug/g	BDY007
			Isodrin	LT 3. -01	ug/g	BED004
			Toluene	LT 3. -01	ug/g	BEG003
			Methylhydrazine	LT 2. +02	ug/g	BDZ007
			Methylisobutyl Ketone	LT 7. -01	ug/g	BEG003
			Malathion	LT 7. -01	ug/g	BED004
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEG007
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEG007
			1,4-Oxathiane	LT 3. -01	ug/g	BED004
			Lead	1.4 +01	ug/g	BEK007
			Dichlorodiphenylethane	LT 6. -01	ug/g	BED004
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BED004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0013	9-10	Soil	Parathion	LT 9.	-01	BEG004
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6.	-01	BEG004
			Tetrachloroethene	LT 3.	-01	BEG003
			Trichloroethene	LT 5.	-01	BEG003
			Unsymmetrical Dimethyl Hydrazine	LT 2.	+02	BEA007
			Ortho- & Para-Xylene	LT 5.	+00	BEG003
			Zinc	9.3	+01	BEK007
			1,1,1-Trichloroethane	LT 4.	-01	BEG004
			1,1,2-Trichloroethane	LT 4.	-01	BEG004
			1,1-Dichloroethane	LT 2.	+00	BEG004
0013	13-14	Soil	1,2-Dichloroethane	LT 2.	+00	BEG004
			1,2-Dichloroethane	LT 6.	-01	BEG004
			m-Xylene	LT 8.	-01	BEG004
			Aldrin	LT 3.	-01	BEG005
			Arsenic	LT 2.5	+00	BDC020
			Atrazine	LT 3.	-01	BEG005
			Bicycloheptadiene	LT 4.	-01	BEG004
			Benzene	LT 3.	-01	BEG004
			Carbon Tetrachloride	LT 3.	-01	BEG004
			Cadmium	LT 7.4	-01	BEK008
			Methylene Chloride	LT 2.	+00	BEG004
			Chloroform	LT 3.	-01	BEG004
			Hexachlorocyclopentadiene	LT 6.	-01	BEG005
			Chlorobenzene	LT 1.	+00	BEG004
			Chlordane	LT 2.	+00	BEG005
			p-Chlorophenylmethyl Sulfide	LT 9.	-01	BEG005
			p-Chlorophenylmethyl Sulfoxide	LT 3.	-01	BEG005
			p-Chlorophenylmethyl Sulfone	LT 3.	-01	BEG005
			Chromium	LT 6.5	+00	BEK008
			Copper	4.8	+01	BEK008
			Dibromochloropropane	LT 5.0	-03	BEC008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0013	13-14	Soil	Dibromochloropropane	LT 3. -01	ug/g	BED005
			Dibromochloropropane	LT 2. +00	ug/g	BEG004
			Dibromochloropropane	LT 1. +00	ug/g	BED005
			Dicyclopentadiene	LT 7. -01	ug/g	BEG004
			Dicyclopentadiene	LT 3. +00	ug/g	BED005
			Vapona	LT 1. +00	ug/g	BED005
			Diisopropylmethyl Phosphonate			
			Dithiane	LT 4. -01	ug/g	BED005
			Dieldrin	LT 3. -01	ug/g	BED005
			Dimethyldisulfide	LT 2. +01	ug/g	BEG004
			Endrin	LT 5. -01	ug/g	BED005
			Ethylbenzene	LT 4. -01	ug/g	BEG004
			Mercury	LT 5.0 -02	ug/g	BED013
			Hydrazine	LT 5. +01	ug/g	BOY008
			Isodrin	LT 3. -01	ug/g	BED005
			Toluene	LT 3. -01	ug/g	BEG004
			Methylhydrazine	LT 2. +02	ug/g	BDZ008
			Methylisobutyl Ketone			
			Malethion	LT 7. -01	ug/g	BEG004
			N-Nitrosodimethylamine	LT 7. -01	ug/g	BED005
			N-Nitrosodi-N-Propylamine	LT 2.6 -01	ug/g	BEG008
			1,4-Oxathiane	LT 1.0 -01	ug/g	BEG008
				LT 3. -01	ug/g	BED005
			Lead	1.8 +01	ug/g	BEK008
			Dichlorodiphenylethane	LT 6. -01	ug/g	BED005
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BED005
			Parathion			
			2-Chloro-1(2,4-Dichlorophenyl)	LT 9. -01	ug/g	BED005
			Vinylidethyl Phosphates	LT 6. -01	ug/g	BED005
			Tetrachloroethene			
			Trichloroethene	LT 3. -01	ug/g	BEG004
			Unsymmetrical Dimethyl	LT 5. -01	ug/g	BEG004
			Hydrazine	LT 2. +02	ug/g	BEA008
			Ortho- & Para-Xylene			
			Zinc	LT 5. +00	ug/g	BEG004
				1.1 +02	ug/g	BEK008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	0-1	Soil	Aldrin	LT 3. -01	ug/g	BEU008
			Arsenic	LT 2.5 +00	ug/g	BFH009
			Atrazine	LT 3. -01	ug/g	BEU008
			Cadmium	LT 7.4 -01	ug/g	BEK017
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEU008
			Chlordane	LT 2. +00	ug/g	BEU008
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEU008
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEU008
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEU008
			Chromium	LT 1.1 +01	ug/g	BEK017
			Copper	LT 1.4 +01	ug/g	BEK017
			Dibromochloropropane	LT 5.0 -03	ug/g	BEK011
			Dibromochloropropane	LT 3. -01	ug/g	BEU008
			Dicyclopentadiene	LT 1. +00	ug/g	BEU008
			Vapona	LT 3. +00	ug/g	BEU008
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU008
			Dithiane	LT 4. -01	ug/g	BEU008
			Dieldrin	LT 3. -01	ug/g	BEU008
			Endrin	LT 5. -01	ug/g	BEU008
			Mercury	LT 5.0 -02	ug/g	BEK017
			Hydrazine	LT 5. +01	ug/g	BEK011
			Isodrin	LT 3. -01	ug/g	BEU008
			Methylhydrazine	LT 2. +02	ug/g	BEK011
			Malathion	LT 7. -01	ug/g	BEU008
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEK011
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEK011
			1,4-Oxathiane	LT 3. -01	ug/g	BEU008
			Lead	LT 2.6 +01	ug/g	BEK017
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEU008
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEU008
			Parathion	LT 9. -01	ug/g	BEU008
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl-diethyl Phosphates	LT 6. -01	ug/g	BEU008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	0-1	Soil	Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BER011
			Zinc	5.8 +01	ug/g	BEK017
0014	4-5	Soil	1,1,1-Trichloroethane	LT 4. -01	ug/g	BEV006
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BEV006
			1,1-Dichloroethane	LT 2. +00	ug/g	BEV006
			1,2-Dichloroethane	LT 2. +00	ug/g	BEV006
			1,2-Dichloroethane	LT 6. -01	ug/g	BEV006
			m-Xylene	LT 8. -01	ug/g	BEV006
			Aldrin	LT 3. -01	ug/g	BEU009
			Arsenic	LT 2.5 +00	ug/g	BFH010
			Atrazine	LT 3. -01	ug/g	BEU009
			Bicycloheptadiene	LT 4. -01	ug/g	BEV006
			Benzene	LT 3. -01	ug/g	BEV006
			Carbon Tetrachloride	LT 3. -01	ug/g	BEV006
			Cadmium	LT 7.4 -01	ug/g	BEK018
			Methylene Chloride	LT 2. +00	ug/g	BEV006
			Chloroform	LT 3. -01	ug/g	BEV006
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEU009
			Chlorobenzene	LT 1. +00	ug/g	BEV006
			Chlordane	LT 2. +00	ug/g	BEU009
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEU009
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEU009
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEU009
			Chromium	LT 6.5 +00	ug/g	BEK018
			Copper	6.3 +00	ug/g	BEK018
			Dibromochloropropane	LT 5.0 -03	ug/g	BEK012
			Dibromochloropropane	LT 3. -01	ug/g	BEU009
			Dibromochloropropane	LT 2. +00	ug/g	BEV006
			Dicyclopentadiene	LT 1. +00	ug/g	BEU009
			Dicyclopentadiene	LT 7. -01	ug/g	BEV006
			Vapors	LT 3. +00	ug/g	BEU009
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU009

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	4-5	Soil	Dithiane	LT 4. -01	ug/g	BEU009
			Dieldrin	LT 3. -01	ug/g	BEU009
			Dimethyldisulfide	LT 2. +01	ug/g	BEV006
			Endrin	LT 5. -01	ug/g	BEU009
			Ethylbenzene	LT 4. -01	ug/g	BEV006
			Mercury	LT 5.0 -02	ug/g	BE0018
			Hydrazine	LT 5. +01	ug/g	BE0012
			Isodrin	LT 3. -01	ug/g	BEU009
			Toluene	LT 3. -01	ug/g	BEV006
			Methylhydrazine	LT 2. +02	ug/g	BET012
			Methylisobutyl Ketone	LT 7. -01	ug/g	BEV006
			Malathion	LT 7. -01	ug/g	BEU009
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BE0012
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BE0012
			1,4-Oxathiane	LT 3. -01	ug/g	BEU009
			Lead	1.1 +01	ug/g	BEK018
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEU009
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEU009
			Parathion	LT 9. -01	ug/g	BEU009
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BEU009
0014	9-10	Soil	Tetrachloroethene	LT 3. -01	ug/g	BEV006
			Trichloroethene	LT 5. -01	ug/g	BEV006
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BE0012
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BEV006
			Zinc	2.9 +01	ug/g	BEK018
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BEV007
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BEV007
			1,1-Dichloroethane	LT 2. +00	ug/g	BEV007
			1,2-Dichloroethane	LT 2. +00	ug/g	BEV007
			1,2-Dichloroethane	LT 6. -01	ug/g	BEV007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	9-10	Soil	m-Xylene	LT 8. -01	ug/g	BEV007
			Aldrin	LT 3. -01	ug/g	BEU010
			Arsenic	LT 2.5 +00	ug/g	BEH011
			Atrazine	LT 3. -01	ug/g	BEU010
			Bicycloheptadiene	LT 4. -01	ug/g	BEV007
			Benzene	LT 3. -01	ug/g	BEV007
			Carbon Tetrachloride	LT 3. -01	ug/g	BEV007
			Cadmium	LT 7.4 -01	ug/g	BEK019
			Methylene Chloride	LT 2. +00	ug/g	BEV007
			Chloroform	LT 3. -01	ug/g	BEV007
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEU010
			Chlorobenzene	LT 1. +00	ug/g	BEV007
			Chlordane	LT 2. +00	ug/g	BEU010
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEU010
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEU010
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEU010
			Chromium	8.1 +00	ug/g	BEK019
			Copper	5.8 +00	ug/g	BEK019
			Dibromochloropropane	LT 5.0 -03	ug/g	BEF013
			Dibromochloropropane	LT 3. -01	ug/g	BEU010
			Dibromochloropropane	LT 2. +00	ug/g	BEV007
			Dicyclopentadiene	LT 1. +00	ug/g	BEU010
			Dicyclopentadiene	LT 7. -01	ug/g	BEV007
			Vapona	LT 3. +00	ug/g	BEU010
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU010
			Dithiane	LT 4. -01	ug/g	BEU010
			Dieldrin	LT 3. -01	ug/g	BEU010
			Dimethyldisulfide	LT 2. +01	ug/g	BEV007
			Endrin	LT 5. -01	ug/g	BEU010
			Ethylbenzene	LT 4. -01	ug/g	BEV007
			Mercury	LT 5.0 -02	ug/g	BEK019
			Hydrazine	LT 5. +01	ug/g	BEK013
			Isodrin	LT 3. -01	ug/g	BEU010
			Toluene	LT 3. -01	ug/g	BEV007

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	9-10	Soil	Methylhydrazine	LT 2. +02	ug/g	BET013
			Methylisobutyl Ketone	LT 7. -01	ug/g	BEV007
			Malethion	LT 7. -01	ug/g	BEU010
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEQ013
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEQ013
			1,4-Oxathiane	LT 3. -01	ug/g	BEU010
			Lead	LT 8.4 +00	ug/g	BEK019
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEU010
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEU010
			Parathion	LT 9. -01	ug/g	BEU010
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BEU010
			Tetrachloroethene	LT 3. -01	ug/g	BEV007
			Trichloroethene	LT 5. -01	ug/g	BEV007
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BER013
0014	14-15	Soil	Ortho- & Para-Xylene	LT 5. +00	ug/g	BEV007
			Zinc	3.0 +01	ug/g	BEK019
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BFF002
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BFF002
			1,1-Dichloroethane	LT 2. +00	ug/g	BFF002
			1,2-Dichloroethane	LT 2. +00	ug/g	BFF002
			1,2-Dichloroethane	LT 6. -01	ug/g	BFF002
			m-Xylene	LT 8. -01	ug/g	BFF002
			Aldrin	LT 3. -01	ug/g	BFF002
			Arsenic	LT 2.5 +00	ug/g	BFF002
			Atrazine	LT 3. -01	ug/g	BFF002
			Bicycloheptadiene	LT 4. -01	ug/g	BFF002
			Benzene	LT 3. -01	ug/g	BFF002
			Carbon Tetrachloride	LT 3. -01	ug/g	BFF002
			Cadmium	LT 7.4 -01	ug/g	BFF002
			Methylene Chloride	LT 2. +00	ug/g	BFF002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	14-15	Soil	Chloroform	LT 3. -01	ug/g	BFF002
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BFD002
			Chlorobenzene	LT 1. +00	ug/g	BFF002
			Chlordane	LT 2. +00	ug/g	BFD002
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BFD002
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BFD002
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BFD002
			Chromium	LT 6.5 +00	ug/g	BFI007
			Copper	8.4 +00	ug/g	BFI007
			Dibromochloropropane	LT 5.0 -03	ug/g	BFC005
			Dibromochloropropane	LT 3. -01	ug/g	BFD002
			Dibromochloropropane	LT 2. +00	ug/g	BFF002
			Dicyclopentadiene	LT 1. +00	ug/g	BFD002
			Dicyclopentadiene	LT 7. -01	ug/g	BFF002
			Vapona	LT 3. +00	ug/g	BFD002
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BFD002
			Dithiane	LT 4. -01	ug/g	BFD002
			Dieldrin	LT 3. -01	ug/g	BFD002
			Dimethyldisulfide	LT 2. +01	ug/g	BFF002
			Endrin	LT 5. -01	ug/g	BFD002
			Ethylbenzene	LT 4. -01	ug/g	BFF002
			Mercury	LT 5.0 -02	ug/g	BFI007
			Hydrazine	LT 5. +01	ug/g	BFB005
			Isodrin	LT 3. -01	ug/g	BFD002
			Toluene	LT 3. -01	ug/g	BFF002
			Methylhydrazine	LT 2. +02	ug/g	BFA005
			Methylisobutyl Ketone	LT 7. -01	ug/g	BFF002
			Malathion	LT 7. -01	ug/g	BFD002
			N-Nitrosodimethylamine	LT 2.6 +00	ug/g	BEY005
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEY005
			1,4-Oxathiane	LT 3. -01	ug/g	BFD002
			Lead	LT 8.4 +00	ug/g	BFI007
			Dichlorodiphenylethane	LT 6. -01	ug/g	BFD002

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

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Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	14-15	Soil	Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BF0002
			Parathion	LT 9. -01	ug/g	BF0002
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BF0002
			Tetrachloroethene	LT 3. -01	ug/g	BF0002
			Trichloroethene	LT 5. -01	ug/g	BF0002
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BE2005
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BF0002
			Zinc	3.2 +01	ug/g	BF1007
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BF0003
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BF0003
0014	19-20	Soil	1,1-Dichloroethane	LT 2. +00	ug/g	BF0003
			1,2-Dichloroethane	LT 2. +00	ug/g	BF0003
			1,2-Dichloroethane	LT 6. -01	ug/g	BF0003
			m-Xylene	LT 8. -01	ug/g	BF0003
			Aldrin	LT 3. -01	ug/g	BF0003
			Arsenic	LT 2.5 +00	ug/g	BF0016
			Atrazine	LT 3. -01	ug/g	BF0003
			Bicycloheptadiene	LT 4. -01	ug/g	BF0003
			Benzene	LT 3. -01	ug/g	BF0003
			Carbon Tetrachloride	LT 3. -01	ug/g	BF0003
			Cadmium	LT 7.4 -01	ug/g	BF1008
			Methylene Chloride	LT 2. +00	ug/g	BF0003
			Chloroform	LT 3. -01	ug/g	BF0003
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BF0003
			Chlorobenzene	LT 1. +00	ug/g	BF0003
			Chlordane	LT 2. +00	ug/g	BF0003
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BF0003
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BF0003
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BF0003
			Chromium	LT 6.5 +00	ug/g	BF1008

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	19-20	Soil	Copper	3.9 +01	ug/g	BF1008
			Dibromochloropropane	LT 5.0 -03	ug/g	BF0006
			Dibromochloropropane	LT 3. -01	ug/g	BF0003
			Dibromochloropropane	LT 2. +00	ug/g	BF0003
			Dicyclopentadiene	LT 1. +00	ug/g	BF0003
			Dicyclopentadiene	LT 7. -01	ug/g	BF0003
			Vapona	LT 3. +00	ug/g	BF0003
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BF0003
			Dithiane	LT 4. -01	ug/g	BF0003
			Dieldrin	LT 3. -01	ug/g	BF0003
			Dimethyldisulfide	LT 2. +01	ug/g	BF0003
			Endrin	LT 5. -01	ug/g	BF0003
			Ethylbenzene	LT 4. -01	ug/g	BF0003
			Mercury	LT 5.0 -02	ug/g	BF1008
			Hydrazine	LT 5. +01	ug/g	BF0006
			Isodrin	LT 3. -01	ug/g	BF0003
			Toluene	LT 3. -01	ug/g	BF0003
			Methylhydrazine	LT 2. +02	ug/g	BF0006
			Methylisobutyl Ketone	LT 7. -01	ug/g	BF0003
			Malethion	LT 7. -01	ug/g	BF0003
			N-Nitrosodimethylamine	LT 2.6 +00	ug/g	BEY006
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEY006
			1,4-Oxathiane	LT 3. -01	ug/g	BF0003
			Lead	1.4 +01	ug/g	BF1008
			Dichlorodiphenylethane	LT 6. -01	ug/g	BF0003
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BF0003
			Parathion	LT 9. -01	ug/g	BF0003
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BF0003
			Tetrachloroethene	LT 3. -01	ug/g	BF0003
			Trichloroethene	LT 5. -01	ug/g	BF0003
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BEZ006

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
 Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	19-20	Soil	Ortho- & Para-Xylene Zinc	LT 5. +00 9.1 +01	ug/g ug/g	SFF003 SF1008
0014	24-25	Soil	1,1,1-Trichloroethane 1,1,2-Trichloroethane 1,1-Dichloroethane 1,2-Dichloroethene 1,2-Dichloroethane m-Xylene Aldrin Arsenic Atrazine Bicycloheptadiene Benzene Carbon Tetrachloride Cadmium Methylene Chloride Chloroform Hexachlorocyclopentadiene Chlorobenzene Chlordane p-Chlorophenylmethyl Sulfide p-Chlorophenylmethyl Sulfoxide p-Chlorophenylmethyl Sulfone Chromium Copper Dibromochloropropane Dibromochloropropane Dibromochloropropane Dicyclopentadiene Dicyclopentadiene Vapona Diisopropylmethyl Phosphonate	LT 4. -01 LT 4. -01 LT 2. +00 LT 2. +00 LT 6. -01 LT 8. -01 LT 3. -01 LT 2.5 +00 LT 3. -01 LT 4. -01 LT 3. -01 LT 3. -01 LT 7.4 -01 LT 2. +00 LT 3. -01 LT 6. -01 LT 1. +00 LT 2. +00 LT 9. -01 LT 3. -01 LT 3. -01 LT 6.5 +00 LT 4.1 +01 LT 5.0 -03 LT 3. -01 LT 2. +00 LT 1. +00 LT 7. -01 LT 3. +00 LT 1. +00	ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g	SFF004 SFF004 SFF004 SFF004 SFF004 SFF004 SFF004 SFF017 SFD004 SFF004 SFF004 SFF004 SFF1009 SFF004 SFF004 SFF004 SFF004 SFF1009 SFF007 SFF004 SFF004 SFF1009 SFF1009 SFC007 SFF004 SFF004 SFF004 SFF004 SFF004 SFF004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions. Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Soil Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0014	24-25	Soil	Dithiane	LT 4. -01	ug/g	BFD004
			Dieldrin	LT 3. -01	ug/g	BFD004
			Dimethyldisulphide	LT 2. +01	ug/g	BFD004
			Endrin	LT 5. -01	ug/g	BFD004
			Ethylbenzene	LT 4. -01	ug/g	BFD004
			Mercury	LT 5.0 -02	ug/g	BFD009
			Hydrazine	LT 5. +01	ug/g	BFD007
			Isodrin	LT 3. -01	ug/g	BFD004
			Toluene	LT 3. -01	ug/g	BFD004
			Methylhydrazine	LT 2. +02	ug/g	BFA007
			Methylisobutyl Ketone	LT 7. -01	ug/g	BFD004
			Malathion	LT 7. -01	ug/g	BFD004
			N-Nitrosodimethylamine	LT 2.6 +00	ug/g	BEY007
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEY007
			1,4-Oxathiane	LT 3. -01	ug/g	BFD004
			Lead	1.3 +01	ug/g	BFI009
			Dichlorodiphenylethane	LT 6. -01	ug/g	BFD004
			Dichlorodiphenyltrichloro- ethane	LT 5. -01	ug/g	BFD004
			Parathion	LT 9. -01	ug/g	BFD004
			2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BFD004
0015	0-1	Soil	Tetrachloroethene	LT 3. -01	ug/g	BFD004
			Trichloroethene	LT 5. -01	ug/g	BFD004
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BEZ007
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BFD004
			Zinc	9.4 +01	ug/g	BFI009
			Aldrin	LT 3. -01	ug/g	BEU005
			Arsenic	LT 2.5 +00	ug/g	BFA006
			Atrazine	LT 3. -01	ug/g	BEU005
			Cadmium	LT 7.4 -01	ug/g	BEK014
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEU005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0015	0-1	Soil	Chlordane	LT 2. +00	ug/g	BEU005
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEU005
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEU005
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEU005
			Chromium	LT 6.5 +00	ug/g	BEK014
			Copper	8.4 +00	ug/g	BEK014
			Dibromochloropropane	LT 5.0 -03	ug/g	BEU005
			Dibromochloropropane	LT 3. -01	ug/g	BEU005
			Dicyclopentadiene	LT 1. +00	ug/g	BEU005
			Vapona	LT 3. +00	ug/g	BEU005
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU005
			Dithiane	LT 4. -01	ug/g	BEU005
			Dieldrin	LT 3. -01	ug/g	BEU005
			Endrin	LT 5. -01	ug/g	BEU005
			Mercury	LT 5.0 -02	ug/g	BEU014
			Hydrazine	LT 5. +01	ug/g	BEU008
			Isodrin	LT 3. -01	ug/g	BEU005
			Methylhydrazine	LT 2. +02	ug/g	BEU008
			Malathion	LT 7. -01	ug/g	BEU005
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEU008
0015	4-5	Soil	N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEU008
			1,4-Oxathiane	LT 3. -01	ug/g	BEU005
			Lead	1.2 +01	ug/g	BEK014
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEU005
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEU005
			Parathion	LT 9. -01	ug/g	BEU005
			2-Chloro-1(2,4-Dichlorophenyl)	LT 6. -01	ug/g	BEU005
			Vinylidietyl Phosphates			
			Unsymmetrical Dimethyl	LT 2. +02	ug/g	BEU008
			Hydrazine			
			Zinc	3.7 +01	ug/g	BEK014
			1,1,1-Trichloroethane	LT 4. -01	ug/g	BEU004
			1,1,2-Trichloroethane	LT 4. -01	ug/g	BEU004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0015	4-5	Soil	1,1-Dichloroethane	LT 2. +00	ug/g	BEV004
			1,2-Dichloroethane	LT 2. +00	ug/g	BEV004
			1,2-Dichloroethane	LT 6. -01	ug/g	BEV004
			m-Xylene	LT 8. -01	ug/g	BEV004
			Aldrin	LT 3. -01	ug/g	BEU006
			Arsenic	LT 2.5 +00	ug/g	BFH007
			Atrazine	LT 3. -01	ug/g	BEU006
			Bicycloheptadiene	LT 4. -01	ug/g	BEV004
			Benzene	LT 3. -01	ug/g	BEV004
			Carbon Tetrachloride	LT 3. -01	ug/g	BEV004
			Cadmium	LT 7.4 -01	ug/g	BEK015
			Methylene Chloride	LT 2. +00	ug/g	BEV004
			Chloroform	LT 3. -01	ug/g	BEV004
			Hexachlorocyclopentadiene	LT 5. -01	ug/g	BEU006
			Chlorobenzene	LT 1. +00	ug/g	BEV004
			Chlordane	LT 2. +00	ug/g	BEU006
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEU006
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEU006
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEU006
			Chromium	9.3 +00	ug/g	BEK015
			Copper	9.8 +00	ug/g	BEK015
			Dibromochloropropane	LT 5.0 -03	ug/g	SEP009
			Dibromochloropropane	LT 3. -01	ug/g	BEU006
			Dibromochloropropane	LT 2. +00	ug/g	BEV004
			Dicyclopentadiene	LT 1. +00	ug/g	BEU006
			Dicyclopentadiene	LT 7. -01	ug/g	BEV004
			Vapors	LT 3. +00	ug/g	BEU006
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU006
			Dithiane	LT 4. -01	ug/g	BEU006
			Dieldrin	LT 3. -01	ug/g	BEU006
			Dimethyldisulfide	LT 2. +01	ug/g	BEV004
			Endrin	LT 5. -01	ug/g	BEU006
			Ethylbenzene	LT 4. -01	ug/g	BEV004

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Summary of Analytical Results

Task 11, Site 1-7

Hydrazine Blending and Storage Facility

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0015	4-5	Soil	Mercury	LT 5.0	-02	BE0015
			Hydrazine	LT 5.	+01	BE0009
			Isodrin	LT 3.	-01	BEU006
			Toluene	LT 3.	-01	BEV004
			Methylhydrazine	LT 2.	+02	BET009
			Methylisobutyl Ketone	LT 7.	-01	BEV004
			Malathion	LT 7.	-01	BEU006
			N-Nitrosodimethylamine	LT 2.6	-01	BE0009
			N-Nitrosodi-N-Propylamine	LT 1.0	-01	BE0009
			1,4-Oxathiane	LT 3.	-01	BEU006
			Lead	1.2	+01	BEK015
			Dichlorodiphenylethane	LT 6.	-01	BEU006
			Dichlorodiphenyltrichloroethane	LT 5.	-01	BEU006
			Parathion	LT 9.	-01	BEU006
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6.	-01	BEU006
			Tetrachloroethene	LT 3.	-01	BEV004
			Trichloroethene	LT 5.	-01	BEV004
			Unsymmetrical Dimethyl Hydrazine	LT 2.	+02	BER009
			Ortho- & Para-Xylene	LT 5.	+00	BEV004
			Zinc	4.2	+01	BEK015
0015	9-10	Soil	1,1,1-Trichloroethane	LT 4.	-01	BEV005
			1,1,2-Trichloroethane	LT 4.	-01	BEV005
			1,1-Dichloroethane	LT 2.	+00	BEV005
			1,2-Dichloroethane	LT 2.	+00	BEV005
			1,2-Dichloroethane	LT 6.	-01	BEV005
			m-Xylene	LT 8.	-01	BEV005
			Aldrin	LT 3.	-01	BEU007
			Arsenic	LT 2.5	+00	BFH008
			Atrazine	LT 3.	-01	BEU007
			Bicycloheptadiene	LT 4.	-01	BEV005

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program
Task 11, Site 1-7 Hydrazine Blending and Storage Facility

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Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0015	9-10	Soil	Benzene	LT 3. -01	ug/g	BEV005
			Carbon Tetrachloride	LT 3. -01	ug/g	BEV005
			Cadmium	LT 7.4 -01	ug/g	BEK016
			Methylene Chloride	LT 2. +00	ug/g	BEV005
			Chloroform	LT 3. -01	ug/g	BEV005
			Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEU007
			Chlorobenzene	LT 1. +00	ug/g	BEV005
			Chlordane	LT 2. +00	ug/g	BEU007
			p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEU007
			p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEU007
			p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEU007
			Chromium	9.3 +00	ug/g	BEK016
			Copper	7.6 +00	ug/g	BEK016
			Dibromochloropropane	LT 5.0 -03	ug/g	BEF010
			Dibromochloropropane	LT 3. -01	ug/g	BEU007
			Dibromochloropropane	LT 2. +00	ug/g	BEV005
			Dicyclopentadiene	LT 1. +00	ug/g	BEU007
			Dicyclopentadiene	LT 7. -01	ug/g	BEV005
			Vapona	LT 3. +00	ug/g	BEU007
			Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU007
			Dithiane	LT 4. -01	ug/g	BEU007
			Diethylin	LT 3. -01	ug/g	BEU007
			Dimethyldisulfide	LT 2. +01	ug/g	BEV005
			Endrin	LT 5. -01	ug/g	BEU007
			Ethylbenzene	LT 4. -01	ug/g	BEV005
			Mercury	LT 5.0 -02	ug/g	BE0016
			Hydrazine	LT 5. +01	ug/g	BE0010
			Isodrin	LT 3. -01	ug/g	BEU007
			Toluene	LT 3. -01	ug/g	BEV005
			Methylhydrazine	LT 2. +02	ug/g	BE0010
			Methylisobutyl Ketone	LT 7. -01	ug/g	BEV005
			Malathion	LT 7. -01	ug/g	BEU007
			N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BE0010
			N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BE0010

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

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Rocky Mountain Arsenal Program

Ebasco Services Incorporated

Task 11, Site 1-7 Hydrazine Blending and Storage Facility

Summary of Analytical Results

Boring Number	Depth (ft)	Sample Type	Analytical Parameters	Results	Units	Sample Number
0015	9-10	Soil	1,4-Oxathiane	LT 3. -01	ug/g	BEU007
			Lead	LT 8.4 +00	ug/g	BEK016
			Dichlorodiphenylethane	LT 6. -01	ug/g	BEU007
			Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BEU007
			Parathion	LT 9. -01	ug/g	BEU007
			2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BEU007
			Tetrachloroethene	LT 3. -01	ug/g	BEV005
			Trichloroethene	LT 5. -01	ug/g	BEV005
			Unsymmetrical Dimethyl Hydrazine	LT 2. +02	ug/g	BER010
			Ortho- & Para-Xylene	LT 5. +00	ug/g	BEV005
			Zinc	3.8 +01	ug/g	BEK016

Note: Results for Dibromochloropropane (DBCP) may appear in up to three analytical fractions.
Results for Dicyclopentadiene (DCPD) may appear in up to two analytical fractions.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program

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Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Hydrazine	LT 5.0 +01	ug/g	88G001
Blank	Unsymmetrical Dimethyl Hydrazine	LT 2.0 +02	ug/g	88H001
Blank	N-Nitrosodimethylamine	LT 2.6 -01	ug/g	88I001
Blank	N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	88J001
Blank	Methylhydrazine	LT 2.0 +02	ug/g	88J001
Blank	Dibromochloropropane	LT 5.0 -03	ug/g	88K001
Blank	Bicycloheptadiene	LT 4. -01	ug/g	88L001
Blank	Carbon Tetrachloride	LT 3. -01	ug/g	88L001
Blank	Chloroform	LT 3. -01	ug/g	88L001
Blank	Chlorobenzene	LT 1. +00	ug/g	88L001
Blank	Benzene	LT 3. -01	ug/g	88L001
Blank	Dibromochloropropane	LT 2. +00	ug/g	88L001
Blank	Dicyclopentadiene	LT 7. -01	ug/g	88L001
Blank	Dimethyldisulfide	LT 2. +01	ug/g	88L001
Blank	Ethylbenzene	LT 4. -01	ug/g	88L001
Blank	Toluene	LT 3. -01	ug/g	88L001
Blank	Methylisobutyl Ketone	LT 7. -01	ug/g	88L001
Blank	Tetrachloroethene	LT 3. -01	ug/g	88L001
Blank	Trichloroethene	LT 5. -01	ug/g	88L001
Blank	Ortho- & Para-Xylene	LT 5. +00	ug/g	88L001
Blank	1,1-Dichloroethane	LT 2. +00	ug/g	88L001
Blank	1,1,1-Trichloroethane	LT 4. -01	ug/g	88L001
Blank	1,1,2-Trichloroethane	LT 4. -01	ug/g	88L001
Blank	1,2-Dichloroethane	LT 2. +00	ug/g	88L001
Blank	1,2-Dichloroethane	LT 6. -01	ug/g	88L001
Blank	m-Xylene	LT 8. -01	ug/g	88L001
Blank	Methylene Chloride	GT 2.5 +01	ug/g	88L001
Blank	Aldrin	LT 3. -01	ug/g	88M001
Blank	Atrazine	LT 3. -01	ug/g	88M001
Blank	Chlordane	LT 2. +00	ug/g	88M001
Blank	Hexachlorocyclopentadiene	LT 6. -01	ug/g	88M001
Blank	p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	88M001
Blank	p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	88M001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program

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Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	88M001
Blank	Dibromochloropropane	LT 3. -01	ug/g	88M001
Blank	Dicyclopentadiene	LT 1. +00	ug/g	88M001
Blank	Vapona	LT 3. +00	ug/g	88M001
Blank	Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	88M001
Blank	Dithiane	LT 4. -01	ug/g	88M001
Blank	Dieldrin	LT 3. -01	ug/g	88M001
Blank	Endrin	LT 5. -01	ug/g	88M001
Blank	Isodrin	LT 3. -01	ug/g	88M001
Blank	Malathion	LT 7. -01	ug/g	88M001
Blank	1,4-Oxathiane	LT 3. -01	ug/g	88M001
Blank	Dichlorodiphenylethane	LT 6. -01	ug/g	88M001
Blank	Dichlorodiphenyltrichloro-ethane	LT 5. -01	ug/g	88M001
Blank	Parathion	LT 9. -01	ug/g	88M001
Blank	2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	88M001
Blank	Arsenic	3.0 +00	ug/g	88M001
Blank	Mercury	LT 5.0 -02	ug/g	88M001
Blank	Cadmium	LT 7.4 -01	ug/g	88P001
Blank	Chromium	1.5 +01	ug/g	88P001
Blank	Copper	1.1 +01	ug/g	88P001
Blank	Lead	1.2 +01	ug/g	88P001
Blank	Zinc	4.1 +01	ug/g	88P001
Blank	Unsymmetrical Dimethyl Hydrazine	LT 2.0 +02	ug/g	88X001
Blank	Methylhydrazine	LT 2.0 +02	ug/g	88Y001
Blank	Hydrazine	LT 5.0 +01	ug/g	88Z001
Blank	N-Nitrosodimethylamine	LT 2.6 -01	ug/g	88A001
Blank	N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	88A001
Blank	Dibromochloropropane	LT 5.0 -03	ug/g	88C001
Blank	Aldrin	LT 3. -01	ug/g	88C001
Blank	Atrazine	LT 3. -01	ug/g	88C001
Blank	Chlordane	LT 2. +00	ug/g	88C001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

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Summary of Analytical Results

Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCD001
Blank	p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCD001
Blank	p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCD001
Blank	p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCD001
Blank	Dibromochloropropane	LT 3. -01	ug/g	BCD001
Blank	Dicyclopentadiene	LT 1. +00	ug/g	BCD001
Blank	Vapona	LT 3. +00	ug/g	BCD001
Blank	Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCD001
Blank	Dithiane	LT 4. -01	ug/g	BCD001
Blank	Dieldrin	LT 3. -01	ug/g	BCD001
Blank	Endrin	LT 5. -01	ug/g	BCD001
Blank	Isodrin	LT 3. -01	ug/g	BCD001
Blank	Melathion	LT 7. -01	ug/g	BCD001
Blank	1,4-Oxathiane	LT 3. -01	ug/g	BCD001
Blank	Dichlorodiphenylethane	LT 6. -01	ug/g	BCD001
Blank	Dichlorodiphenyltrichloro-ethane	LT 5. -01	ug/g	BCD001
Blank	Parathion	LT 9. -01	ug/g	BCD001
Blank	2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCD001
Blank	Bicycloheptadiene	LT 4. -01	ug/g	BCE001
Blank	Carbon Tetrachloride	LT 3. -01	ug/g	BCE001
Blank	Chloroform	LT 3. -01	ug/g	BCE001
Blank	Chlorobenzene	LT 1. +00	ug/g	BCE001
Blank	Benzene	LT 3. -01	ug/g	BCE001
Blank	Dibromochloropropane	LT 2. +00	ug/g	BCE001
Blank	Dicyclopentadiene	LT 7. -01	ug/g	BCE001
Blank	Dimethyldisulfide	LT 2. +01	ug/g	BCE001
Blank	Ethylbenzene	LT 4. -01	ug/g	BCE001
Blank	Toluene	LT 3. -01	ug/g	BCE001
Blank	Methylisobutyl Ketone	LT 7. -01	ug/g	BCE001
Blank	Tetrachloroethene	LT 3. -01	ug/g	BCE001
Blank	Trichloroethene	LT 5. -01	ug/g	BCE001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program

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Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Ortho- & Para-Xylene	LT 5. +00	ug/g	BCE001
Blank	1,1-Dichloroethane	LT 2. +00	ug/g	BCE001
Blank	1,1,1-Trichloroethane	LT 4. -01	ug/g	BCE001
Blank	1,1,2-Trichloroethane	LT 4. -01	ug/g	BCE001
Blank	1,2-Dichloroethane	LT 2. +00	ug/g	BCE001
Blank	1,2-Dichloroethane	LT 6. -01	ug/g	BCE001
Blank	m-Xylene	LT 8. -01	ug/g	BCE001
Blank	Methylene Chloride	LT 6.4 +00	ug/g	BCE001
Blank	N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BCN001
Blank	N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BCN001
Blank	Unsymmetrical Dimethyl Hydrazine	LT 2.0 +02	ug/g	BCO001
Blank	Methylhydrazine	LT 2.0 +02	ug/g	BCP001
Blank	Hydrazine	LT 5.0 +01	ug/g	BCO001
Blank	Dibromochloropropane	LT 5.0 -03	ug/g	BCR001
Blank	Aldrin	LT 3. -01	ug/g	BCS001
Blank	Atrazine	LT 3. -01	ug/g	BCS001
Blank	Chlordane	LT 2. +00	ug/g	BCS001
Blank	Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCS001
Blank	p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCS001
Blank	p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCS001
Blank	p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCS001
Blank	Dibromochloropropane	LT 3. -01	ug/g	BCS001
Blank	Dicyclopentadiene	LT 1. +00	ug/g	BCS001
Blank	Vapona	LT 3. +00	ug/g	BCS001
Blank	Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCS001
Blank	Dithiane	LT 4. -01	ug/g	BCS001
Blank	Dieldrin	LT 3. -01	ug/g	BCS001
Blank	Endrin	LT 5. -01	ug/g	BCS001
Blank	Isodrin	LT 3. -01	ug/g	BCS001
Blank	Malathion	LT 7. -01	ug/g	BCS001
Blank	1,4-Oxathiane	LT 3. -01	ug/g	BCS001
Blank	Dichlorodiphenylethane	LT 6. -01	ug/g	BCS001
Blank	Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCS001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program

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Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Parathion	LT 9. -01	ug/g	BCS001
Blank	2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BCS001
Blank	Bicycloheptadiene	LT 4. -01	ug/g	BC1001
Blank	Carbon Tetrachloride	LT 3. -01	ug/g	BC1001
Blank	Chloroform	LT 3. -01	ug/g	BC1001
Blank	Methylene Chloride	LT 2. +00	ug/g	BC1001
Blank	Chlorobenzene	LT 1. +00	ug/g	BC1001
Blank	Benzene	LT 3. -01	ug/g	BC1001
Blank	Dibromochloropropane	LT 2. +00	ug/g	BC1001
Blank	Dicyclopentadiene	LT 7. -01	ug/g	BC1001
Blank	Dimethyldisulfide	LT 2. +01	ug/g	BC1001
Blank	Ethylbenzene	LT 4. -01	ug/g	BC1001
Blank	Toluene	LT 3. -01	ug/g	BC1001
Blank	Methylisobutyl Ketone	LT 7. -01	ug/g	BC1001
Blank	Tetrachloroethene	LT 3. -01	ug/g	BC1001
Blank	Trichloroethene	LT 5. -01	ug/g	BC1001
Blank	Ortho- & Para-Xylene	LT 5. +00	ug/g	BC1001
Blank	1,1-Dichloroethane	LT 2. +00	ug/g	BC1001
Blank	1,1,1-Trichloroethane	LT 4. -01	ug/g	BC1001
Blank	1,1,2-Trichloroethane	LT 4. -01	ug/g	BC1001
Blank	1,2-Dichloroethane	LT 2. +00	ug/g	BC1001
Blank	1,2-Dichloroethane	LT 6. -01	ug/g	BC1001
Blank	m-Xylene	LT 8. -01	ug/g	BC1001
Blank	Bicycloheptadiene	LT 4. -01	ug/g	BCU001
Blank	Carbon Tetrachloride	LT 3. -01	ug/g	BCU001
Blank	Methylene Chloride	LT 2. +00	ug/g	BCU001
Blank	Chlorobenzene	LT 1. +00	ug/g	BCU001
Blank	Benzene	LT 3. -01	ug/g	BCU001
Blank	Dibromochloropropane	LT 2. +00	ug/g	BCU001
Blank	Dicyclopentadiene	LT 7. -01	ug/g	BCU001
Blank	Dimethyldisulfide	LT 2. +01	ug/g	BCU001
Blank	Ethylbenzene	LT 4. -01	ug/g	BCU001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Toluene	LT 3. -01	ug/g	BCU001
Blank	Methylisobutyl Ketone	LT 7. -01	ug/g	BCU001
Blank	Tetrachloroethene	LT 3. -01	ug/g	BCU001
Blank	Trichloroethene	LT 5. -01	ug/g	BCU001
Blank	Ortho- & Para-Xylene	LT 5. +00	ug/g	BCU001
Blank	1,1-Dichloroethane	LT 2. +00	ug/g	BCU001
Blank	1,1,1-Trichloroethane	LT 4. -01	ug/g	BCU001
Blank	1,1,2-Trichloroethane	LT 4. -01	ug/g	BCU001
Blank	1,2-Dichloroethane	LT 2. +00	ug/g	BCU001
Blank	1,2-Dichloroethane	LT 6. -01	ug/g	BCU001
Blank	m-Xylene	LT 8. -01	ug/g	BCU001
Blank	Chloroform	LT 3. -01	ug/g	BCU001
Blank	Aldrin	LT 3. -01	ug/g	BCV001
Blank	Atrazine	LT 3. -01	ug/g	BCV001
Blank	Chlordane	LT 2. +00	ug/g	BCV001
Blank	Hexachlorocyclopentadiene	LT 6. -01	ug/g	BCV001
Blank	p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BCV001
Blank	p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BCV001
Blank	p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BCV001
Blank	Dibromochloropropane	LT 3. -01	ug/g	BCV001
Blank	Dicyclopentadiene	LT 1. +00	ug/g	BCV001
Blank	Vapona	LT 3. +00	ug/g	BCV001
Blank	Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BCV001
Blank	Dithiane	LT 4. -01	ug/g	BCV001
Blank	Dieldrin	LT 3. -01	ug/g	BCV001
Blank	Endrin	LT 5. -01	ug/g	BCV001
Blank	Isodrin	LT 3. -01	ug/g	BCV001
Blank	Malathion	LT 7. -01	ug/g	BCV001
Blank	1,4-Oxathiane	LT 3. -01	ug/g	BCV001
Blank	Dichlorodiphenylethane	LT 6. -01	ug/g	BCV001
Blank	Dichlorodiphenyltrichloroethane	LT 5. -01	ug/g	BCV001
Blank	Parathion	LT 9. -01	ug/g	BCV001
Blank	2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BCV001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

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Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Cadmium	LT 7.4 -01	ug/g	BCX001
Blank	Chromium	1.5 +01	ug/g	BCX001
Blank	Copper	1.1 +01	ug/g	BCX001
Blank	Lead	LT 8.4 +00	ug/g	BCX001
Blank	Zinc	4.2 +01	ug/g	BCX001
Blank	Mercury	LT 5.0 -02	ug/g	BCY001
Blank	Arsenic	LT 2.5 +00	ug/g	BCO001
Blank	Bicycloheptadiene	LT 3. -01	ug/g	SDM001
Blank	Carbon Tetrachloride	LT 3. -01	ug/g	SDM001
Blank	Chloroform	LT 3. -01	ug/g	SDM001
Blank	Methylene Chloride	LT 7. -01	ug/g	SDM001
Blank	Chlorobenzene	LT 3. -01	ug/g	SDM001
Blank	Benzene	LT 3. -01	ug/g	SDM001
Blank	Dibromochloropropane	LT 4. -01	ug/g	SDM001
Blank	Dicyclopentadiene	LT 3. -01	ug/g	SDM001
Blank	Dimethyldisulfide	LT 8. -01	ug/g	SDM001
Blank	Ethylbenzene	LT 3. -01	ug/g	SDM001
Blank	Toluene	LT 3. -01	ug/g	SDM001
Blank	Methylisobutyl Ketone	LT 3. -01	ug/g	SDM001
Blank	Tetrachloroethene	LT 3. -01	ug/g	SDM001
Blank	Trichloroethene	LT 3. -01	ug/g	SDM001
Blank	Ortho- & Para-Xylene	LT 3. -01	ug/g	SDM001
Blank	1,1-Dichloroethane	LT 9. -01	ug/g	SDM001
Blank	1,1,1-Trichloroethane	LT 3. -01	ug/g	SDM001
Blank	1,1,2-Trichloroethane	LT 3. -01	ug/g	SDM001
Blank	1,2-Dichloroethane	LT 3. -01	ug/g	SDM001
Blank	1,2-Dichloroethane	LT 3. -01	ug/g	SDM001
Blank	m-Xylene	LT 7. -01	ug/g	SDM001
Blank	Aldrin	LT 3. -01	ug/g	SDP001
Blank	Atrazine	LT 3. -01	ug/g	SDP001
Blank	Chlordane	LT 6. -01	ug/g	SDP001
Blank	Hexachlorocyclopentadiene	LT 3. -01	ug/g	SDP001
Blank	p-Chlorophenylmethyl Sulfide	LT 4. +00	ug/g	SDP001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program

11/07/86

Blanks Associated with Task 11. Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	p-Chlorophenylmethyl Sulfoxide	LT 7. +00	ug/g	BDP001
Blank	p-Chlorophenylmethyl Sulfone	LT 6. -01	ug/g	BDP001
Blank	Dibromochloropropane	LT 3. -01	ug/g	BDP001
Blank	Dicyclopentadiene	LT 4. -01	ug/g	BDP001
Blank	Vapona	LT 3. -01	ug/g	BDP001
Blank	Diisopropylmethyl Phosphonate	LT 3. -01	ug/g	BDP001
Blank	Dithiane	LT 7. +00	ug/g	BDP001
Blank	Dieldrin	LT 3. -01	ug/g	BDP001
Blank	Endrin	LT 3. -01	ug/g	BDP001
Blank	Isodrin	LT 3. -01	ug/g	BDP001
Blank	Malathion	LT 3. -01	ug/g	BDP001
Blank	1,4-Oxathiane	LT 6. +00	ug/g	BDP001
Blank	Dichlorodiphenylethane	LT 3. -01	ug/g	BDP001
Blank	Dichlorodiphenyltrichloro-ethane	LT 6. -01	ug/g	BDP001
Blank	Parathion	LT 4. -01	ug/g	BDP001
Blank	2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 3. -01	ug/g	BDP001
Blank	Dibromochloropropane	LT 5.0 -03	ug/g	BDP001
Blank	Unsymmetrical Dimethyl Hydrazine	LT 2.0 +02	ug/g	BDP001
Blank	Methylhydrazine	LT 2.0 +02	ug/g	BDP001
Blank	Hydrazine	LT 5.0 +01	ug/g	BDP001
Blank	N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BDP001
Blank	Hydrazine	LT 5.0 +01	ug/g	BDP001
Blank	Methylhydrazine	LT 2.0 +02	ug/g	BDP001
Blank	Unsymmetrical Dimethyl Hydrazine	LT 2.0 +02	ug/g	BDP001
Blank	N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BDP001
Blank	N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BDP001
Blank	Dibromochloropropane	LT 5.0 -03	ug/g	BDP001
Blank	Aldrin	LT 3. -01	ug/g	BDP001
Blank	Atrazine	LT 3. -01	ug/g	BDP001
Blank	Chlordane	LT 2. +00	ug/g	BDP001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program

11/07/86

Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Hexachlorocyclopentadiene	LT 6. -01	ug/g	BED001
Blank	p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BED001
Blank	p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BED001
Blank	p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BED001
Blank	Dibromochloropropane	LT 3. -01	ug/g	BED001
Blank	Dicyclopentadiene	LT 1. +00	ug/g	BED001
Blank	Vapors	LT 3. +00	ug/g	BED001
Blank	Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BED001
Blank	Dithiane	LT 4. -01	ug/g	BED001
Blank	Dieldrin	LT 3. -01	ug/g	BED001
Blank	Endrin	LT 5. -01	ug/g	BED001
Blank	Isodrin	LT 3. -01	ug/g	BED001
Blank	Malethion	LT 7. -01	ug/g	BED001
Blank	1,4-Oxathiane	LT 3. -01	ug/g	BED001
Blank	Dichlorodiphenylethane	LT 6. -01	ug/g	BED001
Blank	Dichlorodiphenyltrichloro-ethane	LT 5. -01	ug/g	BED001
Blank	Parathion	LT 9. -01	ug/g	BED001
Blank	2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BED001
Blank	Bicycloheptadiene	LT 4. -01	ug/g	BEG001
Blank	Carbon Tetrachloride	LT 3. -01	ug/g	BEG001
Blank	Chloroform	LT 3. -01	ug/g	BEG001
Blank	Methylene Chloride	LT 2. +00	ug/g	BEG001
Blank	Chlorobenzene	LT 1. +00	ug/g	BEG001
Blank	Benzene	LT 3. -01	ug/g	BEG001
Blank	Dibromochloropropane	LT 2. +00	ug/g	BEG001
Blank	Dicyclopentadiene	LT 7. -01	ug/g	BEG001
Blank	Dimethyldisulfide	LT 2. +01	ug/g	BEG001
Blank	Ethylbenzene	LT 4. -01	ug/g	BEG001
Blank	Toluene	LT 3. -01	ug/g	BEG001
Blank	Methylisobutyl Ketone	LT 7. -01	ug/g	BEG001
Blank	Tetrachloroethene	LT 3. -01	ug/g	BEG001
Blank	Trichloroethene	LT 5. -01	ug/g	BEG001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program

11/07/86

Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Ortho- & Para-Xylene	LT 5. +00	ug/g	BEG001
Blank	1,1-Dichloroethane	LT 2. +00	ug/g	BEG001
Blank	1,1,1-Trichloroethane	LT 4. -01	ug/g	BEG001
Blank	1,1,2-Trichloroethane	LT 4. -01	ug/g	BEG001
Blank	1,2-Dichloroethane	LT 2. +00	ug/g	BEG001
Blank	1,2-Dichloroethane	LT 6. -01	ug/g	BEG001
Blank	m-Xylene	LT 8. -01	ug/g	BEG001
Blank	Cadmium	LT 7.4 -01	ug/g	BEK001
Blank	Chromium	1.1 +01	ug/g	BEK001
Blank	Copper	1.0 +01	ug/g	BEK001
Blank	Lead	1.4 +01	ug/g	BEK001
Blank	Zinc	4.5 +01	ug/g	BEK001
Blank	Mercury	5.8 -02	ug/g	BE0001
Blank	Dibromochloropropane	LT 5.0 -03	ug/g	BE0001
Blank	N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BE0001
Blank	N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BE0001
Blank	Unsymmetrical Dimethyl Hydrazine	LT 2.0 +02	ug/g	BE0001
Blank	Hydrazine	LT 5.0 +01	ug/g	BES001
Blank	Methylhydrazine	LT 2.0 +02	ug/g	BES001
Blank	Aldrin	LT 3. -01	ug/g	BEU001
Blank	Atrazine	LT 3. -01	ug/g	BEU001
Blank	Chlordane	LT 2. +00	ug/g	BEU001
Blank	Hexachlorocyclopentadiene	LT 6. -01	ug/g	BEU001
Blank	p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BEU001
Blank	p-Chlorophenylmethyl Sulfoxide	LT 3. -01	ug/g	BEU001
Blank	p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BEU001
Blank	Dibromochloropropane	LT 3. -01	ug/g	BEU001
Blank	Dicyclopentadiene	LT 1. +00	ug/g	BEU001
Blank	Vapona	LT 3. +00	ug/g	BEU001
Blank	Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BEU001
Blank	Oithiane	LT 4. -01	ug/g	BEU001
Blank	Dieldrin	LT 3. -01	ug/g	BEU001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Ebasco Services Incorporated
Summary of Analytical Results

Rocky Mountain Arsenal Program

11/07/86

Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Endrin	LT 5. -01	ug/g	BEU001
Blank	Isodrin	LT 3. -01	ug/g	BEU001
Blank	Malathion	LT 7. -01	ug/g	BEU001
Blank	1,4-Oxathiane	LT 3. -01	ug/g	BEU001
Blank	Dichlorodiphenylethane	LT 6. -01	ug/g	BEU001
Blank	Dichlorodiphenyltrichloro-ethane	LT 5. -01	ug/g	BEU001
Blank	Parathion	LT 9. -01	ug/g	BEU001
Blank	2-Chloro-1(2,4-Dichlorophenyl) Vinyl diethyl Phosphates	LT 6. -01	ug/g	BEU001
Blank	Bicycloheptadiene	LT 4. -01	ug/g	BEV001
Blank	Carbon Tetrachloride	LT 3. -01	ug/g	BEV001
Blank	Chloroform	LT 3. -01	ug/g	BEV001
Blank	Methylene Chloride	LT 2. +00	ug/g	BEV001
Blank	Chlorobenzene	LT 1. +00	ug/g	BEV001
Blank	Benzene	LT 3. -01	ug/g	BEV001
Blank	Dibromochloropropane	LT 2. +00	ug/g	BEV001
Blank	Dicyclopentadiene	LT 7. -01	ug/g	BEV001
Blank	Dimethyldisulfide	LT 2. +01	ug/g	BEV001
Blank	Ethylbenzene	LT 4. -01	ug/g	BEV001
Blank	Toluene	LT 3. -01	ug/g	BEV001
Blank	Methylisobutyl Ketone	LT 7. -01	ug/g	BEV001
Blank	Tetrachloroethene	LT 3. -01	ug/g	BEV001
Blank	Trichloroethene	LT 5. -01	ug/g	BEV001
Blank	Ortho- & Para-Xylene	LT 5. +00	ug/g	BEV001
Blank	1,1-Dichloroethane	LT 2. +00	ug/g	BEV001
Blank	1,1,1-Trichloroethane	LT 4. -01	ug/g	BEV001
Blank	1,1,2-Trichloroethane	LT 4. -01	ug/g	BEV001
Blank	1,2-Dichloroethane	LT 2. +00	ug/g	BEV001
Blank	1,2-Dichloroethane	LT 6. -01	ug/g	BEV001
Blank	m-Xylene	LT 8. -01	ug/g	BEV001
Blank	N-Nitrosodimethylamine	LT 2.6 -01	ug/g	BEV001
Blank	N-Nitrosodi-N-Propylamine	LT 1.0 -01	ug/g	BEV001
Blank	Unsymmetrical Dimethyl Hydrazine	LT 2.0 +02	ug/g	BEV001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Methylhydrazine	LT 2.0 +02	ug/g	BFA001
Blank	Hydrazine	LT 5.0 +01	ug/g	BFB001
Blank	Dibromochloropropane	LT 5.0 -03	ug/g	BFC001
Blank	Aldrin	LT 3. -01	ug/g	BFD001
Blank	Atrazine	LT 3. -01	ug/g	BFD001
Blank	Chlordane	LT 2. +00	ug/g	BFD001
Blank	Hexachlorocyclopentadiene	LT 6. -01	ug/g	BFD001
Blank	p-Chlorophenylmethyl Sulfide	LT 9. -01	ug/g	BFD001
Blank	p-Chlorophenylmethyl Sulfonide	LT 3. -01	ug/g	BFD001
Blank	p-Chlorophenylmethyl Sulfone	LT 3. -01	ug/g	BFD001
Blank	Dibromochloropropane	LT 3. -01	ug/g	BFD001
Blank	Dicyclopentadiene	LT 1. +00	ug/g	BFD001
Blank	Vapona	LT 3. +00	ug/g	BFD001
Blank	Diisopropylmethyl Phosphonate	LT 1. +00	ug/g	BFD001
Blank	Dithiane	LT 4. -01	ug/g	BFD001
Blank	Diendrin	LT 3. -01	ug/g	BFD001
Blank	Endrin	LT 5. -01	ug/g	BFD001
Blank	Isodrin	LT 3. -01	ug/g	BFD001
Blank	Melathion	LT 7. -01	ug/g	BFD001
Blank	1,4-Oxathiane	LT 3. -01	ug/g	BFD001
Blank	Dichlorodiphenylethane	LT 6. -01	ug/g	BFD001
Blank	Dichlorodiphenyltrichloro-ethane	LT 5. -01	ug/g	BFD001
Blank	Parathion	LT 9. -01	ug/g	BFD001
Blank	2-Chloro-1(2,4-Dichlorophenyl) Vinylidethyl Phosphates	LT 6. -01	ug/g	BFD001
Blank	Bicycloheptadiene	LT 4. -01	ug/g	BFF001
Blank	Carbon Tetrachloride	LT 3. -01	ug/g	BFF001
Blank	Chloroform	LT 3. -01	ug/g	BFF001
Blank	Methylene Chloride	LT 2. +00	ug/g	BFF001
Blank	Chlorobenzene	LT 1. +00	ug/g	BFF001
Blank	Benzene	LT 3. -01	ug/g	BFF001
Blank	Dibromochloropropane	LT 2. +00	ug/g	BFF001
Blank	Dicyclopentadiene	LT 7. -01	ug/g	BFF001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Ebasco Services Incorporated

Rocky Mountain Arsenal Program

11/07/86

Summary of Analytical Results

Blanks Associated with Task 11, Site 1-7
Hydrazine Blending and Storage Facility

Type	Analytical Parameters	Results	Units	Sample Number
Blank	Ethylbenzene	LT 4. -01	ug/g	BFF001
Blank	Toluene	LT 3. -01	ug/g	BFF001
Blank	Methylisobutyl Ketone	LT 7. -01	ug/g	BFF001
Blank	Tetrachloroethene	LT 3. -01	ug/g	BFF001
Blank	Trichloroethene	LT 5. -01	ug/g	BFF001
Blank	Ortho- & Para-Xylene	LT 5. +00	ug/g	BFF001
Blank	1,1-Dichloroethane	LT 2. +00	ug/g	BFF001
Blank	1,1,1-Trichloroethane	LT 4. -01	ug/g	BFF001
Blank	1,1,2-Trichloroethane	LT 4. -01	ug/g	BFF001
Blank	1,2-Dichloroethene	LT 2. +00	ug/g	BFF001
Blank	1,2-Dichloroethane	LT 6. -01	ug/g	BFF001
Blank	m-Xylene	LT 8. -01	ug/g	BFF001
Blank	Dimethyldisulfide	LT 2. +01	ug/g	BFF001
Blank	Arsenic	2.8 +00	ug/g	BFF001
Blank	Cadmium	LT 7.4 -01	ug/g	BF1001
Blank	Chromium	8.1 +00	ug/g	BF1001
Blank	Copper	9.6 +00	ug/g	BF1001
Blank	Lead	LT 8.4 +00	ug/g	BF1001
Blank	Zinc	3.7 +01	ug/g	BF1001
Blank	Mercury	LT 5.0 -02	ug/g	BFJ001

Note: Blanks are matched to analytical lots by the first three characters in the Sample Number.

Appendix 1-7-C

Comments and Responses

Shell Oil Company



One Shell Plaza
P.O. Box 2463
Houston, Texas 77252

February 18, 1988

USATHAMA
Office of the Program Manager
Rocky Mountain Arsenal Contamination Cleanup
ATTN: AMXRM-EE: Chief: Mr. Donald L. Campbell
Bldg. E4460
Aberdeen Proving Ground, MD 21010-5401

Dear Mr. Campbell:

Enclosed herewith are Shell Oil's comments on Draft Final Contamination Assessment Report - Site 1-7, Hydrazine Blending and Storage Facility, Task 11, January 1988.

Sincerely,

C. K. Hahn
Manager
Denver Site Project

RDL:ajg

Enclosure

cc: (w/enclosure)
USATHAMA
Office of the Program Manager
Rocky Mountain Arsenal Contamination Cleanup
ATTN: AMXRM-EE: Mr. Kevin T. Blose
Bldg. E4460
Aberdeen Proving Ground, MD 21010-5401

Mr. Brian L. Anderson
Program Manager's Office
Rocky Mountain Contamination Cleanup: AMXRM-PM-R
Bldg. 111
Rocky Mountain Arsenal
Commerce City, CO 80022

BRM8801803 - 0001.0.0

cc: David L. Anderson, Esq.
Environmental Enforcement Section
Land & Natural Resources Division
U.S. Department of Justice
P.O. Box 23896
Washington, D.C. 20026

Lt. Col. Scott P. Isaacson
Headquarters - Department of the Army
ATTN: DAJA-LTE
Washington, DC 20310-2210

Ms. Patricia Bohm
Office of Attorney General
CERCLA Litigation Section
1560 Broadway, Suite 250
Denver, CO 80202

Mr. Jeff Edson
Hazardous Materials and Waste Management Division
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

Mr. Robert L. Duprey
Director, Air and Waste Management Division
U.S. Environmental Protection Agency, Region VIII
One Denver Place
999 18th Street, Suite 1300
Denver, CO 80202-2413

Mr. Connally Mears
Air and Waste Management Division
U.S. Environmental Protection Agency, Region VIII
One Denver Place
999 18th Street, Suite 1300
Denver, CO 80202-2413

Mr. Thomas P. Looby
Assistant Director
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

RESPONSES TO SPECIFIC COMMENTS OF
SHELL OIL COMPANY ON
DRAFT FINAL CONTAMINATION ASSESSMENT REPORT,
SITE 1-7, HYDRAZINE BLENDING AND STORAGE FACILITY

Comment 1:
page 7,
first full
paragraph

The ranges of hydraulic conductivities reported as "low" and "moderate" are not representative for the composition of materials described in Section 1.2, geology. For alluvium consisting of silt, clayey sand, and silty sand, a more representative range of hydraulic conductivity is 10^{-4} to 10^{-6} cm/sec. The range of hydraulic conductivity in claystone and silty claystone bedrock is most likely 10^{-7} to 10^{-10} cm/sec.

It is possible that the ranges listed in the text are applicable depending upon grain-size distributions, stratification, degree of consolidation, etc., but they should be substantiated by testing.

Response:

Since no hydraulic conductivity tests exist on the aquifer below this site, the discussion of conductivities has been deleted.

Comment 2:
page 11,
second full
paragraph

Change to: "does not impy that the HBSF is or is
not contributing..."

Response:

This statement has been rephrased.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII

999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2405

Ref: 8HWM-SR

JUL 13 1988

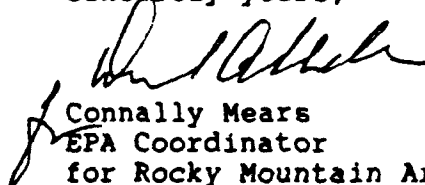
Mr. Donald L. Campbell
Deputy Program Manager
Office of the Program Manager
for Rocky Mountain Arsenal
ATTN: AMXRM-TO
Commerce City, Colorado 80022-2180

Re: Rocky Mountain Arsenal (RMA),
Task 11, Site 1-7, Draft Final
Contamination Assessment Report,
Hydrazine Blending and Storage
Facility, January, 1988.

Dear Mr. Campbell:

We have reviewed the above referenced report and have the
enclosed comments from our contractor. Please contact me at
(303) 293-1528, if you have questions on this matter.

Sincerely yours,


Connally Mears
EPA Coordinator
for Rocky Mountain Arsenal Cleanup

Enclosure

cc: Thomas P. Looby, CDH
David Shelton, CDH
Chris Hahn, Shell Oil Company
R. D. Lundahl, Shell Oil Company
Thomas Bick, Department of Justice
David Anderson, Department of Justice
Preston Chiaro, EBASCO
Lt. Colonel Scott P. Isaacson

RESPONSE TO GENERAL COMMENT OF
ENVIRONMENTAL PROTECTION AGENCY ON
DRAFT FINAL CONTAMINATION ASSESSMENT REPORT,
SITE 1-7, HYDRAZINE BLENDING AND STORAGE FACILITY

Comment 1: Although this investigation was adequate as an initial, gross characterization of Site 1-7, detailed confirmatory soil sampling will be required in certain areas during remedial activities, specifically around and under the 44,000 gallon in ground concrete wastewater tank, the drum storage pad, the bulk storage areas, spill/overflow areas, the loading dock, the drum cleaning shed, as well as the specific source locations indicated on page 14. The integrity of the various structures should be evaluated in order to guide sampling. The analytical suite should include hydrazine breakdown products.

Response: The Phase II program described in the draft final CAR has been revised to include soils sampling in areas of possible spills, leakage, and overflow. For this program, GC analytical methods with lower detection limits will be developed and certified for hydrazines and nitrosamines, and these analyses will be conducted on samples from 5 ft intervals in the borings. Some of the additional analyses will be conducted on samples from Boring 25 by the loading dock and Boring 29 between the loading dock and drum storage pad. Other borings (38-52) will be drilled near the loading docks, blender, drum filling station, drum cleaning shed, drum storage pad, in-ground tank, and west and east yard diked areas around storage tanks. The number, depths, and locations of these borings may be changed according to information that may be obtained from study of aerial photographs and from site inspection. This program may also be revised depending on the interim remedial action developed for this site.

The planned locations of borings will allow sampling in areas that might have been affected by the "specific source locations indicated on page 14" because those locations are contained in the structures already mentioned. With regard to including hydrazine breakdown products in the

RESPONSE TO GENERAL COMMENT OF
ENVIRONMENTAL PROTECTION AGENCY ON
DRAFT FINAL CONTAMINATION ASSESSMENT REPORT,
SITE 1-7, HYDRAZINE BLENDING AND STORAGE FACILITY

analytical suite, except for hydrazines and nitrosamines, the compounds listed in Section 2.0 of this report are quickly oxidized or otherwise unstable in the environment, are quickly biodegraded, or are gases that would dissipate in air rather than entering the soils. Some, such as ammonia and methane, for example, are of little interest. For these reasons, only hydrazines and their relatively more persistent breakdown products, nitrosamines, were included as target analytes in the Phase I program. The other less persistent compounds would have been detected in the nontarget fraction if they had been present at substantial concentrations, but none of them were found.

RESPONSES TO SPECIFIC COMMENTS OF
ENVIRONMENTAL PROTECTION AGENCY ON
DRAFT FINAL CONTAMINATION ASSESSMENT REPORT,
SITE 1-7, HYDRAZINE BLENDING AND STORAGE FACILITY

Comment 2: What is the waste pit shown on all the site figures? Is it the same as the in ground concrete tank? Where is the drum cleaning shed (mentioned on page 11) located? It is not shown on the figures.

Response: The waste pit shown on the figures is the same as the in-ground concrete tank discussed in the text. The text and figures have been revised to refer to this feature consistently as the in-ground concrete tank or simply in-ground tank. Also, the drum cleaning shed is now shown on the figures.

Comment 3: The text indicates that the bulge in the water table contours may be the result of an area of high infiltration capacity or a regular water source beneath the West Yard. The sewer system is suggested as a possible water source. Could the possible source be the 44,000 gallon wastewater tank as well as the sewer system? The water level in every well listed on Table 1-7-1 rose from one to three feet between February 1985 and May 1986. This increase may imply leakage from the tank. This potential should be addressed in the text.

Response: The increase in the groundwater elevations below the site is more likely to result from seasonal recharge of the aquifer from snowmelt and rain. Recharge of aquifers in the spring is not uncommon in the Rocky Mountain region, but we have no information to suggest that the in-ground tank would have leaked between those two dates. Furthermore, the text has now been revised to state that a careful review of the groundwater elevation data indicates that local sources of potential recharge, such as the in-ground tank, do not fit the pattern of irregularity in the water table that is shown by Figure 1-7-5. This pattern is best explained by differences in surveying or in construction techniques used during the installation of Wells 01051 through 01056 compared to other wells in the area. These differences have resulted in data that may not be

RESPONSES TO SPECIFIC COMMENTS OF
ENVIRONMENTAL PROTECTION AGENCY ON
DRAFT FINAL CONTAMINATION ASSESSMENT REPORT,
SITE 1-7, HYDRAZINE BLENDING AND STORAGE FACILITY

comparable between the two sets of wells. This explanation is favored because mapping the data separately for the two sets of wells eliminates the irregularity. None of the other possible explanations for the irregularity, such as changes in the physical properties of the aquifer across the area, are supported by our data.

Comment 4:
page 7,
second
paragraph,
and
Appendix C

The text indicates that historical water quality analyses do not indicate the presence of a contaminant source in this area. EPA does not agree that these analyses (Appendix C) fail to indicate that the hydrazine facility is not [sic] the source of ground water contamination in this area. Hydrazines have been detected in ground water beneath and near Site 1-7, specifically in wells 01008, 01019, 01036, 01051, 01052, 01053, 01054, 01055, and 01056. These data strongly suggest that Site 1-7 may be the source. EPA feels that more discussion is warranted on the significance of these ground water analytical data. For example, what is a possible explanation for the presence of hydrazine in wells located upgradient of Site 1-7 (wells 01056, 01055, and 01054)?

Response:

The data in the draft final version of this report that showed hydrazines in all of the wells around Site 1-7 were misleading because hydrazines were also detected in the blanks associated with these samples. The presence of hydrazines in the blanks suggests that although the method may have been capable of detecting hydrazines when they were present, it also could yield false positive results. The reported presence of hydrazine in upgradient wells, which EPA noted, is further evidence that false positives were reported, as Site 1-7 is the only logical potential source of hydrazines and nitrosamines in this area.

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Because of the suspected false positive results from the spectrophotometric method that was used, new gas chromatographic (GC) methods were developed and certified for analyzing hydrazines and nitrosamines in water. The detection limits of the new methods are similar to those of the old ones except for monomethyl hydrazine, for which the detection limit by the GC method is 2,970 ug/l, compared to 20 ug/l by the method used previously.

After GC methods were certified, the same wells and an additional downgradient well were resampled in May 1988 and analyzed for hydrazines and nitrosamines using the GC methods. No hydrazines or nitrosamines were detected in any well (or in the blanks) using the GC methods. These results tend to confirm that the original sampling and analyses yielded false positive results.

Comment 5:
page 13,
first full
paragraph

Large quantities of sludge generated from the treatment of wastewaters from the hydrazine facility with calcium hypochlorite were collected, drummed, and transported to pits in Section 36. The locations of the pits are unknown. EPA is concerned that these drum disposal pits may go uninvestigated. As CDH expressed in their fifth comment, the text should indicate whether these pits are to be investigated and if not, why.

Response:

No investigation of the pits is planned because, as EPA noted, it is unknown which pits in Section 36 were used for this disposal.

Comment 6:
pages 14-15

Reportedly uncontaminated water was disposed of in fields east and south of site 1-7 after the fire system malfunctioned and discharged a large volume of water into the bermed area around a UDMH storage tank. These fields were sampled in the Section 1-UNC investigation; however soil samples were not analyzed for hydrazine or related breakdown products. Since no analyses are available to document that this water was

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uncontaminated and since the same storage tank was reported to have a leak (page 14), it is possible that the water disposed of in these fields may have been contaminated. As pointed out by CDH in their comments, this potential contamination would not have been detected by the Section 1-UNC investigation. As a result, EPA recommends that these fields be sampled and analyzed for the appropriate parameters in the Phase II investigation for Site 1-7. Was the December 1982 fire water discharge also pumped to these fields?

Response:

The area to the south of Site 1-7 is included in Site 1-6, open storage area, which was investigated as part of the Section 1 nonsource area. Four additional borings were drilled in Site 1-6 in 1988 and were sampled in the 0 to 1 and 4 to 5 ft intervals. Each sample was analyzed for hydrazines and nitrosamines in addition to other analytes. Preliminary (Level 1) data from the four additional borings drilled in Site 1-6 reveal no evidence of hydrazines, nitrosamines, or related compounds. The Level 2 results of this investigation will be reported in a Phase II addendum to the Section 1-UNC Contamination Assessment Report.

It is unknown whether the December 1982 fire control system water was pumped into the same location.

Comment 7:
page 16,
boring
locations

Every ditch leaving the site had a boring except the ditch flowing from the north-central part of the site. It is recommended that a boring be drilled in this ditch during the Phase II investigation.

Response:

The Phase II program has been revised to include plans to sample soils below the ditch to a depth of 5 ft. The samples will be analyzed for Phase I analytes, hydrazines, and nitrosamines.

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Comment 8:
page 41,
section
3.2.5

All Phase I results were below detection limit for hydrazines and selected degradation products (Table 1-7-3). However, the results of a previous soil gas study (page 15) suggest that hydrazines may be present in soils at this site since levels of nitrogen over 20 times background values were observed. Given the results of this previous study, the fact that hydrazines have been detected in ground water beneath the site, and the fact that several nitrogen-containing compounds were tentatively identified in soil samples from this site (Table 1-7-4, borings 12 and 14), EPA feels that more overall discussion and possibly investigation of hydrazines in soil at this site is warranted. Specifically:

- o Additional degradation products may need to be analyzed (list on pages 13-14) to adequately define contamination in the soil.
- o Could the tentatively identified nitrogen-containing compounds be hydrazine oxidation products?

Response:

Except for hydrazines and nitrosamines, the compounds listed in Section 2.0 of this report are quickly oxidized or otherwise unstable in the environment, are quickly biodegraded, or are gases that would dissipate in air rather than entering the soils. Some, such as ammonia and methane, for example, are of little interest. For these reasons, only hydrazines and their relatively more persistent breakdown products, nitrosamines, were included as target analytes in the Phase I program. The other less persistent compounds would have been detected in the nontarget fraction if they had been present at substantial concentrations, but none of them were found.

The groundwater analytical data included in the draft final version of this report were deceptive because the report of hydrazines in the blanks suggests that the hits in the samples were false positives. Analysis of additional samples using

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different methods has shown no hydrazines or nitrosamines in the same wells. These results imply that the site does not act as a source of groundwater contamination by those compounds.

Some of the nitrogen-containing compounds listed in the nontarget results might possibly be products of hydrazines, but the same types of compounds have been tentatively identified at other sites as well, and these compounds were at low concentrations and have low toxicity.

Comment 9:
page 44,
Phase II
Survey

Since arsenic was detected at a concentration exceeding the indicator level in the 4-5 foot sample from Phase I boring 12, the Phase II borings around #12 should be sampled for arsenic to a depth of 10 feet. Also, please clarify the meaning of "STET" shown on Figure 1-7-7 for the 9-10 foot sample from Phase II borings 31, 32, and 33.

Response:

Arsenic was planned to be analyzed but was omitted from the figure through an error. This error has been corrected in the final version of the report. STET is an abbreviation of the editorial term "let it stand" that was inadvertently drafted onto the figure in place of the symbol for arsenic.

STATE OF COLORADO

COLORADO DEPARTMENT OF HEALTH

4210 East 11th Avenue
Denver, Colorado 80220
Phone (303) 320-8333

March 16, 1988



Roy Romer
Governor

Thomas M. Vernon, M.D.
Executive Director

Mr. Donald Campbell
Office of the Program Manager
RMA Contamination Cleanup
AMXRM-EE, Building E4460
Department of the Army
Aberdeen Proving Grounds, Maryland 21010-5401

Re: Task 11, Site 1-7, Hydrazine Blending and Storage
Facility, Contamination Assessment Report

Dear Mr. Campbell:

Enclosed are the State's comments on Task 11, Site 1-7, Hydrazine
Blending and Storage Facility, Contamination Assessment Report.

While the State believes that the Army has made an effort to identify the
contamination in and around the Hydrazine facility, the State has two
principal concerns regarding this CAR. The first concern is that the
Hydrazine Blending and Storage Facility (HBSF) is a RCRA regulated
facility and, therefore, must be closed in accordance with the Colorado
Hazardous Waste Management Act.

The State's second major concern is that the Phase I investigation target
analytes do not include most chemicals known to be used at the HBSF.
This CAR makes clear that one set of target analytes cannot be used for
the entire RMA soils investigation program. Target analytes must be
determined on a site specific basis, and should be dependent upon the
processes used at the site and the chemical compounds used and produced
at the site.

If you have any questions, please contact Mr. Jeff Edson with this
Division.

Sincerely,

A handwritten signature in dark ink, appearing to read "David C. Shelton".

David C. Shelton
Director
Hazardous Materials and
Waste Management Division

DCS:nr

cc: Michael Hopw, Attorney General's Office
Chris Mahn, Shell Oil Company
Connally Mears, U.S. Environmental Protection Agency
David Anderson, Department of Justice
Edward McGrath, Holme, Roberts and Owen
Mike Gaydosh, U.S. Environmental Protection Agency

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As the State is aware, on November 14, 1984, the Army did submit a Part B Permit Application which included a proposed closure plan for the HBSF. Although this proposal was pending before the Colorado Department of Health (CDH) for 3 years and 11 months, CDH took no action with respect to the proposal. On October 14, 1987, Colonel Wallace N. Quintrell, on behalf of the Army, wrote to Mr. David C. Shelton of CDH to inform him that, effective that date, the Army was withdrawing the proposed HBSF closure plan because "there is now no longer any need for action by CDH since [the HBSF] will be remediated as interim and final CERCLA response actions." Thus, the State's claim that the HBSF is RCRA-regulated is without merit. Moreover, this subject is inappropriate for further debate within the context of the technically oriented contamination assessment report portion of the CERCLA remedial investigation on-going at RMA.

To the extent that the State wishes to discuss further its litigation position concerning the State's alleged RCRA/CHWMA jurisdiction with regard to RMA, it should separately transmit such a statement of its views in writing to Mr. David L. Anderson, U.S. Department of Justice, who assures the Army that he will be happy to make a prompt written response. Similarly, to the extent that the State continues to desire any of the information identified in CDH specific comment nos. 3 and 4, it should submit such a request in writing, through the State's counsel, to Mr. Anderson.

In response to the second general comment, the compounds listed in Section 2.0 of this report are quickly oxidized or otherwise unstable in the environment, are quickly biodegraded, or are gases that would dissipate in air rather than entering the soils. Some, such as ammonia and methane, for example, are of little interest. For these reasons, only hydrazines and their relatively more persistent breakdown products, nitrosamines, were included as target analytes in the Phase I program. The other compounds would have been detected in the nontarget fraction if they had been present at substantial concentrations, but none of them were found.

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Comment 1: The Executive Summary states that methyl isobutyl ketone (MIBK), detected in one soil sample from Site 1-7, was introduced at the laboratory during sample preparation and/or during sample analysis. If one part per million (ppm) MIBK indicates laboratory contamination, the laboratory QA/QC program is not working, and laboratory cleanliness appears to be affecting the accuracy of sample evaluations. A study should be done by the Army on the frequency of samples contaminated due to poor sampling and/or laboratory procedures. The EPA QA/QC program recommends that all samples shown to have laboratory induced contamination be resampled and reanalyzed. This process should be followed for all RMA samples for which laboratory induced contamination is suspected.

Response: Because no methylisobutyl ketone was found in the blanks associated with this sample, the statement that this compound might be present due to laboratory contamination has been deleted. However, the Phase II program planned for Site 1-7 already includes three borings around the MIBK hit. This program includes nine samples to be reanalyzed for methylisobutyl ketone compared to the one requested by CDH.

Comment 2: Please give an explanation as to why well number 01052 shows an increase in the ground water level from February 1985 to May 1986.

Pages 11 and 12 state that the HBSF was used from 1962 to 1982 with the last RCRA hazardous waste generated in April 1986. Because this facility generated RCRA hazardous waste after November 1980, it is a RCRA storage facility and therefore must meet all RCRA regulations. RCRA monitoring wells must be placed in and around the HBSF to positively identify what and where the HBSF contributes to ground water contamination.

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Response:

Well 01052 may have a higher water level in May than in February because of recharge to the aquifer. Recharge to aquifers during spring snowmelt is not unexpected in the Rocky Mountain region. Note that all of the wells followed the same pattern.

With regard to the applicability of RCRA to Site 1-7, please see the response to general comments. Also, please note that the area illustrated in Figure 1-7-5 includes three upgradient groundwater monitoring wells (Wells 01054, 01055, and 01056) and seven wells within or downgradient from the site (Wells 01019, 01036, 01051, 01052, 01053, 01701, and 01702).

Comment 3:
page 12

The CAR states that waste hydrazine was shipped to an off site disposal facility. The CAR should indicate whether this was a RCRA hazardous waste facility. The CAR should also indicate how long the waste had been in storage, what the quantity disposed was, and what the predisposal analysis showed as to the constituents of the hazardous waste. Please provide copies of all hazardous waste manifests used for the shipments.

Response:

Please refer to the response to general comments.

Comment 4:
page 12

The CAR states that hydrazine contaminated rinse water is currently in storage at the HBSF. What is the quantity of the RCRA hazardous waste? How long has it been in storage at the HBSF? Was an application for a RCRA permit submitted to CDH prior to treatment? The CAR should include the analytical results of samples taken from the rinse waters. Please explain what is meant by a "facilities decommissioning assessment". Are inspection logs being kept for the stored hazardous waste?

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Response: Please refer to the response to general comments.

The facilities decommissioning assessment is a study of what tasks are involved in dismantling the hydrazine storage and blending facility. This study provides background information for the interim remedial action planned at this site.

Comment 5:
page 13

The CAR states that an unreported quantity of hydrazine sludges were collected, drummed and transported to pits in Section 36. What future plans, and under what task, will the investigation of these pits be conducted? What is the approximate quantity of these wastes?

Response:

The CAR does not state that hydrazine sludges were collected at Site 1-7. It states that calcium carbonate sludges from the destruction of hydrazine were collected, drummed, and transported to Section 36. The quantity of sludge and which pits in Section 36 were used for disposal of the sludge are unknown. Section 36 was investigated under Tasks 1, 14, and 21.

Comment 6:
page 13

The CAR lists chemicals that may have been present at the HBSF. Approximately 25% of the contaminants on that list were analyzed for in soil borings collected during the Phase I investigation. The remaining contaminants must be added to the target list for this site to accurately assess the nature and extent of contamination. Organic vapor readings indicate that organic contamination exists in the HBSF borings. Without doing a complete GC/MS scan and identifying nontarget compounds, these organics cannot be distinguished.

Response:

Except for hydrazines and nitrosamines, the compounds listed in Section 2.0 of this report are quickly oxidized or otherwise unstable in the environment, are quickly biodegraded, or are gases that would dissipate in air rather than entering the soils. Some, such as ammonia and methane, for example, are of little interest.

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For these reasons, only hydrazines and their relatively more persistent breakdown products, nitrosamines, were included as target analytes in the Phase I program. An attempt was already made using GC/MS to identify other compounds in the nontarget fraction of each sample analyzed from Site 1-7, and the results of this GC/MS scan are presented in Table 1-7-4.

Past experience across both source and nonsource areas has demonstrated that organic vapor readings collected in the field have little or no relation to organic contaminants detected in soil samples using certified analytical techniques.

Comment 7:
page 14

The CAR describes contaminated water being pumped into fields east and south of the HBSF east yard. The CAR states that the general area in question was investigated in Task 7, Section 1-UNC. After reviewing the Task 7, Section 1-UNC report, it is apparent that only 1 Phase I boring was placed in the suspected contaminated field. The one boring was a 0-1 and 4-5 foot composite sample. The Task 7 Phase II investigation did not propose that any additional samples be collected in this area. In fact, the Army proposes to call this area "uncontaminated". Unless the Army has sufficient data to positively conclude that this water did not contain any contamination, the nature and extent of all contamination resulting from the pumping of a large quantity of potentially contaminated water onto the ground must be determined.

Response:

The text does not state that the water pumped to the nonsource area of Section 1 was contaminated. It states that water from the fire control system was pumped into nonsource areas of Section 1.

The area to the south of Site 1-7 is included in Site 1-6, open storage area, which was investigated as part of the Section 1 nonsource area. Four additional borings were drilled in Site 1-6 in 1988 and were sampled in the 0 to 1 and 4 to 5 ft intervals. Each sample was

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analyzed for hydrazines and nitrosamines in addition to other analytes. Preliminary (Level 1) data from the four additional borings drilled in Site 1-6 reveal no evidence of hydrazines, nitrosamines, or related compounds. The Level 2 results of this investigation will be reported in a Phase II addendum to the Section 1-UNC Contamination Assessment Report.

Comment 8:
page 14

The CAR describes a flood in the HBSF diked area which resulted in the overflow of potentially contaminated water onto the ground. The CAR states that the water remaining in the diked area was pumped by the fire department. Was this spill reported to the EPA or CDH when it was discovered? What measures were taken to sample and clean up the potentially contaminated soils around and under the diked area? Where was the potentially contaminated soil disposed? Where were the contaminated waters pumped?

Response:

The water that caused the overflow came from the fire sprinkler system and there is no reason to suspect that it was contaminated; therefore, there are no records of whether this flood was reported to the Environmental Protection Agency (EPA) or the Colorado Department of Health (CDH). Since the water was not believed to be contaminated, no cleanup or sampling was conducted. The exact location of where this uncontaminated water was discharged is unknown.

Comment 9:
page 16

See comment #7. Please describe and include all analytical results which show absolute reason to believe that the fire system waters that flooded the diked area were not contaminated. As indicated in the report (page 14), leaking inspection plates located in this area were identified as sources of contamination. This area is not being adequately investigated in Task 7, Section 1-UNC.

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Response: The fire control system water that flooded the diked area was not analyzed. This system was connected to the City of Denver's potable water supply at the time of the flooding. If CDH has any evidence that this fire control system water could have been contaminated, the Army would appreciate receiving a copy of this information.

The area to the south of Site 1-7 is included in Site 1-6, open storage area, which was investigated as part of the Section 1 nonsource area. Four additional borings were drilled in Site 1-6 in 1988 and were sampled in the 0 to 1 and 4 to 5 ft intervals. Each sample was analyzed for hydrazines in addition to other analytes. Preliminary (Level 1) data from the four additional borings drilled in Site 1-6 reveal no evidence of hydrazines or related compounds. The Level 2 results of this

investigation will be reported in a Phase I addendum to the Section 1-UNC Contamination Assessment Report.

Comment 10:
page 18

The CAR describes the contamination found in boring 12; states that elevated readings on the OVA were detected in this boring; and states that no target compounds were detected. The Phase II investigation must analyze for organics and nontargets in this area. This area, along with a majority of site 1-7, must have a complete GC/MS analysis to identify the nature and extent of contamination. The OVA meter indicates that organic vapors are present. However, the Phase I and the proposed Phase II investigations will not adequately identify organic contamination.

Response: The comment that OVA readings were above background during the drilling of Boring 12 and that no target compounds were detected in the Phase I samples accurately restates the information in Sections 3.2.4 and 3.2.5 of the text. In addition, the text states that this boring contained tentatively identified nontarget organics that included benzothiazole in two

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samples above 8.5 feet. However, past experience across both source and nonsource areas has demonstrated that organic vapor readings collected in the field have little or no relation to organic contaminants detected in soil samples using certified analytical techniques. In addition, the Phase II sampling program for this site has always included three borings to be drilled near Boring 12 from which samples were to be analyzed by GC/MS for semivolatile organic compounds. Furthermore, since GC/MS analyses were performed on each sample analyzed in the Phase I program at the site, other areas within the site have already been characterized. Therefore, the purpose of this comment will be satisfied by the Phase I program as it has been conducted and by the Phase II sampling program as it was already planned.

Comment 11:
pages 34-39

The CAR lists a substantial amount of nontarget compounds which must be identified in order to make any adequate conclusions on the contamination in the HBSF area.

Response:

Most of the nontarget compounds detected in the GC/MS analyses have already been tentatively identified. Nontarget compounds are routinely detected and recorded as part of the GC/MS analysis of samples for volatile and semivolatile compounds. GC/MS methods produce a gas chromatogram and a mass spectrum for each separated compound of sufficient concentration. The spectra obtained from the samples are computer compared with those stored in the NBS library database. These spectral identifications are further reviewed by professional GC/MS experts to produce a final tentative identification of a substance based on analytical experience and best fit of the data. Where substantial amounts of these compounds were indicated by the Phase I program (in Borings 4, 12, and 14), Phase II sampling has already been planned to confirm the presence of those compounds and to assess their vertical and lateral extents.

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Comment 12:
pages 34-39

The CAR characterizes unidentified compounds at levels of 5 ppm as "low concentrations". Many chemicals have extremely toxic effects at 5 ppm. Therefore, it is impossible to characterize a 5 ppm "hit" as low until the contaminant has been identified. Please explain how TICs are classified as "low concentrations" or "laboratory induced" and identify the individual who makes this determination.

Response:

Concentrations of a few ppm are characterized as low in Table 1- 7-4, but these compounds are tentatively identified where possible, and low concentrations of some (for example benzothiazole in Boring 12) are included in the proposed Phase II investigation and in calculating volumes of potentially contaminated soil. Therefore, this program in no way uses these comments on low concentrations in place of considering the possible toxicological effects of the compounds in assessing the potential contamination at the site. Comments that some compounds are possible lab contaminants are based on knowledge of what compounds were present in the lab at the time of analysis and on what compounds were present in the blanks associated with the samples. Such laboratory contaminants are commonly detected in conducting sensitive GC/MS analyses, and are recognized as such by the EPA. Laboratory personnel responsible for reporting the analytical results add these and other comments to the table.

Comment 13:
page 43

Boring 10 had high concentrations of an alkane (20 ppm) and freon (4.2 ppm). The CAR states that no Phase II is warranted because: a) the alkane may be from a fuel spill; and f[sic]) freon has only a low toxicity. These reasons should not be the basis for discontinuing further investigations. The nature and extent of contamination should be fully defined regardless of how the contamination occurred or what the toxilological effects of the contaminants are. Therefore, Phase II must include further investigation into these contamiants.

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Response: The alkane and freon tentative identifications will not be pursued further because these compounds, like many others tentatively identified in the nontarget fraction, were believed to be of low toxicity. However, three Phase II borings were already planned around Boring 10 to be sampled for volatile hydrocarbons, and the 4 to 5 foot sample from one of these borings is now planned for GC/MS verification analysis. Also, the boring in which these compounds were tentatively identified in the 0 to 1 and 4 to 5 foot intervals is already included in an area where potential contamination is estimated to extend to a minimum depth of 9 ft because of the presence of methylisobutyl ketone in the 4 to 5 foot interval.

Comment 14:
page 44

The proposed Phase II survey will not accurately define potential contamination at the HBSF. The Phase II investigation should be modified to include the following:

- a) Investigation into the integrity of the floors of the drum storage pad, the concrete berm area around the storage pads, the concrete slab of the blender facility and the waste pit. These areas should be examined for cracks or foundation deterioration. If cracks or deterioration are found, Phase II borings should be placed beneath these structures;
- b) Investigation of the areas where hydrazine contaminated water was pumped after the incidences involving the fire system. These spills were not sufficiently investigated in the Task 7, Section 1-UNC, and must be done because of the large volume of contaminated water involved;
- c) Use of an extraction procedure which assures that hydrazine contamination is detected. The United States Air Force and Martin Marietta have determined that the extraction of hydrazine from soils cannot be done using standard laboratory extraction procedures.

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To accurately determine whether or not hydrazine is present, a mildly acidic extractant must be used, according to the U.S.A.F. and Martin Marietta studies. Therefore, the Phase II investigations should resample and reanalyze the Phase I borings using methods proven to extract hydrazine;

- d) A more complete investigation to define the source of the hydrazine compounds detected in ground water monitoring wells surrounding the HBSF;
- e) Inclusion of the hydrazine fuels, the breakdown products of hydrazine fuels, and related chemicals listed on page 13 of this report as target analytes.
- f) The identification and confirmation of nontarget compounds detected in high concentrations or OVA readings in borings 1, 2, 6, 8, 7, 10, 11, 13, and 15; and
- g) The inclusion of hydrazine compounds and n-nitrosodimethylamine as target analytes in all borings proposed in Phase II investigations. The extraction procedure for these analyses must be adequate, as described in comment number 16 (c).

Response:

- a) Additional site inspection and sampling have now been proposed to be included in a Phase II program. This program may include soils sampling in areas of possible spills, leakage, and overflow. For this program, GC analytical methods with lower detection limits will be developed and certified for hydrazines and nitrosamines, and these analyses will be conducted on samples from 5 ft intervals in the borings. Some of the additional analyses will be conducted on samples from Boring 25 by the loading dock and Boring 29 between the loading dock and drum storage pad. Other borings (38-52) will be drilled near the loading docks, blender, drum filling station, drum cleaning

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shed, drum storage pad, in-ground tank, and west and east yard diked areas around storage tanks. The number, depths, and locations of these borings may be changed according to information that may be obtained from study of aerial photographs and from site inspection. This program may also be revised depending on the interim remedial action developed for this site.

- b) The area to the south of Site 1-7 is included in Site 1-6, open storage area, which was investigated as part of the Section 1 nonsource area. Four additional borings were drilled in Site 1-6 in 1988 and were sampled in the 0 to 1 and 4 to 5 ft intervals. Each sample was analyzed for hydrazines and nitrosamines in addition to other analytes. Preliminary (Level 1) data from the four additional borings drilled in Site 1-6 reveal no evidence of hydrazines, nitrosamines, or related compounds. The Level 2 results of this investigation will be reported in a Phase II addendum to the Section 1-UNC Contamination Assessment Report.
- c) The use of an acidic extractant is and has been a standard laboratory procedure in the Phase I method used to analyze hydrazines in soils at this site. Demonstrating and documenting that this method is capable of detecting hydrazines was part of the USATHAMA certification process. The results of the hydrazines analyses are therefore valid at the detection limits given in Appendix 1-7-B. The Phase II program will, however, include the development and certification of a GC method for hydrazines in soils at lower detection limits for use in analyzing some of the Phase II samples (see Figure 1-7-7).

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COLORADO DEPARTMENT OF HEALTH ON
DRAFT FINAL CONTAMINATION ASSESSMENT REPORT,
SITE 1-7, HYDRAZINE BLENDING AND STORAGE FACILITY

- d) The data in the draft final version of this report that showed hydrazines in all of the wells around Site 1-7 were misleading because hydrazines were also detected in the blanks associated with these samples. The presence of hydrazines in the blanks suggests that although the method may have been capable of detecting hydrazines when they were present, it also could yield false positive results. The reported presence of hydrazines in upgradient wells is further evidence that false positives were reported, as Site 1-7 is the only logical potential source of hydrazines and nitrosamines in this area.

Because of the suspected false positive results from the spectrophotometric method that was used, new gas chromatographic (GC) methods were developed and certified for analyzing hydrazines and nitrosamines in water. The detection limits of the new methods are similar to those of the old ones except for monomethyl hydrazine, for which the detection limit by the gas chromatographic method is 2970 ug/l, compared to 20 ug/l by the older method.

After GC methods were certified, the same wells and an additional downgradient well were resampled in May 1988 and analyzed for hydrazines and nitrosamines using the GC methods. No hydrazines or nitrosamines were detected in any well using the GC methods. These results tend to confirm that the original sampling and analyses yielded false positive results, and imply that Site 1-7 is not acting as a source of groundwater contamination by those compounds.

- e) The components of hydrazine fuels and of the most important, persistent hydrazine breakdown products, nitrosamines, already are included as target compounds for this site. The other compounds listed in Section