

LITIGATION TECHNICAL SUPPORT AND SERVICES

ROCKY MOUNTAIN ARSENAL

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RII

FINAL PHASE I
CONTAMINATION ASSESSMENT REPORT
SITE 30-1: IMPACT AREA
(INCLUDES 30-7: GROUND DISTURBANCE)
(Version 3.3)

January 1988
Contract Number DAAK11-84-D0016
Task Number 14 (Army Sites North)

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.


HARDING LAWSON ASSOCIATES MIDWEST RESEARCH INSTITUTE

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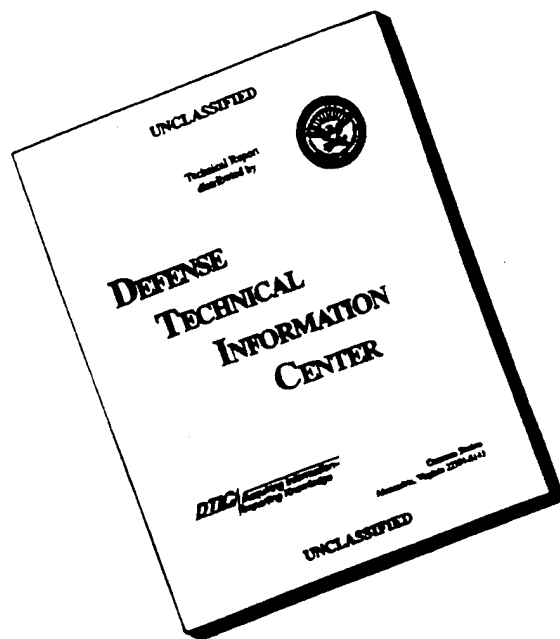
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13. ABSTRACT (Maximum 200 words) THIS FINAL REPORT DOCUMENTS THE PHASE I CONTAMINATION SURVEY OF SITE 30-1, USED FROM 1945 TO 1951 AS AN IMPACT AREA FOR 4.2 INCH MORTARS. 66 SAMPLES FROM 29 BORINGS WERE ANALYZED FOR VOLATILE AND SEMIVOLATILE ORGANICS AND METALS WITH SEPARATE ANALYSES FOR AS AND HG. CU, PB, AND ZN WERE DETECTED ABOVE INDICATOR RANGES; HOWEVER, THESE ELEVATED METAL VALUES ARE ASSOCIATED WITH BEDROCK WHICH CONSISTS OF VOLCANICLASTIC MATERIAL. NO TARGET ORGANIC COMPOUNDS WERE DETECTED. METAL ANOMALIES WERE FOUND AT THE SITE. A PHASE II PROGRAM CONSISTING OF 5 ADDITIONAL BORINGS IS RECOMMENDED TO INVESTIGATE THREE AREAS WHICH HAVE NOT BEEN FULLY INVESTIGATED. THE VOLUME OF POTENTIALLY CONTAMINATED MATERIAL PRESENT IS ESTIMATED AT 70,000 BANK CUBIC YARDS. APPENDICES: CHEMICAL NAMES, PHASE I CHEMICAL DATA, COMMENTS AND RESPONSES.				
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January 1988
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Task Number 14 (Army Sites North)

PREPARED BY

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

Harding Lawson Associates Midwest Research Institute
(Prepared under Task 21)

PREPARED FOR

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

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EXECUTIVE SUMMARY
SITE 30-1: IMPACT AREA

Site 30-1, Impact Area, is in the northeast portion of Rocky Mountain Arsenal (RMA) in Section 30. The site was used as a mortar impact area from 1946 until the early 1950's, although the source of mortar fire is uncertain. This site was investigated under Task 14 in the spring of 1986. A total of 29 soil borings were drilled to depths of 5 to 10 feet (ft) and 66 samples were collected. An extensive geophysical reconnaissance program using magnetic and electromagnetic techniques was performed over the entire site. An additional investigation consisted of surface sweeps for metal debris, test pit excavations for geophysical anomalies, and several borings drilled for geological information.

Four other sites (30-4, 30-5, 30-6, and 30-7) are within the Site 30-1 boundaries. Site 30-7, a ground disturbance of unknown origin, is included in this Site 30-1 investigation. Site 30-4 (Sanitary Landfill) is addressed in a Task 7 investigation. The remaining two sites are addressed in independent Task 14 Contamination Assessment Reports.

Copper, lead, and zinc were the only metals detected at concentrations above their indicator ranges. All other metal values were within or below their respective indicator ranges. Elevated metal values are associated with a well-defined bedrock high which consists, in part, of Tertiary-age volcanoclastic material. No target organic compounds were detected at this site. Several nontarget organic compounds were detected at low concentrations and were tentatively identified as natural organic products, phthalates, and unknown hydrocarbons.

A Phase II program consisting of 5 soil borings (20 samples) is recommended to investigate three areas (a geophysical anomaly, a trench, and a possible burn site) which were not fully investigated by the Phase I investigation. These three areas are estimated to cover 37,500 square feet (ft²) and to contain 8,400 bank cubic yards (bcy) of potentially contaminated soil.

Phase I data and aerial photographs indicate that the main portion of the mortar impact range is in the area of visible impact craters and is estimated to cover 2,100,000 ft² (approximately 1,000 by 2,100 ft). Results also suggest that up to 70,000 bcy of soil in the impact range may be contaminated with a large quantity of small metal pieces and unexploded ordnance (UXO).

SITE 30-1: IMPACT AREA
(Includes 30-7: Ground Disturbance)

1.0 PHYSICAL SETTING

1.1 LOCATION

Site 30-1, the primary impact area for 4.2-inch mortar rounds, comprises most of the southeast corner of Section 30 as shown in Figure 30-1-1. A dirt road in the southeast corner of the section once encircled the site which was considered to be the primary impact range (Geraghty and Miller, 1982, RIC#81342R06; Stout et al., 1982, RIC#83368R01; RMACCPMT, 1984, RIC#84034R01). The following four sites are within and adjacent to Site 30-1:

Site	Description/Activity
30-4	Sanitary landfill
30-5	M-34(GB) Demilitarization area
30-6	M-34 disposal trenches
30-7	Ground disturbance, unknown origin

Sites 30-4, 30-5, and 30-6 are addressed in other Contamination Assessment Reports, while Site 30-7 is included as part of this Site 30-1 Contamination Assessment Report. Because the boundaries for Site 30-1 were not discernible on any aerial photograph, they were derived from the 1984 Rocky Mountain Arsenal Contamination Control Program Management Team map (RMACCPMT) (RIC#84034R01). Visible impact craters were also used to determine the site boundaries.

1.2 GEOLOGY

Site 30-1 is situated on Pleistocene alluvium which consists of interbedded silty sand, gravel, and clay partly covered by a thin layer of eolian silt and sand. The thickness of the alluvium generally varies from 2 to 20 feet (ft), with the thickest portion located along the western boundary near First Creek, in the vicinity of Well 30010 (May, 1982, RIC#82295R01). The eastern portion of the site is located over a bedrock high and has a thin alluvial cover.

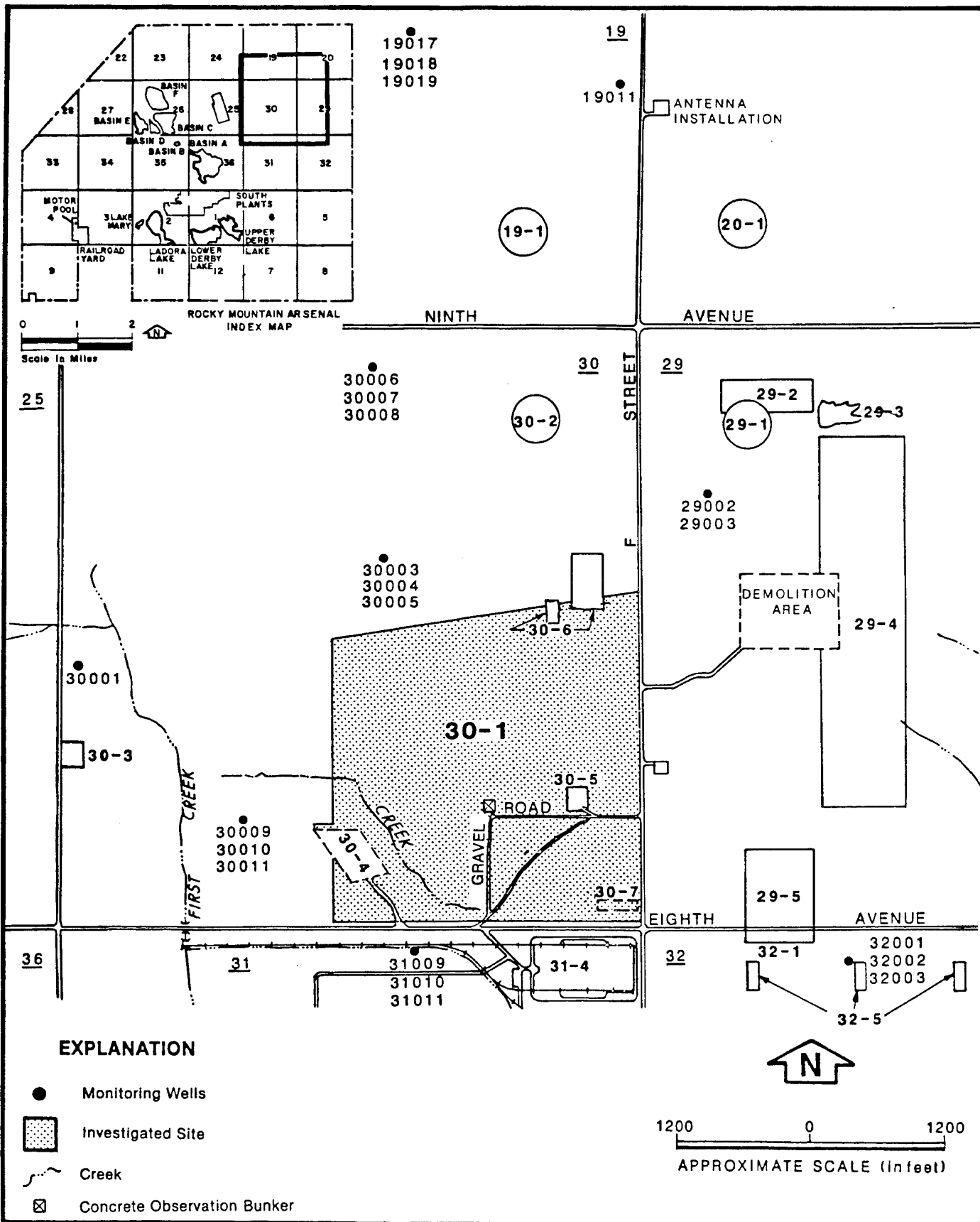


Figure 30-1-1
 SITE LOCATION MAP
 SITE 30-1
 ROCKY MOUNTAIN ARSENAL
 SOURCE: ESE, 1987

Prepared for:
 U.S. Army Program Manager's Office
 For Rocky Mountain Arsenal
 Aberdeen Proving Ground, Maryland

The alluvium is underlain by the Denver Formation which is characterized by bentonite-rich clay/shale and compact lenticular sand horizons. Lithologic variations in the Denver Formation include interbedded siltstone, claystone, sandstone, conglomerate, low-grade coal, lignite, and volcanoclastic material. The sandstone units are as much as 20-ft thick and are typically discontinuous, loosely to poorly cemented, and commonly grade into siltstone or shale. Locally, however, the sands are well-cemented (Stollar and van der Leeden, 1981, RIC#81293R05; Geraghty and Miller, 1982, RIC#81342R06; May, 1982, RIC#82295R01; RMACCPMT, 1983, RIC#83326R01; Clark, 1985, RIC#85183R01; Anderson et al., 1979, RIC#85214R03).

The Phase I boring program investigated the alluvium and bedrock at 29 boring locations. A sandy silt or silty sand interbedded with clayey silt lenses was the dominant soil type encountered. Grain size and sand content generally increased with depth. The Denver Formation was encountered in four borings as follows:

Boring_No.	Depth_(ft)	Lithologies
5334	9	weathered volcanoclastic
5335	6	weathered claystone
5341	5	weathered volcanoclastic
5345	7	weathered volcanoclastic

Borings in Site 30-5, which is within Site 30-1 (Figure 30-1-1), encountered Denver Formation claystone at depths of 3 to 4 ft. Boring logs 5334 and 5335 (Figures 30-1-2 and 30-1-3) are representative of surficial site geology at Site 30-1.

1.3 HYDROLOGY

Site 30-1 is situated in the First Creek drainage basin on a west to southwest-facing slope (Figure 30-1-4). Elevations along the eastern site border (F Street) range from approximately 5,247 to 5,270 ft above mean sea level (ft msl); elevations in the southwest part of the site range from approximately 5,220 to 5,230 ft msl. Surface drainage generally flows west toward First Creek, which is approximately 1,300 ft west of the western site boundary (Figure 30-1-4). Site 30-4 (Sanitary Landfill) lies between Site 30-1 and First Creek and may receive surface runoff from Site 30-1.

A small unnamed drainage channel crosses Site 30-1 from the south boundary and flows northwest toward First Creek (Figure 30-1-4). In a 1964 aerial

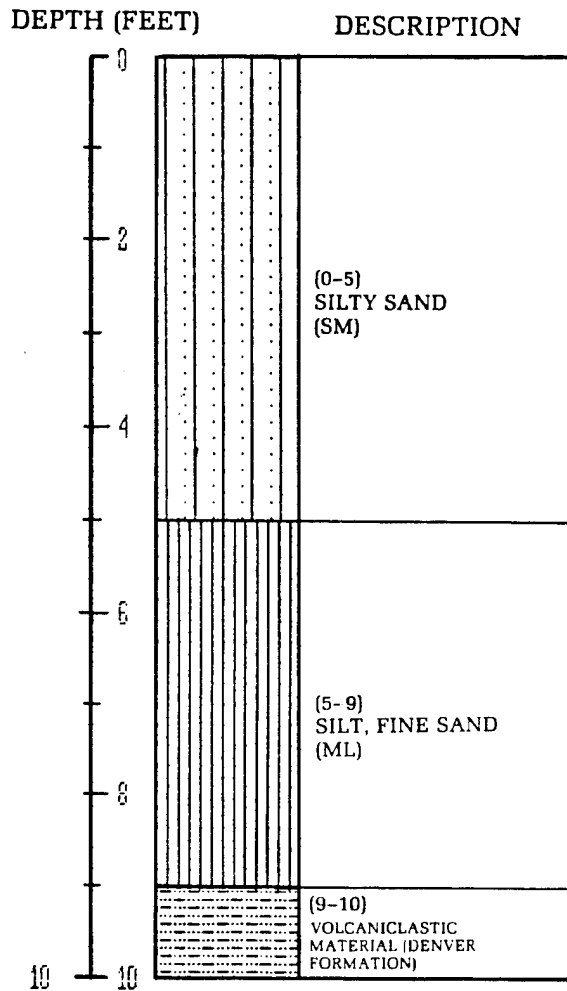


Figure 30-1-2
FIELD BORING PROFILE
FOR BORING 5334
SOURCE: ESE, 1987

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Aberdeen Proving Ground, Maryland

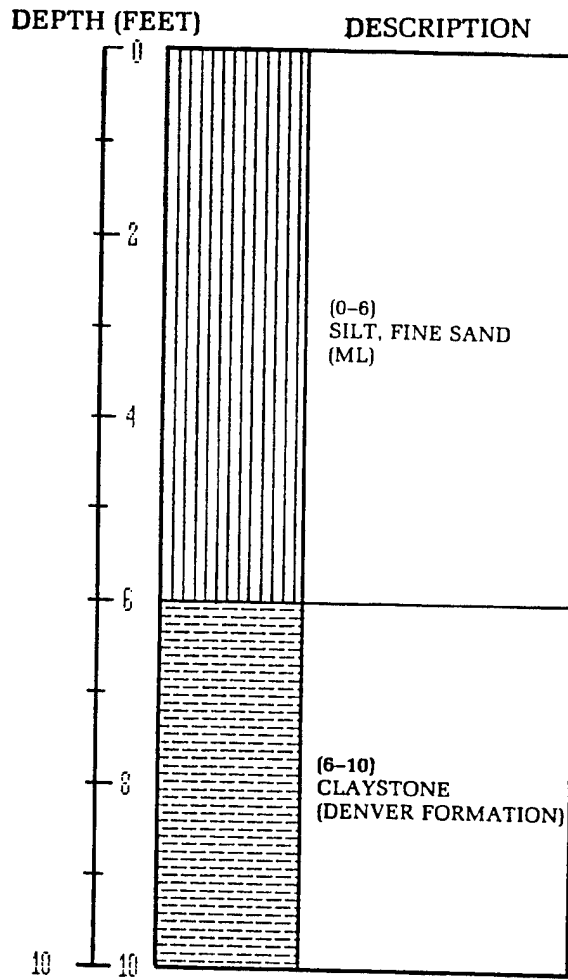


Figure 30-1-3
FIELD BORING PROFILE
FOR BORING 5335

SOURCE: ESE, 1987

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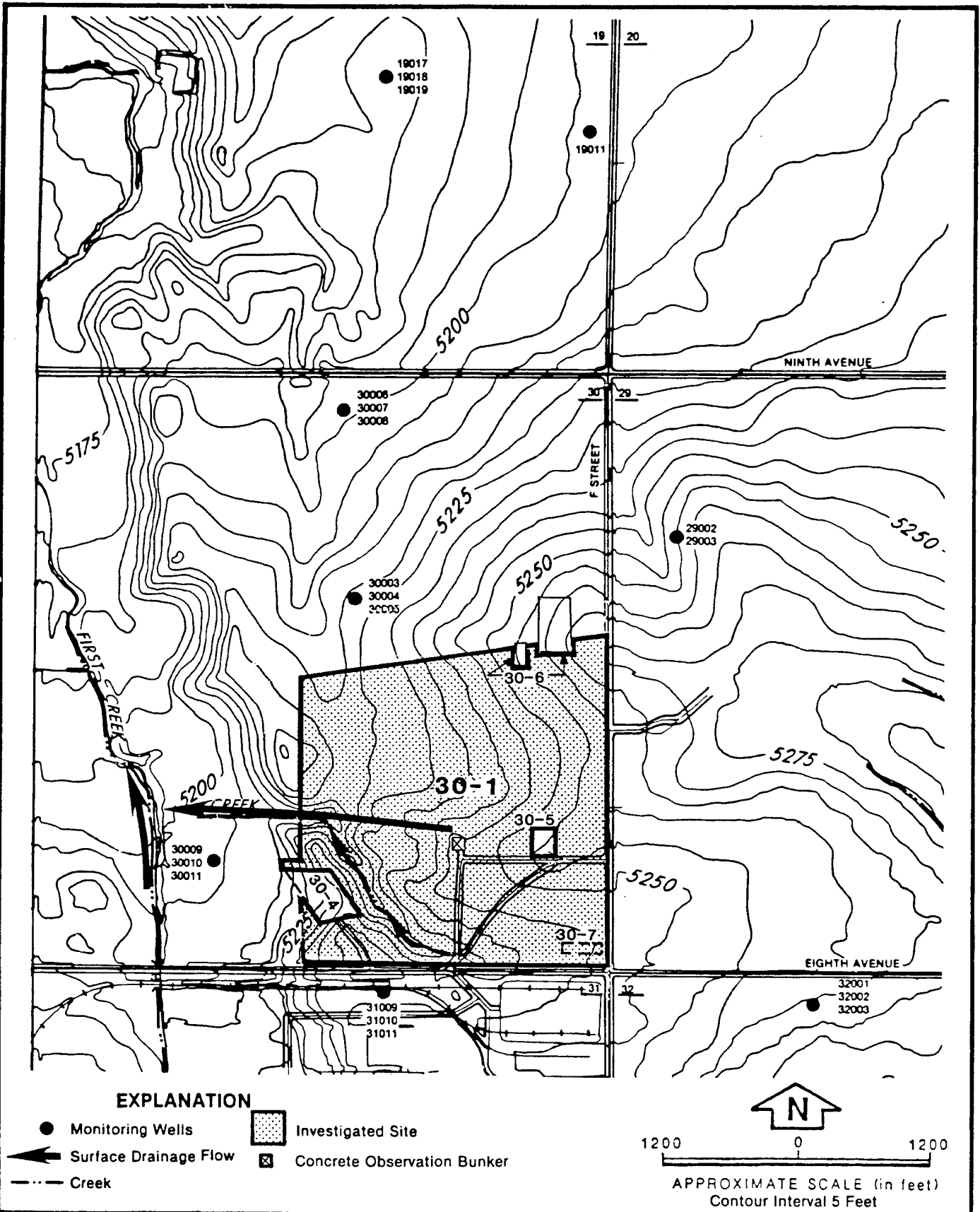


Figure 30-1-4
 REGIONAL TOPOGRAPHY,
 SITE 30-1
 ROCKY MOUNTAIN ARSENAL
 SOURCE: ESE, 1987

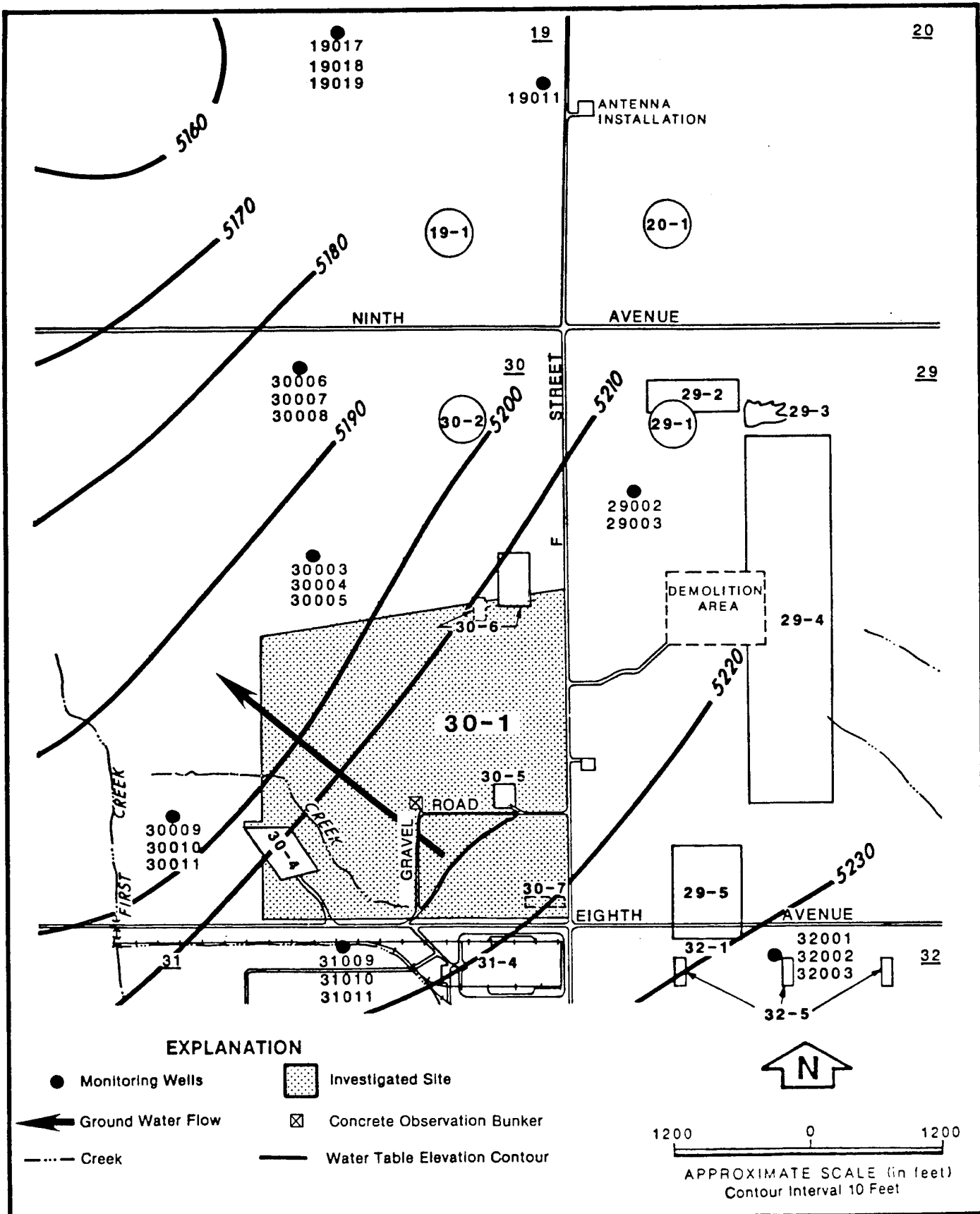
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photograph, liquid was noted in this channel, although it was not entering First Creek (Stout et al., 1982, RIC#83368R01). It is unknown what effect, if any, this small drainage has had on the hydrology of the area.

Most of Section 30 overlies a bedrock high. The water table lies below the alluvial-Denver Formation contact at an elevation of approximately 5,195 to 5,220 ft msl. Available data indicate that the water table occurs within the alluvium only in the southwestern portion of the site (RMACCPMT, 1983, RIC#83326R01).

Water levels measured during the Task 4 Initial Screening Program indicate that wells surrounding Site 30-1 (Figure 30-1-5) have depths to water ranging from 8.5 ft (5,197 ft msl, Well 30009) in the west to 35 ft (5,214 ft msl, Well 29002) in the northeast (ESE, 1986c, RIC#86238R08). Wells to the north (Well 30004) and south (Well 31009) have depth to water measurements of 29.6 (5,195 ft msl) and 27.4 ft (5,214 ft msl), respectively. Ground water flow is generally to the northwest.

Historical data (Clark, 1985, RIC#85183R01) suggest that the water table elevation in this area has varied little over the past 5 years. Phase I borings were drilled to a depth of 10 ft, but did not penetrate the water table. An isolated 10 parts per billion (ppb) endrin value was reported downgradient in Denver Formation Well 30005 (ESE, 1986c, RIC#86238R08). These results, however, are provided for background purposes and are not intended to be correlated with soil sample analytical results generated as part of the Phase I study. It is not possible to determine on the basis of available data if activities at Site 30-1 have affected ground water beneath this site.



2.0 HISTORY

Section 30 was part of the original buffer zone for RMA operations from 1945 until 1951, when the RMA boundary was moved east to its present location. From 1945 to 1951, Site 30-1 was reportedly used as an impact range for 4.2-inch mortars (Wingfield, 1977, RIC#81266R68). Several resources describe the impact range differently. One drawing illustrates that areas of Sections 26, 35, 25, 36, 30, 31, 29 and 32 were part of the mortar range (RMA, 1946). Four observation posts were associated with the reported mortar range, one which was located atop Rattlesnake Hill in Section 35, one atop the hill on Eighth Avenue between D and E streets in Section 25, one at the intersection of E Street and Eighth Avenue, and a concrete bunker in Section 30 (U.S. Army Chemical Corps, 1945; U.S. Army Chemical Corps, 1946). The 1949 aerial photograph of Section 30 shows a dirt road in the southeast section corner that encircles an area considered to be the primary impact range (Geraghty and Miller, 1982, RIC#81342R06).

The Installation Assessment Report (Wingfield, 1977, RIC#81266R68) suggests that the impact area includes the northeast corner of Section 30 and the adjacent areas of Sections 19, 20, and 29. This location appears unlikely, however, since Sections 19 and 20 were outside the RMA boundary in the late 1940's (Geraghty and Miller, 1982, RIC#81342R06). Although 4.2-inch mortar fragments have been found in the south-central portion of Section 30, no fragments have been found in the northeast portion of the section (Wingfield, 1977, RIC#81266R68).

A concrete bunker, used to observe mortar impacts, is located near the center of the site. Windows in the bunker are present only on the north and west sides, suggesting that the main impact range was north of the bunker. The ground disturbance identified as Site 30-7 in the southeast corner of Site 30-1, was located on a 1958 aerial photograph, but its history is unknown (RMACCPMT, 1984, RIC#84034R01). It is unlikely that Site 30-7 was in the Section 30 impact range due to its proximity to the southeast section corner. The 1958 aerial photograph does show a trench at Site 30-7 (Stout et al., 1982, RIC#83368R01), although no information is available on what,

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if anything, may have been disposed of in the trench. Drawing D-748 and pre-Arsenal aerial photographs indicate a farming silo once stood directly adjacent to F Street, just northeast of Site 30-5.

U.S. Army Technical Escort Center (TEC) personnel have indicated that the maximum penetration depth for 4.2-inch mortars is 8 ft. Six ft is considered a conservative average for subsurface dud rounds (RMACCPMT, 1984, RIC#84034R01). Explosive chemicals contained within mortar shells should detonate upon impact leaving little or no contamination. Soil contamination from UXO is expected to be minimal at this site (Geraghty and Miller, 1982, RIC#81342R06).

Site 30-1 is suspected of being contaminated with organic, inorganic, and heavy metal contaminants, in addition to UXO (RMACCPMT, 1984, RIC#84034R01). The soil is believed to contain scrap metal fragments from 4.2-inch mortar impacts and 4.2-inch unexploded rounds which may contain high explosive (HE), white phosphorus (WP), smoke (FS) filler, or slugs (Wingfield, 1977, RIC#81266R68; Geraghty and Miller, 1982, RIC#81342R06).

The available aerial photographs (Stout et al., 1982, RIC#83368R01) may be summarized as follows:

<u>Photograph Date</u>	<u>Description</u>
October 21, 1948	Only the westernmost portion of the site is shown in this photograph. The photograph clearly shows a dirt road extending north from Eighth Avenue for approximately one-half mile, then turning east-northeast and eventually intersecting F Street. This road defines the western and northern margins of Site 30-1.
October 15, 1964	The road described above is still clearly visible in this photograph and the observation bunker is present. The access road to the demilitarization operation (Site 30-5) is now clearly visible, as are the trenches comprising Sites 30-6 and 30-7. A north-northeast dirt track leading from the observation bunker near the center of Site 30-1 to the vicinity of Site 30-6 is also visible in this photograph. A light-colored, small rectangular

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area thought to be remains of a farming silo is clearly shown northeast of Site 30-5 and directly adjacent to F Street. Four light gray scars approximately 90 ft in diameter are visible in this photograph. Two scars are west and two are approximately 1,200 ft northwest of Site 30-6. The scars are not thought to be related to Site 30-1 activities. All of the scars are north of the designated site.

April 28, 1974

The dirt roads and tracks described in the 1964 photograph are still visible, although some are faint. The rectangular area of unknown origin northeast of Site 30-5 now appears to be a blackened, possible burn area. The sanitary landfill (Site 30-4) is clearly defined near the southwest corner of Site 30-1. The northwest portion of the site has a light-colored ground scar which may be related to impact craters located directly north.

September 20, 1980

The sanitary landfill (Site 30-4) has been expanded to the northwest and has obscured the north-south road which once defined the western margin of Site 30-1. Brackets are drawn on the photograph which distinguish the boundaries of the old and new landfills. The blackened area east-northeast of the demilitarization operation is still well-defined. Impact craters are now visible in the northwest quadrant of the site. Many impact craters are visible to the north and northwest of Site 30-5 as well. Two trenches oriented northwest-southeast are visible in the southwest portion of the site, east of the landfill access road.

December 31, 1985

A long, thin, apparently shallow excavation is west-northwest of the demilitarization operation in this photograph. Another similar excavation is 400 ft north of the observation bunker. Several east-west linear berms are in the southeast quadrant of the site. The southwest portion of the site east of the landfill access road appears irregular and hilly.

The fact that many visible impact craters occur in the north-central part of the site does not fully correspond with the 1977 Records Evaluation Report (Wingfield, 1977, RIC#81266R68), which shows the impact range extending northeast across Section 30 and into Sections 19, 20, and 29. Mr. William

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Moloney (Quality Assurance, RMA) has suggested that the impact range is north of the observation bunker (Figure 30-1-1) and doubts that the GB demilitarization facility (Site 30-5) would have been constructed on any part of the impact range. Windows in the observation bunker only face north and west; thus, it is unlikely that mortars were intentionally fired to the southern and eastern parts of Section 30, beyond the effective view of the observation bunker.

3.0 SITE INVESTIGATION

3.1. PREVIOUS SOIL INVESTIGATIONS

The soil at Site 30-1 has been mapped by the U.S. Soil Conservation Service (Sampson and Baber, 1974) as Ascalon sandy loam, Ascalon-Vona sandy loam, and Platner loam. Ascalon soil is sandy loam containing varying amounts of sand and gravel which become clay-rich and calcareous with depth. Ascalon-Vona soil is somewhat sandier than Ascalon soil and is better drained. Soil of the Platner loam series is typically gray-brown, noncalcareous, silty loam which becomes more clay-rich and calcareous with depth. No previous soil contamination studies are documented for this site.

3.2 PHASE I SURVEY

3.2.1 Phase I Program

The Phase I program consisted of an extensive geophysical survey and a soil boring program which was intended to locate large-scale burial sites or anomalous soil conditions. Twenty-nine soil borings yielding 66 soil bedrock samples were drilled at an average spacing of 450 ft over this 7,219,000 ft² site. Twenty-one borings were drilled to a depth of 5 ft, and eight borings were drilled to 10 ft. Four borings (5334, 5335, 5341, and 5345) encountered claystone bedrock. The 29 Phase I borings were drilled as follows:

<u>Boring Number</u>	<u>Depth (ft)</u>	<u>Number of Samples</u>
5325	5	2
5326	10	3
5327	5	2
5328	5	2
5329	5	2
5330	5	2
5331	5	2
5332	5	2
5333	10	3
5334	10	3
5335	10	3
5336	5	2
5337	5	2
5338	5	2
5339	5	2
5340	5	2
5341	10	3

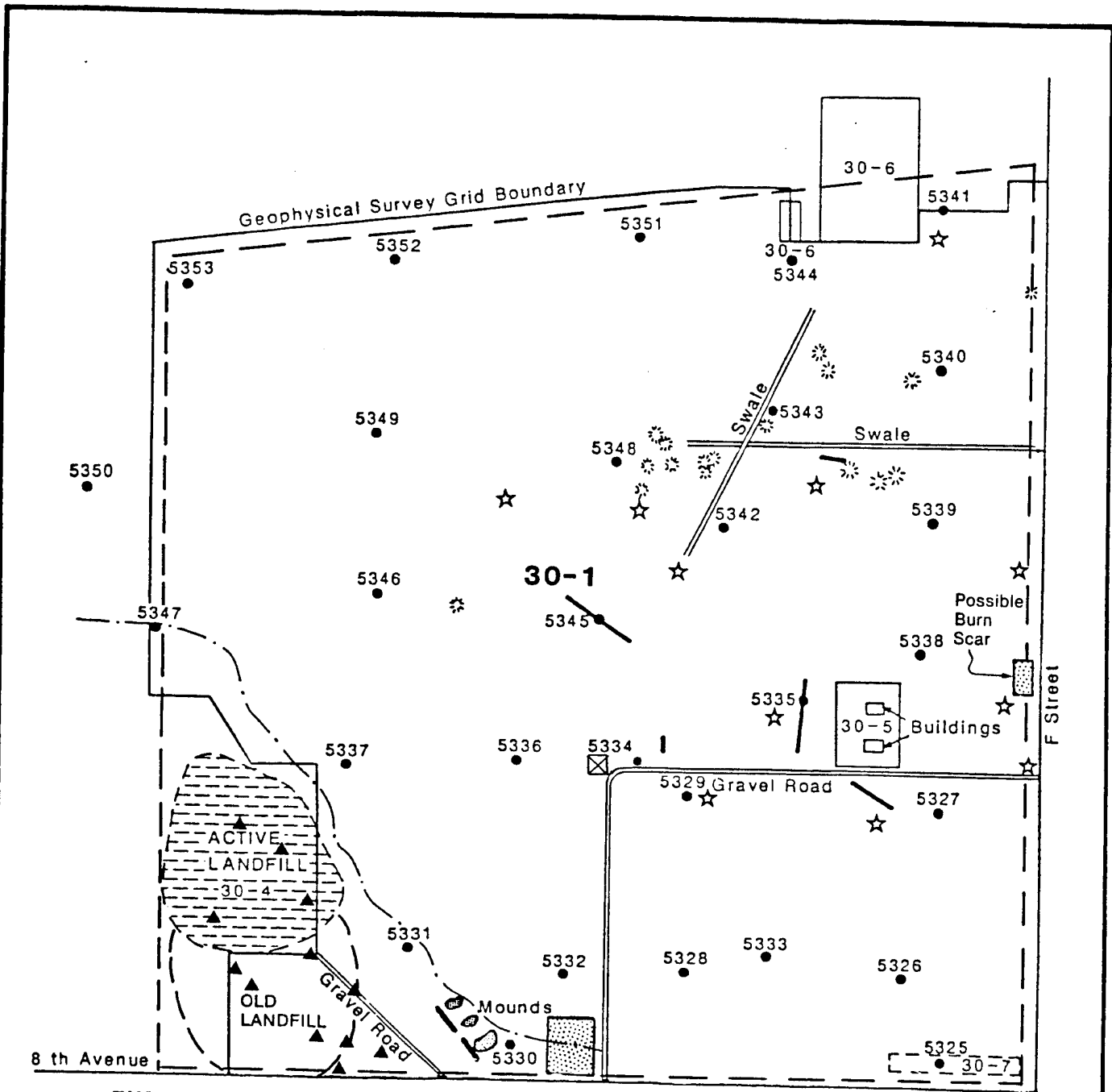
5342	5	2
5343	5	2
5344	5	2
5345	10	3
5346	5	2
5347	5	2
5348	10	3
5349	5	2
5350	10	3
5351	5	2
5352	5	2
5353	5	2
	TOTAL	66

During the geophysical investigation of this site, an anomalous response area was identified south of Site 30-4. This was determined to be the old Sanitary Landfill, and was referred to Task 7 for investigation. Six soil borings were placed in this area under Task 7.

The geophysical program at this site also indicated widespread magnetic and electromagnetic response on the eastern and northern portions of the site. Seven borings were drilled and a pit was dug to provide more information on the anomalous responses. Two surface sweeps for metal debris characterization were also conducted; one within the primary impact area and another in an area of abundant metal debris near Eighth Avenue.

Soil samples were collected using the continuous soil sampling method detailed in the Task 14 Technical Plan (ESE, 1986b, RIC #86238R04). Samples were obtained at predetermined intervals unless field conditions [i.e., water table, staining, etc.] required an adjustment in the intervals. No adjustment was required in intervals from Site 30-1 borings.

Boring locations, pertinent surficial objects, and historical features from aerial photographs have been combined and presented on the boring location map (Figure 30-1-6). Borehole sites were selected on the basis of visual evidence, historical reports, aerial photographs, and geophysical results. Boring 5325 was located within the boundaries of Site 30-7; all other borings were situated in Site 30-1.



EXPLANATION

- Abundant Metal Debris
- Impact Crater
- Road or Swale
- Trench
- Large Pieces of Metal
- Concrete Observation Bunker
- Phase I Boring
- RMACCPMT Boundary(1984, RIC No.84034R01)
- EBASCO Soil Boring Location
- Creek or Ditch

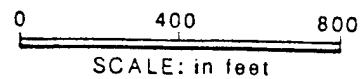


Figure 30-1-6
 PHASE I INVESTIGATION
 BORING LOCATION MAP
 SITE 30-1

SOURCE: HARDING LAWSON ASSOCIATES, 1987

Prepared for:
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 For Rocky Mountain Arsenal
 Aberdeen Proving Ground, Maryland

Prior to drilling, all borehole sites were cleared for safety purposes in accordance with the geophysical program detailed in the Task 14 Technical Plan (ESE, 1986b, RIC#86238R04). Borehole site clearance was used to ensure drilling would not encounter buried UXO or other metal that could pose a significant safety risk. Magnetic intensity readings were obtained with a gradiometer. A 20-ft-square grid was centered at each boring location, and gradiometer readings were obtained at a spacing of 5 ft throughout the area. A contour map was prepared from the data and used to place the boring in the safest location within the geophysical plot. Following borehole clearance with the gradiometer, a metal detector was used to check for surficial (0 to 2 ft) metal which may have presented a safety risk. Twenty-two borings were relocated slightly due to borehole site clearance. This procedure should not be confused with the geophysical exploration program outlined in Section 3.2.3 of this report.

A photoionization detector (PID), calibrated to an isobutylene standard, was used to obtain readings from the open boreholes during drilling and from soil samples during geologic logging. The PID measures the concentration of organic vapors in the air and is a method of ensuring personnel safety.

All samples were analyzed by gas chromatography/mass spectrometry (GC/MS) for semivolatile organic compounds and by inductively-coupled argon plasma (ICP) analyses for cadmium, chromium, copper, lead, and zinc. All samples were analyzed for arsenic and mercury by atomic absorption (AA) spectroscopy. A GC/MS volatile organic analysis was performed on five samples from the 9- to 10-ft interval as follows: 5326, 5334, 5335, 5345, and 5348. A complete list of the Phase I analytes is in Appendix 30-1-A.

The Phase I remedial investigation program for this site was developed and implemented based on historical 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 impact 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 program was designed does not substantially alter the view of potential contamination at this site. As a result, the Phase I program as conducted and Phase II program as planned is judged to provide a complete and accurate investigation of the possible contamination at this site.

3.2.2 Phase I Field Observations

Several linear surface scars were noted at Site 30-1. Boring 5345 was drilled in a 175- by 30-ft-wide trench oriented northwest-southeast, Boring 5335 was also drilled in a trench, and Boring 5334 was drilled in a ditch beside a gravel road running east-west. No indications of disposal activity were present in any borehole sample from these trenches, nor were any surface indications of disposal noted. Boring 5347 was placed within a small drainage channel in the western portion of the site.

Several depressions (impact craters) were noted within the site (Figure 30-1-6). Most depressions were small and shallow (6 ft wide by 3 ft deep). A general field search in the northern part of the site near Borings 5345, 5348, 5342, and 5343 revealed an abundant number of small pieces of shrapnel associated with these impact craters. Most metal pieces were only 1 to 2 inches square in size, but occasionally they were 1 ft². Only a few pieces of shrapnel were found over a 3,000 ft² area along the northern site boundary approximately 1,000 ft west of Site 30-6. A second field search of a 2,300 ft² area was conducted within a broad zone of intense geophysical anomalies 300 ft southwest of Site 30-5. Only 20 small pieces of metal were found, most of which were 2- to 4-inch-long, pencil-shaped fragments. The quantity of metal in the general area southwest of Site 30-5 is estimated to be 5 to 10 times less than that found in the north-central portion of Site 30-1.

A 1-acre area within the primary impact area was staked and a surface sweep was conducted. Personnel with expertise in UXO identification recovered 14 fuzes, 20 blasting caps, two 40mm grenades, and 1 dud smoke grenade from the area. The items were stored in a magazine for future detonation. A second

surface sweep was conducted in an area of abundant metal debris near Eighth Avenue. Material identified in this area was innocuous scrap metal that did not warrant further investigation.

A 100- by 200-ft area along F Street was described as a possible burn scar by Stout et al. (1982, RIC#83368R01). A field search of this area revealed abundant pieces of red brick, building tile, and concrete. The June 4, 1978 Drawing D-748, "4.2 inch Mortar Range", and pre-Arsenal aerial photographs indicate this to be the location of an agricultural-use silo. The area contained scattered small cans and abundant metal, although there was no surface evidence to suggest burning occurred in this area. The red brick and tile are thought to be the silo remains. The area, as mapped by the geophysical field crew, contained abundant scattered metal (Figure 30-1-6).

Boring 5345 contained visible staining in the 9- to 10-ft interval. Green specks and spots were noted in this sample, but no unusual field readings were detected.

An M8 alarm and M18A2 test kit were used to detect the presence of chemical agents in boreholes and soil samples. The M8 alarm is used to detect GB (Sarin) and VX at detection levels of 0.2 and 0.4 milligrams per cubic meter (mg/m^3) respectively, after a response time of 2 to 3 minutes [U.S. Army Materiel Development and Readiness Command (USAMDARC), 1982; USAMDARC, 1979; Headquarters-Department of the Army (HDOA), 1976]. However, many other substances, including smoke and engine exhaust, can activate the M8 alarm. 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 (L), based upon the knowledge that these agents were manufactured, stored, or demilitarized at the site (HDOA, 1976). The detection limit for mustard agents is 0.5 milligrams per cubic meter (mg/m^3) and the detection for GB is 0.2 mg/m^3 . The detection limit for L in soil is 5 parts per million (ppm).

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Historical evidence did not support further testing for chemical agents at this site. No positive tests or alarm activation occurred at this site. PID readings for this site were less than 2.3 and posed no risk to drilling personnel.

3.2.3 Geophysical Exploration

The two geophysical methods used in this Task 14 investigation included continuous magnetic surveying with a Geonics G-866, which measures minute changes in the earth's magnetic field, and continuous electromagnetic (EM) surveying with a Geonics EM-31D, which measures both in-phase and out-of-phase EM response.

Geophysics is an indirect technique that measures the electrical/physical properties of an object or lithology. Geophysical anomalies may be related to buried metal or to lithologic variations and/or depth to bedrock. The correct interpretation of geophysical data is dependent upon experience and extensive site knowledge to identify anomalies induced by debris or contaminant plumes.

Within the limitations inherent in the methods, the geophysical data obtained in this investigation can be used to infer the presence of metals or chemical contamination. Whereas the magnetic technique is sensitive to the presence of ferrous metal, in-phase EM techniques can be used to detect both ferrous and nonferrous metal. Out-of-phase EM techniques provide information regarding bulk soil conductivity and the possible presence of chemical contamination.

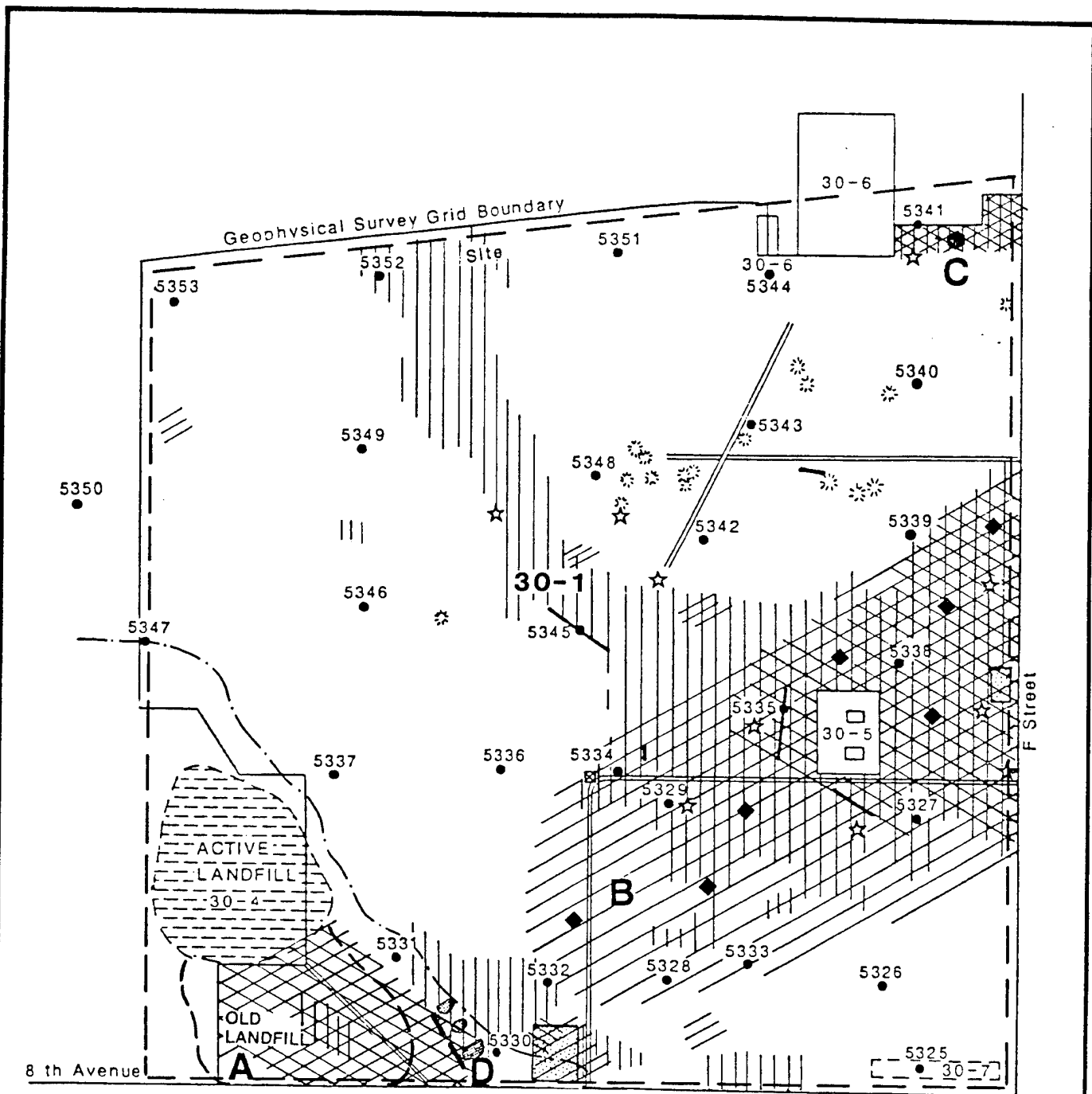
The geophysical survey consisted of alternating magnetic and EM lines spaced 25 ft apart. Continuous geophysical readings were taken along each traverse and stored on computer tape. Three individual contour maps were generated from the magnetic, EM in-phase, and EM out-of-phase data. Areas of anomalous geophysical response were noted for each map and used to produce a geophysical results summary map.

Results from the magnetometer and EM survey are summarized in Figure 30-1-7. The three major areas of magnetic anomalies and their locations are: Anomaly A, southwest corner; Anomaly B, southeastern to eastern portion of the site; and Anomaly C, northeast corner. Anomaly A coincides with a very strong in-phase EM response and defines the old landfill. Anomaly B is defined by numerous magnetic anomalies; the eastern one-half to one-third portion of this anomaly also contains abundant in-phase EM anomalies. Seven borings drilled in this area were logged for geologic characteristics and revealed volcanoclastic material (indicative of bedrock) at depths from 3 to 10 ft. The magnetic and electromagnetic response are attributed to the Denver Formation bedrock. Anomaly C extends beyond the northern geophysical survey grid boundary and consists of strong magnetic, in-phase EM, and out-of-phase EM anomalies. Anomaly C was investigated by an excavation pit in which shallow volcanoclastic material was also identified.

The geophysical survey was designed to detect large accumulations of metal buried in trenches or pits. Widely scattered pieces of shrapnel associated with mortar impacts are not detectable. Because the scattered magnetic anomalies shown on Figure 30-1-7 are not supported by accompanying in-phase EM anomalies, these small isolated magnetic anomalies probably represent shallow metal debris or localized bedrock anomalies.

A large curving band of out-of-phase EM anomalies extends from the northern to the eastern geophysical survey grid boundary. These anomalies are thought to be related to soil texture and/or moisture content. A second area of out-of-phase EM anomalies occurs in the southwest corner of the site just northeast of the old landfill area. The strongest portion of this anomaly (D) appears to be related to two small trenches and mounds west of Borehole 5330. In-phase EM values are also anomalous in this area, but are related to both the old landfill location and the two trenches and mounds.

An out-of-phase EM anomaly coincides with the north-south oriented trench west of Site 30-5. Although this trench is within the curving out-of-phase EM anomaly described above, greater intensities were measured by all three geophysical techniques in the immediate vicinity of the trench.



EXPLANATION

- | | | | |
|-----------------------------|----------------|---|----------|
| Abundant Metal Debris | Mounds | RMACCPMT Boundary (1984, RIC #84034R01) | N |
| Impact Crater | Excavation Pit | Geophysical Anomalies | |
| Road or Swale | Creek or Ditch | | Magnetic |
| Trench | Phase I Boring | Inphase EM | |
| Large Piece of Metal | Geology Boring | Out-Of-Phase EM | |
| Concrete Observation Bunker | | | |

Figure 30-1-7
 PHASE I INVESTIGATION,
 GEOPHYSICAL RESULTS SUMMARY
 SITE 30-1,

SOURCE: HARDING LAWSON ASSOCIATES, 1987

Prepared for:
 U.S. Army Program Manager's Office
 For Rocky Mountain Arsenal
 Aberdeen Proving Ground, Maryland

3.2.4 Phase I Analyte Levels and Distribution

A statistical summary of Phase I analytical results is presented in Table 30-1-1. An analytical summary for each sample, including lithology and air monitoring results, is presented in Table 30-1-2. A listing of the target compounds and a tabulation of analytical data can be found in Appendices 30-1-A and 30-1-B.

To assess the significance of metal and organic analytical values, indicator ranges were established. For organic compounds, the indicator level is the method detection limit. For metals, a range of values was chosen to reflect the upper end of the normal range for each metal as naturally found in RMA alluvial soils. Selection of the ranges is discussed in the Introduction to the Contamination Assessment Reports (ESE, 1986a). Concentrations within and above indicator range for Phase I data are presented in Figure 30-1-8.

Most metal concentrations at this site are within their respective indicator ranges, except for samples near or from bedrock. Copper, zinc, and lead were the only metals found at concentrations exceeding their indicator ranges. Mercury was detected in two samples at 0.066 and 0.082 ppm, and arsenic was detected in 14 samples from 5.5 to 7.4 ppm. Cadmium was below the detection limit in all samples.

Six borings (5334, 5335, 5338, 5341, 5345, and 5352) contained metal concentrations above the indicator ranges. All six borings were situated in areas of high inferred soil conductivity and relatively shallow bedrock (Figure 30-1-7). Four of these borings (5334, 5335, 5341, and 5345) encountered weathered bedrock (volcaniclastics) at depths of 5- to 9-ft. Boring 5338 penetrated a stiff-textured silty clay horizon that may actually be weathered bedrock. The remaining boring (5352) contained brownish-clay silt, which may indicate a relatively higher organic content. The elevated organic content could be responsible for concentrating certain metals (Krauskopf, 1979). Target organic compounds were not detected in any of the 66 Phase I samples (Table 30-1-1).

Table 30-1-1. Summary of Analytical Results for Site 30-1

Constituent	Number of Samples*	Concentrations (µg/g)							Indicator Range
		Range	Mean	Median	Standard Deviation	ESE Detection Limit	MRI Detection Limit		
Volatiles (N=5)†									
None Detected									
Semivolatiles (N=66)†									
None Detected									
ICP Metals (N=66)†									
Cadmium	0	--	--	--	--	0.90	0.50	DL-2.0	
Chromium	57	8.1-25	15	16	3.8	7.2	7.4	25-40	
Copper	66	5.8-58	17	14	9.7	4.8	4.9	20-35	
Lead	36	20-41	28	28	5.2	17	16	25-40	
Zinc	65	26-110	56	54	17	16	28	60-80	
Arsenic (N=66)†	14	5.5-7.4	6.3	6.3	.54	4.7	5.2	DL-10	
Mercury (N=66)†	2	0.066-0.082	--	--	--	0.050	0.070	DL-0.10	

* Number of samples in which constituent was detected above the detection limits.

† N = Number of samples analyzed.

-- Not calculated for less than five detections.

DL Detection limit.

Source: ESE, 1987.

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 1 of 6)

Bore Number	5325	5325	5326	5326	5327	5327	5328	5328	5329	5329	5330	5330
Depth (ft)	0-1	4-5	0-1	9-10	0-1	4-5	0-1	4-5	4-5	0-1	0-1	4-5
Geologic Material	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt

AIR MONITORING

PID*	BKD	BKD	BKD	BKD	BKD	BKD	BKD	BKD	BKD	BKD	BKD	BKD
	NA	NA	BDL	BDL	NA	NA	NA	1.8	NA	NA	NA	NA

SOIL CHEMISTRY

Volatiles (µg/g)

Semivolatiles (µg/g)

None Detected

Metals (µg/g)

Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	20	14	19	9.4	16	13	17	14	18	9.9	14	BDL
Copper	14	12	14	8.2	16	13	13	9.1	29	29	10	31
Lead	32	20	34	BDL	24	24	30	BDL	29	32	26	BDL
Zinc	59	47	60	32	53	47	53	34	54	77	59	60
Arsenic (µg/g)	BDL	5.8	7.1	BDL	7.4	6.8	BDL	BDL	BDL	BDL	BDL	BDL
Mercury (µg/g)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 3 of 6)

Bore Number	5336	5337	5337	5338	5338	5339	5339	5340	5340	5341	5341	5341
Depth (ft)	0-1	0-1	4-5	0-1	4-5	0-1	4-5	0-1	4-5	0-1	4-5	9-10
Geologic Material	Slightly Clayey Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Weathered Volcanic-clastic
AIR MONITORING												
PID*	BKD	BKD	BKD	BKD	BKD	0.7	BKD	BKD	BKD	BKD	BKD	BKD
SOIL CHEMISTRY												
<u>Volatiles (µg/g)</u>	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<u>Semivolatiles (µg/g)</u>												
None Detected												
<u>Metals (µg/g)</u>												
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	16	9.9	14	15	BDL	18	16	18	16	21	12	13
Copper	18	13	13	14	15	15	15	14	14	24	51	58
Lead	21	BDL	BDL	26	29	30	28	32	28	BDL	BDL	26
Zinc	60	37	48	52	88	58	56	56	56	69	110	89
<u>Arsenic (µg/g)</u>	BDL	BDL	BDL	5.3	BDL	BDL	BDL	BDL	6.3	BDL	BDL	BDL
<u>Mercury (µg/g)</u>	BDL	BDL	BDL	BDL	0.066	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 4 of 6)

Bole Number	5342	5342	5343	5344	5344	5345	5345	5346	5346	5347	5347
Depth (ft)	0-1	4-5	0-1	4-5	4-5	0-1	4-5	0-1	4-5	0-1	4-5
Geologic Material	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Slightly Clayey Silt	Clayey Silt
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	9.4	12	16	20	20	16	39	10	10	9.6	16
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	42	50	33	68	54	50	92	35	42	33	58
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	0.066	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	0.082	BDL	BDL	BDL	BDL	BDL	BDL

AIR MONITORING

PID#

SOIL CHEMISTRY
Volatiles (µg/g)

Semivolatiles (µg/g)

None Detected

Metals (µg/g)

Cadmium
Chromium
Copper
Lead
Zinc

Arsenic (µg/g)

Mercury (µg/g)

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 5 of 6)

Bore Number	5348	5348	5348	5349	5350	5350	5350
Depth (ft)	0-1	4-5	9-10	0-1	0-1	4-5	9-10
Geologic Material	Sandy Silt	Sandy Silt	Silty Sand	Slightly Clayey Silt	Slightly Clayey Silt	Sandy Silt	Sandy Silt
	BKD	BKD	BKD	BKD	1.1	BKD	BKD
AIR MONITORING							
PID*	BKD	BKD	BKD	BKD	1.1	BKD	BKD
SOIL CHEMISTRY							
Volatiles (µg/g)	NA	NA	BDL	NA	NA	NA	NA
Semivolatiles (µg/g)							
None Detected							
Metals (µg/g)							
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	17	11	9.4	14	22	14	11
Copper	17	13	18	18	13	10	7.8
Lead	29	21	BDL	BDL	33	21	BDL
Zinc	58	42	74	50	61	44	32
Arsenic (µg/g)	BDL	BDL	BDL	BDL	6.5	BDL	BDL
Mercury (µg/g)	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 6 of 6)

Bore Number	5351	5351	5352	5352	5353	5353
Depth (ft)	0-1	4-5	0-1	4-5	0-1	4-5
Geologic Material	Sandy Silt	Silty Sand	Clayey Silt	Clayey Silt	Sandy Silt	Sandy Silt
AIR MONITORING						
PID*	1.5	1.9	BKD	BKD	BKD	BKD
SOIL CHEMISTRY						
<u>Volatiles (µg/g)</u>	NA	NA	NA	NA	NA	NA
<u>Semivolatiles (µg/g)</u>						
None Detected						
<u>Metals (µg/g)</u>						
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	14	11	21	25	17	11
Copper	9.4	8.6	13	14	17	13
Lead	24	20	41	36	BDL	BDL
Zinc	44	45	64	64	44	43
<u>Arsenic (µg/g)</u>	BDL	BDL	5.9	6.2	BDL	BDL
<u>Mercury (µg/g)</u>	BDL	BDL	BDL	BDL	BDL	BDL

* As calibrated to an isobutylene standard.
 BKD No readings above ambient background.
 NA Not analyzed.
 BDL Below detection limit.

Source: ESE, 1987.

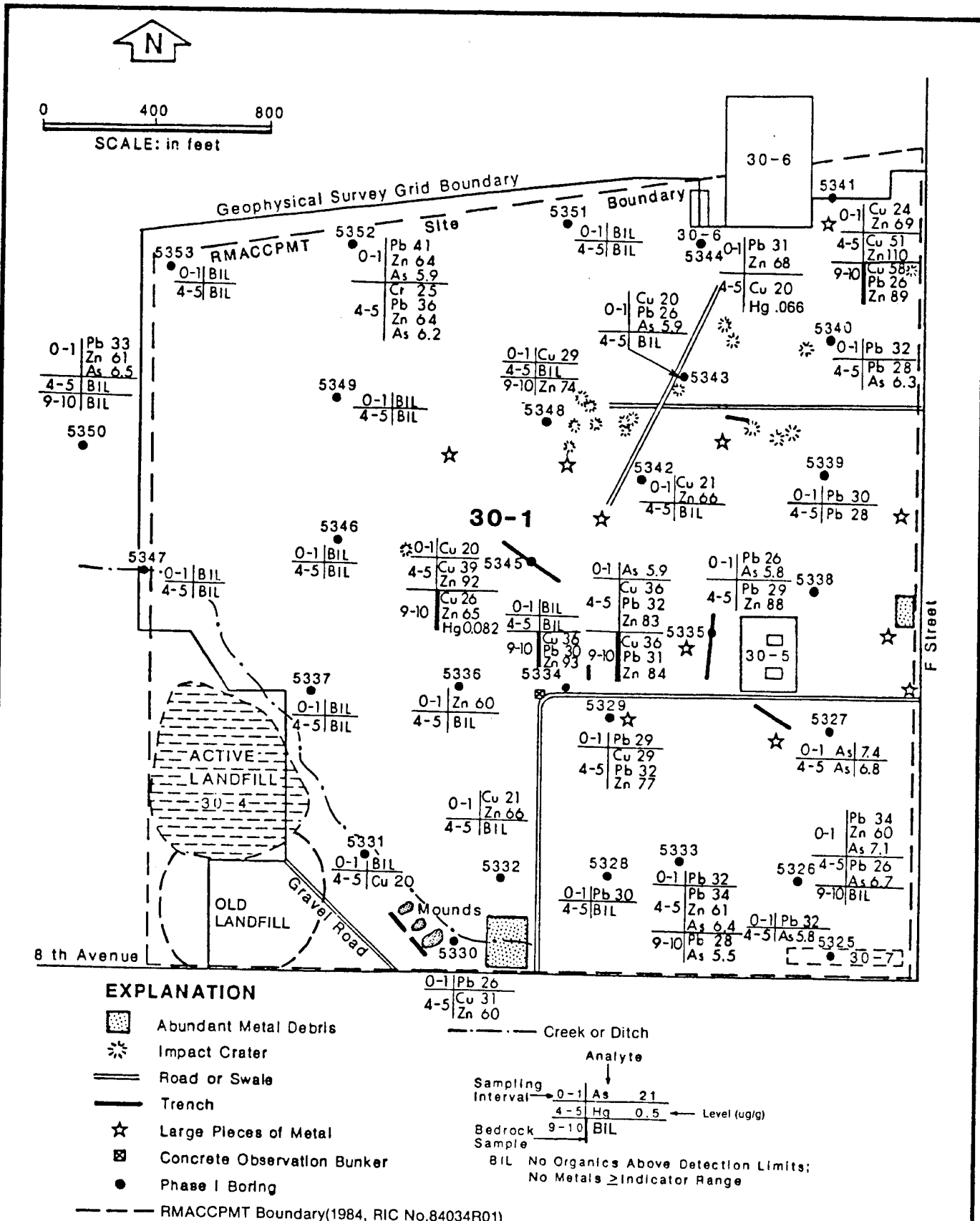


Figure 30-1-8
 PHASE I INVESTIGATION
 CHEMICAL ANALYSIS RESULTS
 SITE 30-1
 SOURCE: HLA 1987

Prepared for:
 U.S. Army Program Manager's Office
 For Rocky Mountain Arsenal
 Aberdeen Proving Ground, Maryland

01/18/88

Several compounds were detected by GC/MS that were not included in the target compound list and that were not conclusively identified. Table 30-1-3 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 30-1. It should be noted that an individual compound may have more than one relative retention time and also that a particular retention time may be assigned to more than one compound. Therefore, Table 30-1-3 provides only a general indication of additional compounds that may be present.

Ninety-seven nontarget identifications were recorded and 45 sample intervals were found to contain nontarget compounds at concentrations ranging from 0.3 to 7 ppm. Most of these compounds were tentatively identified as naturally-occurring semivolatile organic compounds. Phthalates were detected in three samples, and oxybis ethanol (diethylene glycol) was detected in three others. Thirty-five nontargets were detected at low levels and could not be identified.

The nontarget data were reviewed and assessed with respect to the site's historical use. The compounds identified are attributable to naturally-occurring degradation products. The 2,2-(1,2 ethane diyl-bis) oxybis ethanol was the only exception. Oxybis ethanol (diethylene glycol) is a common component in antifreeze. Although this compound only occurred in Lot BMS, no positive identification of oxybis ethanol could be made from the method blank nontarget analysis. It should be noted, however, that all Task 14 borings where oxybis ethanol was detected were drilled in the winter months. In the field, antifreeze is put in the steam cleaner overnight during winter months, and bled out of the lines before decontamination procedures. It is thought that incomplete bleeding of the line contaminated drilling equipment with antifreeze, and likewise, samples from these borings. The remaining unknown compounds all occurred at low concentrations and are probably related to the natural environment rather than chemical contamination.

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 1 of 5)

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration Above Background (ppm)*	Sample Number	Lot	Best Fit	Comments†
5325	0-1	625	0.8	30-1-1	BMT	Phthalate	a, c, g, h
		626	1	30-1-1	BMT	Phthalate	a, d, g, h
		628	0.6	30-1-1	BMT	Phthalate	a, c, g, h
		631	0.5	30-1-1	BMT	Octadecanol	d
		634	0.4	30-1-1	BMT	Unknown	a
		636	6	30-1-1	BMT	Bis (2-ethyl-hexyl) phthalate	c
5326	4-5	642	0.9	30-1-1	BMT	Unknown hydrocarbon	a, f, g, h
				30-1-2	BMU		j
				30-1-12	BMU		i
				30-1-13	BMU		i
5327	0-1	027	3	30-1-13	BMU		
		614	2	30-1-14	BMU	Dibutyl ester nonanedioic acid	d
		615	0.4	30-1-23	BMT	Unknown	a
		634	0.9	30-1-23	BMT	Unknown hydrocarbon	a, f, g
5328	4-5	642	0.6	30-1-23	BMT	Unknown	a
		642	0.4	30-1-24	BMT	Unknown	a
				30-1-34	BMU		i
5329	0-1	566	0.4	30-1-35	BMU	Unknown	a
		606	0.4	30-1-35	BMU	Methyl ester hexadecanoic acid	d, f
		633	0.6	30-1-36	BMU	Unknown	a
5330	0-1	609	0.5	30-1-56	MPH	Hexadecanoic acid	d
		611	0.5	30-1-56	MPH	Unknown hydrocarbon	a, d, f
		617	0.7	30-1-56	MPH	Unknown	a
		618	0.5	30-1-56	MPH	Unknown	a
		619	0.5	30-1-56	MPH	Unknown	a
				30-1-56	MPH	Unknown	a

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 7 of 5)

Borehole Number	Interval Depth (ft)	Concentration Above Background (ppm)*		Sample Number	Lot	Best Fit	Comments†
		Unknown Number					
5330	0-1	628	0.8	30-1-57	MPH	Unknown	a
		634	0.7	30-1-57	MPH	Unknown	a, f
		642	0.6	30-1-57	MPH	Unknown	a, f
		652	0.7	30-1-57	MPH	Unknown hydrocarbon	a, f
5330	4-5	634	1	30-1-57	MPH	Unknown hydrocarbon	a
		637	0.8	30-1-57	MPH	Bis (2-ethyl-hexyl) phthalate	c, f
5331	0-1	588	3	30-1-67	MPD	Diethyl phthalate	c
	4-5	634	0.5	30-1-68	MPD	Unknown hydrocarbon	a, f
5332	0-1	634	0.9	30-1-78	MPE	Unknown hydrocarbon	a, f
	4-5	634	0.7	30-1-79	MPE	Unknown hydrocarbon	a, f
5333	0-1	620	0.4	30-1-89	BMV	Unknown	a
		634	0.4	30-1-89	BMV	Unknown	a
	642	0.3	30-1-89	BMV	Unknown	a	
	4-5	614	2	30-1-90	BMV	Dibutyl ester nonanedioic acid	i
		614	2	30-1-91	BMV	Dibutyl ester nonanedioic acid	d
5334	0-1	634	0.4	30-1-100	BMT	Unknown hydrocarbon	a, f, g
		642	0.4	30-1-100	BMT	Unknown	a
				30-1-101	BMT		i
	9-10			30-1-102	BMT		i
5335	0-1	582	0.4	30-1-111	BMS	Unknown	a
		614	6	30-1-111	BMS	Octadecanol	d
		615	0.4	30-1-111	BMS	Unknown	a
		642	0.5	30-1-111	BMS	Unknown	a
		650	0.5	30-1-111	BMS	Unknown	a

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 3 of 5)

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration Above Background (ppm)*	Sample Number	Lot	Best Fit	Comments†
5335	4-5	582	0.5	30-1-112	BMS	2,2' (1,2 Ethane diyl-bis) oxybis ethanol	f
		614	7	30-1-112	BMS	Octadecanol	d
		623	0.5	30-1-112	BMS	Unknown	a
		550	0.5	30-1-113	BMS	Heptanoic acid	d
5336	0-1 4-5	614	2	30-1-113	BMS	Octadecanol	d
		634	0.3	30-1-122	MPE	Unknown hydrocarbon	a, f
		615	1	30-1-123	MPE	Dibutyl nonanedioate	d
		634	0.6	30-1-123	MPE	Unknown hydrocarbon	a, f
		634	1	30-1-133	MFG	Unknown hydrocarbon	a
				30-1-134	MFG		j
5338	0-1	562	0.4	30-1-144	BMS	Unknown	a
		582	0.8	30-1-144	BMS	2,2' (1,2 Ethane diyl-bis) oxybis ethanol	f
		614	4	30-1-144	BMS	Octadecanol	d
		615	0.6	30-1-144	BMS	Unknown	a
		634	0.5	30-1-144	BMS	Unknown	a
		642	0.6	30-1-144	BMS	Unknown	a
		614	2	30-1-145	BMS	Octadecanol	d
		559	0.4	30-1-155	BMS	Unknown	a
		562	0.6	30-1-155	BMS	Unknown	a
		566	0.7	30-1-155	BMS	Nonanoic acid	d
5339	0-1	582	0.9	30-1-155	BMS	2,2' (1,2 Ethane diyl bis) oxybis ethanol	f
		614	5	30-1-155	BMS	Octadecanol	d
		615	0.6	30-1-155	BMS	Octadecanol	d
		634	0.5	30-1-155	BMS	Unknown hydrocarbon	a, f
		642	0.6	30-1-155	BMS	Unknown	a
		614	4	30-1-156	BMS	Octadecanol	d
		642	0.4	30-1-156	BMS	Unknown	a
		614	2	30-1-166	BMS	Octadecanol	d
		634	0.5	30-1-166	BMS	Unknown hydrocarbon	a, f

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 4 of 5)

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration Above Background (ppm)*	Sample Number	Lot	Best Fit	Comments†
5340	4-5	614	2	30-1-167	BMS	Octadecanol	d
		642	0.6	30-1-167	BMS	Unknown hydrocarbon	a, f
5341	0-1	615	3	30-1-177	MPB	Dibutyl nonanedioate	j
	4-5			30-1-178	MPB		d
	9-10			30-1-179	MPB		a
5342	0-1	634	0.9	30-1-188	MFC	Unknown hydrocarbon	a, f
	4-5	634	0.9	30-1-189	MFC	Unknown hydrocarbon	a, f
5343	0-1	642	0.8	30-1-199	BMS	Unknown	a
		650	0.4	30-1-199	BMS	Unknown	a
	4-5	614	6	30-1-200	BMS	Octadecanol	d
		633	0.9	30-1-200	BMS	Unknown	a
		582	0.9	30-1-210	MPB	Unknown hydrocarbon	a, f
4-5			30-1-211	MPB		i	
5345	0-1	634	0.7	30-1-221	MPH	Unknown hydrocarbon	i
	4-5			30-1-222	MFC		a, f
	9-10			30-1-223	MFC		a
5346	0-1	615	0.4	30-1-232	MPH	Dibutyl nonanedioate	j
	4-5			30-1-233	MPH		d
5347	0-1	635	0.8	30-1-243	MPE	Unknown hydrocarbon	a, f
	4-5	634	0.7	30-1-244	MPE	Unknown hydrocarbon	a, f
5348	0-1			30-1-254	MPB		i
	4-5			30-1-255	MPB		i

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 5 of 5)

Borehole Number	Interval		Unknown Number	Concentration		Sample Number	Lot	Best Fit	Comments†
	Depth (ft)	Depth (ft)		Above Background (ppm)*	Above Background (ppm)*				
5348	9-10		094	0.2		30-1-256	MLS	Unknown hydrocarbon	a, f
			615	1		30-1-256	MLS	Dibutyl nonanedioate	d
5349	0-1		635	1		30-1-265	MPE	Unknown hydrocarbon	a
	4-5					30-1-266	MPE		i
5350	0-1					30-1-276	BMU		i
	4-5					30-1-277	BMU		i
	9-10		614	0.4		30-1-278	BMU	Unknown	a
5351	0-1					30-1-287	BMT		i
	4-5		633	0.4		30-1-288	BMT	Unknown	a
5352	0-1		642	0.4		30-1-298	BMV	Unknown	a
	4-5		648	0.4		30-1-299	BMV	Unknown	a
5353	0-1					30-1-309	MPH		i
	4-5		634	1		30-1-310	MPC	Unknown hydrocarbon	a

* Values reported are blank corrected.

- † a. No positive identification.
- b. Surfactant.
- c. Plasticizer (note: All phthalates and adipates will have this comment).
- d. Derived from natural products.
- e. Suspected laboratory contaminant.
- f. Low concentration.
- g. Low frequency of occurrence.
- h. Ubiquitous.
- i. Possible column bleed.
- j. None detected.

Source: ESE, 1987.

Although two of six borings (5335 and 5345) were in trenches suspected of containing contamination, only Sample 5345 (9- to 10-ft) was visibly stained with green specks and spots. Copper, zinc, and mercury were detected in this sample at concentrations within their respective indicator ranges. Many other samples with no visible discoloration contained similar metal values.

3.2.5 Phase I Contamination Assessment

A significant portion of Site 30-1 is underlain by relatively shallow (6- to 9-ft) bedrock which influenced metal concentration values in 4- to 5- and 9- to 10-ft sample intervals. Bedrock (Denver Formation) samples usually displayed copper, zinc, and other metals at concentrations within and above their indicator range depending on lithology. Consequently, metal values from deep samples must be evaluated with regard to lithologic variations. It should be noted that established indicator ranges are based on metal values for surficial alluvium (0- to 5-ft) and do not necessarily reflect geochemical variations between alluvial and bedrock environments. Except for an elevated lead value in the 0- to 1-ft interval of Borehole 5352, 4- to 5- and 9- to 10-ft are the only other intervals where metal values were detected above the indicator ranges.

Copper, lead, and zinc were detected at levels above their indicator ranges in 13 samples (6 boreholes) collected within or slightly above the weathered or slightly reworked bedrock zone or within a brown silty-clay horizon. These six borings are located within the broad curving band of out-of-phase EM anomalies. This conductivity band is represented by shallow (<10 ft) volcanoclastic bedrock, as evidenced by seven borings logged for geologic horizons. The presence of shallow bedrock is further indicated by several Site 30-5 Phase I borings that encountered bedrock at 3- to 4-ft (Figure 30-1-6), and borings from Site 30-6 which displayed similar geochemical patterns.

Boring 5345 was noted to contain green specks in the 9- to 10-ft sample. The cause of this green coloration was not determined; however, metal concentrations were within or below indicator level for this bedrock sample. No volatile or semivolatile compounds were detected in this sample.

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The north-south oriented trench containing Boring 5335 is within a widespread magnetic and electromagnetic anomaly. No geophysical response was directly related to the trench, and Boring 5335 contained metal concentrations indicative of shallow bedrock rather than trench disposal.

A possible burn area was noted by Stout et al. (1982, RIC#83368R01) in their aerial photograph interpretation of the eastern site boundary. This area corresponds to an area of scattered metal debris, scattered clay building tiles, and bricks. Historical information indicates an agricultural use silo once stood at this location, and the debris is thought to be the result of its demolition. A Phase II boring is suggested to provide more information on activity at this location.

A pit was excavated at geophysical Anomaly C to explain the intense magnetic and electro-magnetic response. Geologists logging the pit identified bedrock at 8 ft, and no evidence of disposal activity was observed. A trench cut across a similar anomaly in Site 30-6 also identified shallow bedrock as cause for the geophysical responses. No further investigation is required in this area.

Geophysical results for the trenches just west of Boring 5330 (Anomaly D, Figure 30-1-7) strongly suggest the presence of buried metal debris. Some of the highest in-phase and out-of-phase EM values in Site 30-1 were found in this area. The mounds associated with these trenches are outside the area of high magnetic and in-phase intensities, and no visible evidence of debris is present. Bedrock influences for Anomaly D are probably insignificant relative to Anomalies B and C. Additional borings in these trenches are suggested on the basis of the geophysical response and observed debris in and around Anomaly D. The mounds east of the trenches display no discrete geophysical response and contain no visible debris or indication of contamination. The mounds are most likely the original excavation material and do not warrant further investigation.

A large area underlain by volcanoclastic material in the bedrock was delineated by the magnetic technique and, to a lesser degree, by in-phase EM. This area (Anomaly B) extends east of the site boundary into the

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southwestern portion of Site 29-4. The elevated copper, lead, and zinc values found in samples from this anomaly are related to the erratic deposition of metals caused by the weathering and reworking of the Denver Formation.

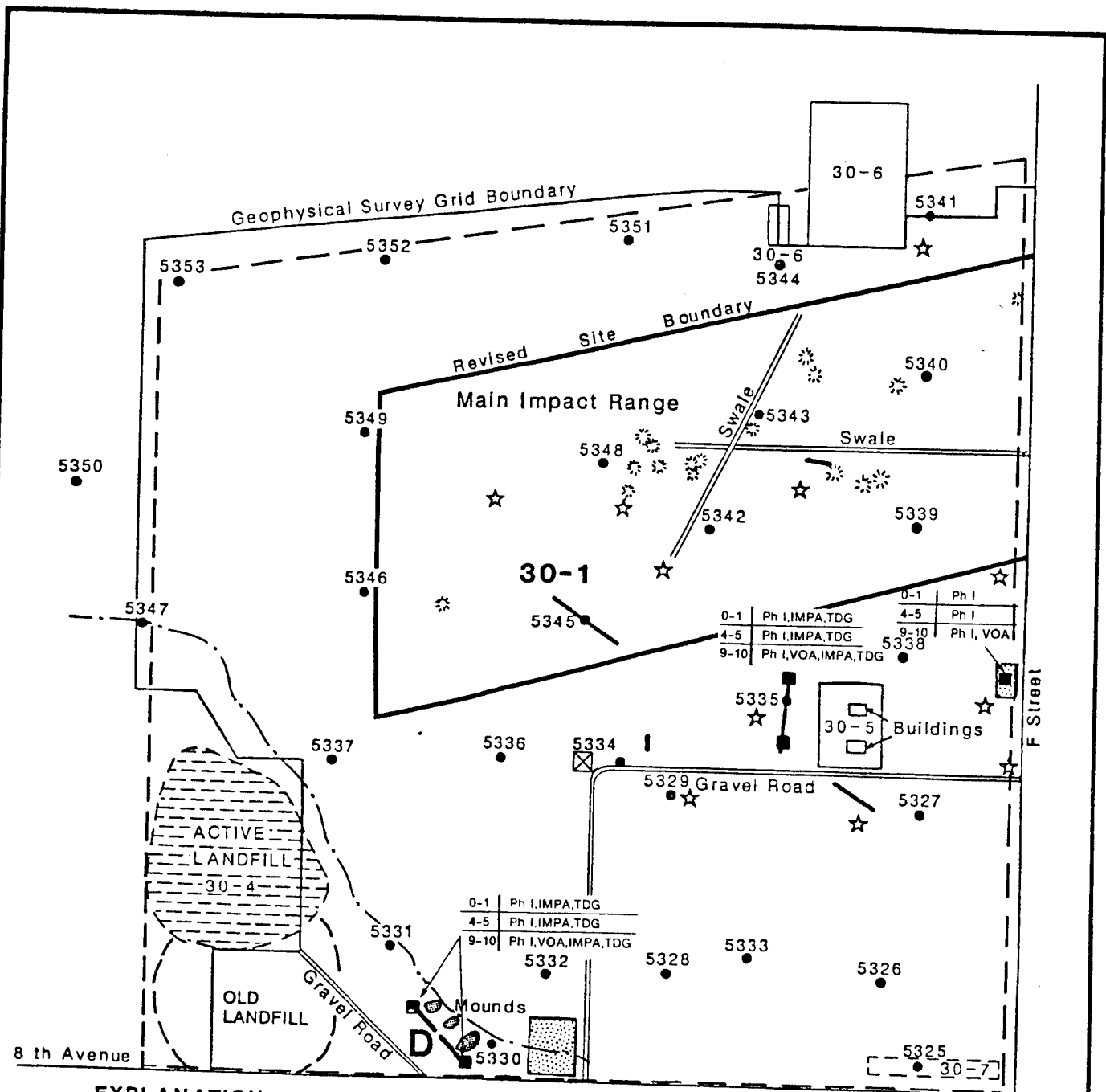
The following three areas at Site 30-1 have not been fully explored or defined by the Phase I investigation. A Phase II investigation is warranted for these areas:

- o Geophysical Anomaly D, which is centered on the trenches in the south - central portion of the site;
- o The trench investigated by Boring 5335; and
- o The small area of demolition and metal debris identified as a burn scar along the eastern site boundary.

3.3 PHASE II SURVEY

A Phase II program will be conducted at this site to examine the following three areas:

- o Two 10 ft borings will investigate geophysical Anomaly D for any chemical compounds related to the strong geophysical anomalies in the two trenches. Samples will be taken from the intervals of 0 to 1, 4 to 5, and 9 to 10 ft and analyzed for the Phase I suite of analytes. An isopropylmethyl phosphonate (IMPA) and thiodiglycol (TDG) analysis will be conducted on all samples to test for Army agent degradation products. The deepest interval will also be analyzed for volatile organic compounds, or in other intervals as necessitated by field conditions;
- o The trench investigated by Boring 5335 will be investigated by two additional borings: one placed to the north and one placed south of Boring 5335 (Figure 30-1-9). These 10 ft borings will be sampled at the intervals of 0 to 1, 4 to 5, and 9 to 10 ft and analyzed for the Phase I suite. An IMPA and TDG analysis will also be conducted on all samples to test for Army agent degradation products. Volatile organic compounds will be analyzed on the deepest interval in each boring and in samples as necessitated by field conditions; and

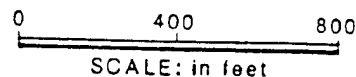


EXPLANATION

- Abundant Metal Debris
- Impact Crater
- Road or Swale
- Trench
- Large Pieces of Metal
- Concrete Observation Bunker
- Phase I Boring
- Phase II Boring

ABBREVIATION KEY

- Ph I Phase I Analysis
- VOA Volatile Organic Analysis
- IMPA Isopropylmethylphosphonate Analysis
- TDG Thiodiglycol Analysis



--- Creek or Ditch

--- RMACCPMT Boundary
(1984, RIC No.84034R01)

Figure 30-1-9
**PROPOSED PHASE II INVESTIGATION
 BORING LOCATION MAP, SITE 30-1**
 SOURCE: HARDING LAWSON ASSOCIATES

Prepared for:
**U.S. Army Program Manager's Office
 For Rocky Mountain Arsenal**
 Aberdeen Proving Ground, Maryland

- o A possible burn area noted by Stout et al. (1982, RIC#83368R01) and mapped by geophysicists as an area of abundant surface metal (Figure 30-1-7) will be investigated by a single 10-ft boring with the intervals of 0 to 1, 4 to 5, and 9 to 10 ft analyzed for Phase I analytes. This area is thought to be the demolition remains of a farming silo based on historical information and visual inspection. The deepest sample interval from this boring will also be analyzed for volatile organic compounds.

In summary, 5 borings (20 samples) are recommended for the Phase II program. Following this program, site boundaries will be further modified and new volume/area estimates will be calculated.

Comments on the draft final version of this report were received from Shell Chemical Company on July 1, 1987 and from Colorado Department of Health on October 27, 1987. Additional comments were received from the U.S. Environmental Protection Agency on October 29, 1987. These comments were considered in the preparation of this final report and are presented with responses in Appendix 30-1-C.

3.4 QUANTITY OF POTENTIALLY CONTAMINATED SOIL

The Decontamination Assessment Report (RMACCPMT, 1984, RIC#84034R01) outlined a hypothetical cleanup strategy for Site 30-1. The plan called for the excavation and removal of 241,000 bank cubic yards (bcy) of material. The estimated depth of excavation was 6 ft. UXO and contaminated soil were assumed to account for 0.1 and 15 percent of the total volume, respectively (RMACCPMT, 1984, RIC#84034R01).

Phase I field observations suggest that a large part of Site 30-1 is affected by metal associated with mortar impacts. Metal debris is thought to be less abundant outside the primary impact area. The main impact range should include a relatively small amount of potentially contaminated soil

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relative to its overall size; nevertheless, excavation will be necessary to remove buried mortar fragments and/or UXO. Although the volume of fragments and UXO is probably small (i.e.; a few cubic yards), a significant amount of soil would have to be screened to find it.

The areal extent of the geophysical anomaly, trench, and burn scar have been estimated as 10,500, 7,000, and 20,000 ft², respectively. Assuming a 6-ft depth, the volume of potentially contaminated soils for these areas is 8,400 bcy.

The revised site boundary for the main impact range is shown in Figure 30-1-9. This area occupies 2,100,000 ft² and is estimated to contain 70,000 bcy of hazardous waste and 470 bcy of UXO, on the basis of a 6-ft excavation depth and criteria in the Decontamination Assessment Report (RMACCPMT, 1984, RIC#84034R01). These estimates are speculative and will remain so until further information is available on the type, quantity, and depth of potentially contaminated debris.

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APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

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APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

PHASE I ANALYTES AND CERTIFIED METHODS

Analytes/Methods	Synonymous Names and Abbreviations	Standard Abbreviations
VOLATILE ORGANIC COMPOUNDS/GCMS		
	VOL	VO
1,1-Dichloroethane	1,1-Dichloroethane	11DCLE
1,2-Dichloroethane	1,2-Dichloroethane	12DCLE
1,1,1-Trichloroethane (TCA)	1,1,1-Trichloroethane	111TCE
1,1,2-Trichloroethane	1,1,2-Trichloroethane	112TCE
Benzene	Benzene	C ₆ H ₆
Bicycloheptadiene	Bicycloheptadiene (BCHD)	BCHPD
Carbon tetrachloride	Carbon tetrachloride	CCL ₄
Chlorobenzene	Chlorobenzene	CLC ₆ H ₅
Chloroform	Chloroform	CHCl ₃
Dibromochloropropane	Dibromochloropropane	DBCP
Dicyclopentadiene	Dicyclopentadiene	DCPD
Dimethyldisulfide	Dimethyldisulfide	DMDS
Ethylbenzene	Ethylbenzene	ETC ₆ H ₅
m-Xylene	meta-Xylene	13DMB
Methylene chloride	Methylene chloride	CH ₂ Cl ₂
Methylisobutyl ketone	Methylisobutyl ketone	MIBK
o,p-Xylene	ortho- and/or para-Xylene	XYLEN
Tetrachloroethene (PCE)	Tetrachloroethylene	TCLEE
Toluene	Toluene	MEC ₆ H ₅
Trans 1,2-dichloroethene	Trans 1,2-dichloroethylene	12DCE
Trichloroethene (TCE)	Trichloroethylene	TRCLE
SEMIVOLATILE ORGANIC COMPOUNDS/GCMS		
	EXTRACTABLE ORGANIC COMPOUNDS (EX)	SVO
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	Dichlorodiphenyltrichloroethane	PPDDT
Aldrin	Aldrin	ALDRN
Atrazine	Atrazine	ATZ
Chlordane	Chlordane	CLDAN
Chlorophenylmethyl sulfide	p-Chlorophenylmethyl sulfide	CPMS
Chlorophenylmethyl sulfoxide	p-Chlorophenylmethyl sulfoxide	CPMSO
Chlorophenylmethyl sulfone	p-Chlorophenylmethyl sulfone	CPMSO ₂
Dibromochloropropane	Dibromochloropropane	DBCP
Dicyclopentadiene	Dicyclopentadiene	DCPD
Dieldrin	Dieldrin	DLDRN
Diisopropylmethyl phosphonate	Diisopropylmethyl phosphonate	DIMP

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APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

Analytes/Methods	Synonymous Names and Abbreviations	Standard Abbreviations
SEMIVOLATILE ORGANIC COMPOUNDS (CONT)		
Dimethylmethyl phosphonate	Dimethylmethyl phosphonate	DMMP
Dithiane	Dithiane	DITH
Endrin	Endrin	ENDRN
Hexachlorocyclopentadiene	Hexachlorocyclopentadiene (HCPD)	CL ₆ CP
Isodrin	Isodrin	ISODR
Malathion	Malathion	MLTHN
Parathion	Parathion	PRTHN
Supona	2-Chloro-1(2,4-dichlorophenyl) vinyl diethyl phosphate	SUPONA
Vapona	Vapona	DDVP
METALS/ICP		
Cadmium	ICAP	ICP
Chromium	Cadmium	CD
Copper	Chromium	CR
Lead	Copper	CU
Zinc	Lead	PB
	Zinc	ZN
SEPARATE ANALYSES		
Arsenic/AA	Arsenic	AS
Mercury/AA	Mercury	HG

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APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

PHASE II ANALYTES AND CERTIFIED METHODS

Analytes/Methods	Synonymous Names and Abbreviations	Standard Abbreviations
VOLATILE ORGANIC COMPOUNDS/GCMS (Same as Phase I)	VOL	VO
SEMIVOLATILE ORGANIC COMPOUNDS/GCMS (Same as Phase I)	EXTRACTABLE ORGANIC COMPOUNDS (EX)	SVO
VOLATILE HALOCARBON COMPOUNDS/GCCON	PURGEABLE HALOCARBONS (PHC)	VHO
1,1-Dichloroethane	1,1-Dichloroethane	11DCLE
1,2-Dichloroethane	1,2-Dichloroethane	12DCLE
1,1-Dichloroethene	1,1-Dichloroethene	11DCE
1,1,1-Trichloroethane (TCA)	1,1,1-Trichloroethane	111TCE
1,1,2-Trichloroethane	1,1,2-Trichloroethane	112TCE
Carbon tetrachloride	Carbon tetrachloride	CCL ₄
Chlorobenzene	Chlorobenzene	CLC ₆ H ₅
Chloroform	Chloroform	CHCL ₃
Methylene chloride	Methylene chloride	CH ₂ CL ₂
Trans 1,2-dichloroethylene	Trans 1,2-dichloroethene	12DCE
Tetrachloroethene (PCE)	Tetrachloroethylene	TCLEE
Trichloroethene (TCE)	Trichloroethylene	TRCLE
VOLATILE HYDROCARBON COMPOUNDS/GCFID	DCPD	HYDCBN
Bicycloheptadiene	Bicycloheptadiene (BCHD)	BCHPD
Dicyclopentadiene	Dicyclopentadiene	DCPD
Methylisobutyl ketone	Methylisobutyl ketone	MIBK
VOLATILE AROMATIC COMPOUNDS/GCPID	PURGEABLE AROMATICS (PAM)	VAO
Benzene	Benzene	C ₆ H ₆
Ethylbenzene	Ethylbenzene	ETC ₆ H ₅
m-Xylene	meta-Xylene	13DMB
o,p-Xylene	ortho- and/or para-Xylene	XYLEN
Toluene	Toluene	MEC ₆ H ₅
ORGANOCHLORINE PESTICIDES/GCEC		OCF
2,2-Bis (para-chlorophenyl)- 1,1-dichloroethane	Dichlorodiphenylethane	PPDDE
2,2-Bis (para-chlorophenyl)- 1,1,1-trichloroethane	Dichlorodiphenyltrichloroethane	PPDDT
Aldrin	Aldrin	ALDRN
Chlordane	Chlordane	CLDAN
Dieldrin	Dieldrin	DLDRN
Endrin	Endrin	ENDRN
Hexachlorocyclopentadiene	Hexachlorocyclopentadiene	CL ₆ CP
Isodrin	Isodrin	ISODR

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APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

Analytes/Methods	Synonymous Names ---and Abbreviations---	Standard Abbreviations
ORGANOPHOSPHOROUS PESTICIDES/GCNPD	ORGANOPHOSPHOROUS COMPOUNDS (OPC)	OPP
Atrazine	Atrazine	ATZ
Malathion	Malathion	MLTHN
Parathion	Parathion	PRTHN
Supona	2-Chloro-1(2,4-dichlorophenyl) vinyl diethyl phosphate	SUPONA
Vapona	Vapona	DDVP
ORGANOPHOSPHOROUS COMPOUNDS/GCFPD	DIMP	OPC
Diisopropylmethyl phosphonate	Diisopropylmethyl phosphonate	DIMP
Dimethylmethyl phosphonate	Dimethylmethyl phosphonate	DMMP
ORGANOSULPHUR COMPOUNDS/GCFPD		OSC
1,4-Oxathiane	1,4-Oxathiane	OXAT
Benzothiazole	Benzothiazole	BTZ
Chlorophenylmethyl sulfide	p-Chlorophenylmethyl sulfide	CPMS
Chlorophenylmethyl sulfone	p-Chlorophenylmethyl sulfone	CPMSO ₂
Chlorophenylmethyl sulfoxide	p-Chlorophenylmethyl sulfoxide	CPMSO
Dimethyldisulfide	Dimethyldisulfide	DMDS
Dithiane	Dithiane	DITH
METALS/ICP	ICAP	ICP
Cadmium	Cadmium	CD
Chromium	Chromium	CR
Copper	Copper	CU
Lead	Lead	PB
Zinc	Zinc	ZN
SEPARATE ANALYSES		
Arsenic/AA	Arsenic	AS
Mercury/AA	Mercury	HG

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APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

Analytes/Methods	Synonymous Names and Abbreviations	Standard Abbreviations
ARMY AGENT DEGRADATION PRODUCTS:		ADP
AGENT PRODUCTS/HPLC	TDGCL	
Chloroacetic Acid	Chloroacetic acid	CLC2A
Thiodiglycol	Thiodiglycol (TDG)	TDGCL
AGENT PRODUCTS/IONCHROM	IMPA	GBDP
Fluoroacetic acid	Fluoroacetic acid	FC2A
Isopropylmethylphosphonic acid	Isopropylmethylphosphonate	IMPA
Methylphosphonic acid	Methylphosphonate	MPA

Methods	Abbreviations
Atomic Absorption Spectroscopy	AA
Gas Chromatography/Conductivity Detector	GCCON
Gas Chromatography/Electron Capture	GCEC
Gas Chromatography/Flame Ionization Detector	GCFID
Gas Chromatography/Flame Photometric	GCFPD
Gas Chromatography/Mass Spectrometry	GCMS
Gas Chromatography/Nitrogen Phosphorous Detector	GCNPD
Gas Chromatography/Photoionization Detector	GCPID
High Performance Liquid Chromatography	HPLC
Inductively Coupled Argon Plasma	ICP, ICAP
Ion Chromatography	IONCHROM

APPENDIX 30-1-B
PHASE I CHEMICAL DATA

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	DATE	TIME	5325A	5325B	5326A	5326B	5326C	5327A	5327B	5328A	5328B	5329A	5329B	5330A	5330B	5331A		
DATE			03/27/86	08:21	03/27/86	03/27/86	03/27/86	03/27/86	03/27/86	03/27/86	00:00	00:00	03/28/86	10:40	03/28/86	10:14	04/11/86	14:10	04/02/86	10:37
TIME			08:21	08:21	08:21	08:21	09:40	09:40	09:40	00:00	00:00	10:40	10:40	10:14	10:14	14:10	14:10	14:10	10:37	10:37
SAMPLE TYPE		71999	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH		0	0.0	0.0	0.0	4.00	4.00	9.00	9.00	0.0	4.00	0.0	4.00	0.0	4.00	0.0	4.00	0.0	4.00	0.0
FT		0	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
SITE TYPE I		0	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
INSTALLATION CODE		99720	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
SAMPLE		0	186050	186302	186302	186302	186302	186302	186302	186302	186309	186309	186309	186309	186309	186309	186309	186309	186309	186309
TECHNIQUE		0	2193659	2193538	2193538	2193538	2193538	2193538	2193538	2193638	2192886	2192886	2192886	2192886	2192886	2192886	2192886	2192886	2192886	2192886
COORDINATE N/S		0	11.1	10.7	13.6	11.5	19.5	47.2	5.78	10.7	12.8	7.4	8.9	7.0	10.0	13.1	16.5	10.7	8.0	8.0
STP		0	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900
MOISTURE		0	20.5	13.6	11.5	19.5	47.2	5.78	10.7	12.8	7.4	8.9	7.0	10.0	13.1	16.5	10.7	8.0	8.0	8.0
WNET WT		0	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900
CADMIUM		0	1028	1043	1052	1093	1003	71921	98356	98365	98364	98369	98361	0	0	0	0	0	0	0
UG/G-DRY		0	20.5	13.6	11.5	19.5	47.2	5.78	10.7	12.8	7.4	8.9	7.0	10.0	13.1	16.5	10.7	8.0	8.0	8.0
CHROMIUM		0	14.3	31.9	59.3	44.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70
UG/G-DRY		0	14.3	31.9	59.3	44.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70
COPPER		0	12.8	15.6	23.6	30.5	34.1	54.4	76.7	9.09	14.0	18.3	26.3	31.5	31.5	31.5	31.5	31.5	31.5	31.5
UG/G-DRY		0	12.8	15.6	23.6	30.5	34.1	54.4	76.7	9.09	14.0	18.3	26.3	31.5	31.5	31.5	31.5	31.5	31.5	31.5
LEAD		0	12.8	15.6	23.6	30.5	34.1	54.4	76.7	9.09	14.0	18.3	26.3	31.5	31.5	31.5	31.5	31.5	31.5	31.5
UG/G-DRY		0	12.8	15.6	23.6	30.5	34.1	54.4	76.7	9.09	14.0	18.3	26.3	31.5	31.5	31.5	31.5	31.5	31.5	31.5
ZINC		0	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7
UG/G-DRY		0	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7	53.2	46.7
ARSENIC		0	7.39	6.75	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70
UG/G-DRY		0	7.39	6.75	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70
MERCURY		0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
UG/G-DRY		0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ALDRIN		0	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900
UG/G-DRY		0	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900
DIELDRIN		0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
UG/G-DRY		0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
DDT, PP'		0	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400
UG/G-DRY		0	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400
ENDRIN		0	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700
UG/G-DRY		0	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700
CHLORDANE		0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
UG/G-DRY		0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SC LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORER #	DATE	5325A	5325B	5326A	5326B	5326C	5327A	5327B	5328A	5328B	5329A	5329B	5330A	5330B	5331A
		METHOD	TIME	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
				1	2	12	13	14	23	24	34	35	45	46	56	57	67
DDE, PP'	UG/G-DRY	98363	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500
1,4 OXATHIANE	UG/G-DRY	98644	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500
DIMP	UG/G-DRY	98645	03/27/86	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.00	<3.00	<3.00
VAPONA	UG/G-DRY	98646	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
HEXACHLOROCYCLOPENTADIENE	UG/G-DRY	98647	03/27/86	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MALATHION	UG/G-DRY	98648	03/27/86	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.00	<2.00	<2.00
ISODRIN	UG/G-DRY	98649	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600
1,4 DITHIANE	UG/G-DRY	98650	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.00	<2.00	<2.00
DICYCLOPENTADIENE	UG/G-DRY	98651	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00	<6.00
DBCP (NEMAGON)	UG/G-DRY	98652	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600
P-CLPHENYLMETHYL-SULFIDE	UG/G-DRY	98653	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
P-CLPHENYLMETHYL-SULFOXIDE	UG/G-DRY	98654	03/27/86	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.00	<1.00	<1.00
ATRAZINE	UG/G-DRY	98655	03/27/86	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500	<0.500
SUPONA	UG/G-DRY	98656	03/27/86	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900	<0.900
DMPP	UG/G-DRY	98657	03/27/86	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<3.00	<3.00
PARATHION	UG/G-DRY	98658	03/27/86	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.00	<2.00	<2.00
P-CLPHENYLMETHYL-SULFONE	UG/G-DRY	98703	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400
TRANS-1,2-DICHLOROETHENE	UG/G-DRY	98687	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400
ETHYLBENZENE	UG/G-DRY	98688	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400
METHYLENE CHLORIDE	UG/G-DRY	98689	03/27/86	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400

PROJECT NUMBER 85937 0420 RMA TASK14
 PROJECT MANAGER H. WITT
 LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	DATE	TIME	5325A	5325B	5326A	5326B	5326C	5327A	5327B	5328A	5328B	5329A	5329B	5330A	5330B	5331A
TETRACHLOROETHENE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98690			1	2	12	13	14	23	24	34	35	45	46	56	57	67
TOLUENE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98691			1	2	12	13	14	23	24	34	35	45	46	56	57	67
1,1,1-TRICHLOROETHANE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98692			1	2	12	13	14	23	24	34	35	45	46	56	57	67
1,1,2-TRICHLOROETHANE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98693			1	2	12	13	14	23	24	34	35	45	46	56	57	67
TRICHLOROETHENE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98694			1	2	12	13	14	23	24	34	35	45	46	56	57	67
M-XYLENE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98695			1	2	12	13	14	23	24	34	35	45	46	56	57	67
MIBK	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98696			1	2	12	13	14	23	24	34	35	45	46	56	57	67
DMS	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98697			1	2	12	13	14	23	24	34	35	45	46	56	57	67
BENZENE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98699			1	2	12	13	14	23	24	34	35	45	46	56	57	67
O-AND/OR P-XYLENE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98700			1	2	12	13	14	23	24	34	35	45	46	56	57	67
CARBON TETRACHLORIDE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98680			1	2	12	13	14	23	24	34	35	45	46	56	57	67
CHLOROBENZENE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98681			1	2	12	13	14	23	24	34	35	45	46	56	57	67
CHLOROFORM	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98682			1	2	12	13	14	23	24	34	35	45	46	56	57	67
1,1-DICHLOROETHANE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98683			1	2	12	13	14	23	24	34	35	45	46	56	57	67
1,2-DICHLOROETHANE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98684			1	2	12	13	14	23	24	34	35	45	46	56	57	67
BICYCLOHEPTADIENE	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98686			1	2	12	13	14	23	24	34	35	45	46	56	57	67
DBCP (NEHAGON)	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98652			1	2	12	13	14	23	24	34	35	45	46	56	57	67
DBCP	UG/G-DRY	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		98652			1	2	12	13	14	23	24	34	35	45	46	56	57	67
UNK588	UG/G	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		90049			1	2	12	13	14	23	24	34	35	45	46	56	57	67
UNK615	UG/G	0	03/27/86	08:21	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		90071			1	2	12	13	14	23	24	34	35	45	46	56	57	67

0.455

3.26

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SC LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	METHOD	DATE TIME	5325A	5325B	5326A	5326B	5326C	SAMPLE ID/#	5327A	5327B	5328A	5328B	5329A	5329B	5330A	5330B	5331A
		30-1	1	03/27/86	08:21	03/28/86	03/28/86	03/28/86	03/28/86	03/27/86	00:00	00:00	03/28/86	03/28/86	03/28/86	03/28/86	04/11/86	04/11/86	04/02/86
		30-1	2	08:21	09:40	09:40	09:40	09:40	09:40	00:00	00:00	00:00	10:40	10:40	10:14	10:14	14:10	14:10	10:37
UNK625	UG/G	90078	36	0.813															
UNK626	UG/G	90079	36	1.06															
UNK628	UG/G	90081	36	0.569												0.838			
UNK631	UG/G	90083	36	0.487															
UNK633	UG/G	90085	36																
UNK634	UG/G	90086	36	0.377						0.878							0.719	1.12	
UNK636	UG/G	90088	36	5.67															
UNK642	UG/G	90108	36	0.859						0.641	0.417						0.599		
UNK027	UG/G	90182	36					3.02											
UNK566	UG/G	90200	36												0.392				
UNK537	UG/G	90022	36																
UNK606	UG/G	90063	36																
UNK614	UG/G	90070	36					2.33											
UNK609	UG/G	90066	50																
UNK611	UG/G	90067	50																
UNK652	UG/G	90111	50																
UNK617	UG/G	90072	50																
UNK618	UG/G	90073	50																
UNK619	UG/G	90105	50																
UNK637	UG/G	90089	50																0.784

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	METHOD	5325A	5325B	5326A	5326B	5326C	5327A	5327B	5327C	5328A	5328B	5329A	5329B	5330A	5330B	5331A
UNK620	UG/G	90074		30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
UNK648	UG/G	90648		1	2	12	13	14	23	24	24	34	35	45	46	56	57	67
UNK550	UG/G	90550																
UNK559	UG/G	90099																
UNK562	UG/G	90033																
UNK582	UG/G	90045																
UNK599	UG/G	90127																
UNK623	UG/G	90077																
UNK650	UG/G	90134																
UNK535	UG/G	90087																
UNK094	UG/G	90007																
DATE				03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/28/86	03/28/86	04/11/86	04/11/86	04/02/86
TIME				08:21	08:21	09:40	09:40	09:40	00:00	00:00	10:40	10:40	10:40	10:14	10:14	14:10	14:10	10:37

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	METHOD	5331B	5332A	5332B	5333A	5333B	5333C	5334A	5334B	5334C	5335A	5335B	5335C	5336A	5336B
DATE				04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	03/27/86	03/27/86	03/27/86	03/26/86	03/26/86	03/26/86	04/02/86	04/02/86
TIME				10:37	10:16	10:16	10:37	10:37	10:37	09:01	09:01	09:01	14:39	14:39	14:39	13:04	13:04
SAMPLE TYPE		71999		SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH	FT	0		4.00	4.00	4.00	4.00	4.00	4.00	0.0	4.00	9.00	0.0	4.00	9.00	0.0	4.00
SITE TYPE 1		0		BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
INSTALLATION CODE		0		RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLE		0		S	S	S	S	S	S	S	S	S	S	S	S	S	S
SAMPLING TECHNIQUE		72005		0	0	0	0	0	0	0	0	0	0	0	0	0	0
COORDINATE, N/S		98392		186362	186301	186372	186372	186372	186372	186969	186969	186969	187192	187192	187192	186975	186975
STP		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
COORDINATE, E/W		98393		2192020	2192528	2193127	2193127	2193127	2193127	2192646	2192646	2192646	2193225	2193225	2193225	2192342	2192342
STP		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOISTURE	%WET WT	70320		7.4	14.7	9.1	8.5	9.5	10.6	12.0	5.2	19.3	11.5	21.0	20.3	10.8	6.3
		0		<0.510	<0.510	<0.510	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.510	<0.510
CADMIUM	UG/G- DRY	1028		17.2	19.4	15.7	18.1	20.8	17.5	11.9	<7.20	<7.20	15.4	<7.20	<7.20	16.3	9.92
		0		<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0
CHROMIUM	UG/G- DRY	99584		19.5	21.3	18.6	11.6	13.9	11.4	10.7	5.77	35.6	13.1	36.1	36.4	18.0	13.3
		0		55.4	66.4	49.9	49.7	60.9	46.8	40.4	25.6	92.6	49.8	82.8	84.4	59.6	36.9
COPPER	UG/G- DRY	1043		<5.20	<5.20	<5.20	<4.70	6.35	5.53	<4.70	<4.70	<4.70	5.90	<4.70	<4.70	<5.20	<5.20
		0		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
LEAD	UG/G- DRY	1052		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
		0		<0.500	<0.500	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500
ZINC	UG/G- DRY	1093		<0.600	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
		0		<2.00	<2.00	<2.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00
ARSENIC	UG/G- DRY	1003		<4.00	<4.00	<4.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00
		0		<6.00	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
MERCURY	UG/G- DRY	71921		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
		0		<0.500	<0.500	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500
ALDRIN	UG/G- DRY	98356		<0.600	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
		0		<2.00	<2.00	<2.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00
DIELDRIN	UG/G- DRY	98365		<4.00	<4.00	<4.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00
		0		<6.00	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
DDT, PP'	UG/G- DRY	98364		<6.00	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
		0		<6.00	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
ENDRIN	UG/G- DRY	98369		<6.00	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
		0		<6.00	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
CHLORDANE	UG/G- DRY	98361		<6.00	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
		0		<6.00	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	DATE	TIME	5332A	5332B	5333A	5333B	5333C	5334A	5334B	5334C	5335A	5335B	5335C	5336A	5336B	
5331B	30-1	68	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	13:04	04/02/86	13:04
					78	79	89	90	91	100	101	102	111	112	113	122	123	
DDE, PP'	UG/G-DRY	0	<0.500	<0.500	<0.500	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500
1,4 OXATHIANE	UG/G-DRY	0	<0.500	<0.500	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500
DIMP	UG/G-DRY	0	<3.00	<3.00	<3.00	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.00	<3.00	<3.00
VAPONA	UG/G-DRY	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
HEXACHLOROCYCLOPENTADIENE	UG/G-DRY	0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MALATHION	UG/G-DRY	0	<2.00	<2.00	<2.00	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.00	<2.00	<2.00
ISODRIN	UG/G-DRY	0	<0.600	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600
1,4 DITHIANE	UG/G-DRY	0	<2.00	<2.00	<2.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.00	<2.00	<2.00
DICYCLOPENTADIENE	UG/G-DRY	0	<6.00	<6.00	<6.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00	<6.00
DBCP(HEMAGON)	UG/G-DRY	0	<0.600	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600
P-CLPHENYLMETHYL-SULFIDE	UG/G-DRY	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
P-CLPHENYLMETHYL-SULFOXIDE	UG/G-DRY	0	<1.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.00	<1.00	<1.00
ATRAZINE	UG/G-DRY	0	<0.500	<0.500	<0.500	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500	<0.500
SUPONA	UG/G-DRY	0	<0.900	<0.900	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900	<0.900
DMP	UG/G-DRY	0	<3.00	<3.00	<3.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<3.00	<3.00
PARATHION	UG/G-DRY	0	<2.00	<2.00	<2.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.00	<2.00	<2.00
P-CLPHENYLMETHYL-SULFONE	UG/G-DRY	0	<0.400	<0.400	<0.400	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400
TRANS-1,2-DICHLOROETHENE	UG/G-DRY	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
ETHYLBENZENE	UG/G-DRY	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
METHYLENE CHLORIDE	UG/G-DRY	0	<0.400	<0.400	<0.400	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400

PROJECT NUMBER 85937 0420 RMA TASK 14
 PROJECT MANAGER H. WITT
 LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORER #	DATE	TIME	5332A	5332B	5333A	5333B	5334A	5334C	5335A	5335B	5335C	5336A	5336B
TETRACHLOROETHENE	UG/G-DRY	98690	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
TOLUENE	UG/G-DRY	98691	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
1,1,1-TRICHLOROETHANE	UG/G-DRY	98692	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
1,1,2-TRICHLOROETHANE	UG/G-DRY	98693	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
TRICHLOROETHENE	UG/G-DRY	98694	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
M-XYLENE	UG/G-DRY	98695	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
MIBK	UG/G-DRY	98696	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
DMS	UG/G-DRY	98697	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
BENZENE	UG/G-DRY	98699	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
O-AND/OR P-XYLENE	UG/G-DRY	98700	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
CARBON TETRACHLORIDE	UG/G-DRY	98680	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
CHLOROBENZENE	UG/G-DRY	98681	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
CHLOROFORM	UG/G-DRY	98682	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
1,1-DICHLOROETHANE	UG/G-DRY	98683	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
1,2-DICHLOROETHANE	UG/G-DRY	98684	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
BICYCLOHEPTADIENE	UG/G-DRY	98686	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
DBCP (MEMAGON)	UG/G-DRY	98652	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
DBCP	UG/G-DRY	98652	04/02/86	10:16	04/02/86	10:16	04/02/86	10:37	03/27/86	09:01	03/26/86	14:39	03/26/86	14:39	04/02/86
UNK588	UG/G	90049													
UNK615	UG/G	90071													
	UG/G	36													
	UG/G	36													

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GETSZLER

PARAMETERS	UNITS	STORET #	METHOD	5332A	5332B	5333A	5333B	5333C	5334A	5334B	5334C	5335A	5335B	5335C	5336A	5336B
		30-1	68	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
				78	79	89	90	91	100	101	102	111	112	113	122	123
				04/02/86	04/02/86	04/02/86	04/02/86	03/27/86	03/27/86	03/27/86	03/27/86	03/26/86	03/26/86	03/26/86	04/02/86	04/02/86
DATE				10:16	10:16	10:37	10:37	10:37	09:01	09:01	09:01	14:39	14:39	14:39	13:04	13:04
TIME																
UNK620	UG/G	90074														
		36														
UNK648	UG/G	90648														
		36														
UNK550	UG/G	90550														
		36														
UNK559	UG/G	90099														
		36														
UNK562	UG/G	90033														
		36														
UNK582	UG/G	90045										0.414	0.533			
		36														
UNK599	UG/G	90127										0.355				
		36														
UNK623	UG/G	90077											0.549			
		36														
UNK650	UG/G	90134														
		36														
UNK635	UG/G	90087														
		50														
UNK094	UG/G	90007														
		50														

0.482

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORER #	METHOD	DATE	TIME	5337A	5337B	5338A	5338B	5339A	5339B	5340A	5340B	5341A	5341B	5342A	5342B	5343A	
		133	134	04/11/86	13:47	13:47	13:47	13:22	13:22	13:22	13:22	12:45	12:45	08:50	08:50	08:50	08:50	08:50	12:33
		0	0	04/11/86	13:47	13:47	13:47	13:22	13:22	13:22	13:22	12:45	12:45	08:50	08:50	08:50	08:50	08:50	12:33
SAMPLE TYPE		71999	0	SO	0	0	0	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH	FT	99758A	0	0.0	0.0	0.0	0.0	4.00	4.00	0.0	4.00	0.0	4.00	0.0	4.00	0.0	4.00	4.00	0.0
SITE TYPE 1		99759	0	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
INSTALLATION CODE		99720	0	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLE		72005	0	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
SAMPLING TECHNIQUE		98392	0	186948	186948	187339	187339	187726	187726	188199	188199	188199	188199	188669	188669	188669	188669	188669	188047
COORDINATE N/S		98393	0	2191848	2191848	2193593	2193593	2193605	2193605	2193628	2193628	2193628	2193628	2193638	2193638	2193638	2193638	2193638	2193106
COORDINATE E/W		70320	0	8.9	6.6	9.0	11.0	11.0	9.8	9.8	9.1	11.8	7.0	16.9	21.1	20.2	9.3	10.9	10.9
STP		1028	0	<0.510	<0.510	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.510	<0.510	<0.510	<0.510	<0.510	<0.900
%WET WT		99584	0	<7.40	13.7	15.3	<7.20	14.6	18.1	18.1	16.4	17.7	16.2	21.1	11.9	19.0	9.40	15.9	15.9
UG/G- DRY		1043	0	9.40	13.2	14.0	14.6	15.3	30.2	30.2	27.6	32.2	28.3	<16.0	<16.0	<16.0	<16.0	<16.0	<0.900
UG/G- DRY		1052	0	<16.0	<16.0	25.9	29.1	29.1	58.4	58.4	56.0	56.1	6.34	<16.0	<16.0	<16.0	<16.0	<16.0	<0.900
UG/G- DRY		1093	0	<28.0	48.3	52.3	88.4	88.4	<4.70	<4.70	<4.70	<4.70	6.34	<16.0	<16.0	<16.0	<16.0	<16.0	<0.900
UG/G- DRY		1003	0	<5.20	<5.20	5.82	<4.70	<4.70	<0.050	<0.050	<0.050	<0.050	55.6	<16.0	<16.0	<16.0	<16.0	<16.0	<0.900
UG/G- DRY		71921	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.900
UG/G- DRY		98356	0	<0.500	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900
UG/G- DRY		98365	0	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.900
UG/G- DRY		98364	0	<2.00	<2.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00	<2.00	<2.00	<2.00	<0.900
UG/G- DRY		98369	0	<4.00	<4.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00	<4.00	<4.00	<4.00	<0.900
UG/G- DRY		98361	0	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00	<6.00	<6.00	<6.00	<0.900
UG/G- DRY			0																

PROJECT NUMBER 85937 0420 RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	DATE	TIME	5337A	5337B	5338A	5338B	5339A	5339B	5340A	5340B	5341A	5341B	5341C	5342A	5342B	5343A
DDE, PP'	UG/G-DRY	98363	04/11/86	13:47	<0.500	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.300
1,4 OXATHIANE	UG/G-DRY	98644	04/11/86	13:47	<0.500	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.300
DIMP	UG/G-DRY	98645	04/11/86	13:47	<3.000	<3.000	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.000	<3.000	<3.000	<3.000	<3.000	<0.500
VAPONA	UG/G-DRY	98646	04/11/86	13:47	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
HEXACHLOROCYCLOPENT-ADIENE	UG/G-DRY	98647	04/11/86	13:47	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000	<1.000
MALATHION	UG/G-DRY	98648	04/11/86	13:47	<2.000	<2.000	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.000	<2.000	<2.000	<2.000	<2.000	<0.600
ISODRIN	UG/G-DRY	98649	04/11/86	13:47	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.300
1,4 DITHIANE	UG/G-DRY	98650	04/11/86	13:47	<2.000	<2.000	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.000	<2.000	<2.000	<2.000	<2.000	<0.300
DICYCLOPENTADIENE	UG/G-DRY	98651	04/11/86	13:47	<6.000	<6.000	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.000	<6.000	<6.000	<6.000	<6.000	<0.300
DBCP (NEMAGON)	UG/G-DRY	98652	04/11/86	13:47	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.300
P-CLPHENYLMETHYL-SULFIDE	UG/G-DRY	98653	04/11/86	13:47	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
P-CLPHENYLMETHYL-SULFOXIDE	UG/G-DRY	98654	04/11/86	13:47	<1.000	<1.000	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.000	<1.000	<1.000	<1.000	<1.000	<0.400
ATRAZINE	UG/G-DRY	98655	04/11/86	13:47	<0.500	<0.500	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500	<0.500	<0.500	<0.500	<0.700
SUPONA	UG/G-DRY	98656	04/11/86	13:47	<0.900	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500
DMP	UG/G-DRY	98657	04/11/86	13:47	<3.000	<3.000	<2.000	<2.000	<2.000	<2.000	<2.000	<2.000	<3.000	<3.000	<3.000	<3.000	<3.000	<2.000
PARATHION	UG/G-DRY	98658	04/11/86	13:47	<2.000	<2.000	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.000	<2.000	<2.000	<2.000	<2.000	<0.700
P-CLPHENYLMETHYL-SULFONE	UG/G-DRY	98703	04/11/86	13:47	<0.400	<0.400	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400	<0.300
TRANS-1,2-DICHLOROETHENE	UG/G-DRY	98687	04/11/86	13:47	<0.500	<0.500	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500	<0.500	<0.500	<0.500	<0.700
ETHYLBENZENE	UG/G-DRY	98688	04/11/86	13:47	<0.400	<0.400	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400	<0.300
METHYLENE CHLORIDE	UG/G-DRY	98689	04/11/86	13:47	<0.400	<0.400	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400	<0.300

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	5337A	5337B	5338A	5338B	5339A	5339B	5340A	5340B	5341A	5341B	5341C	5342A	5342B	5343A	
TETRACHLOROETHENE	UG/G-DRY	98690	04/11/86	04/11/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	03/26/86	03/26/86
			13:47	13:47	13:22	13:22	13:22	13:22	12:45	12:45	08:50	08:50	08:50	08:50	08:50	08:50	12:33
TOLUENE	UG/G-DRY	98691	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
1,1,1-TRICHLOROETHANE	UG/G-DRY	98692	133	134	144	145	155	156	166	167	177	178	179	188	189	199	
ETHANE	UG/G-DRY	98693															
1,1,2-TRICHLOROETHANE	UG/G-DRY	98694															
TRICHLOROETHENE	UG/G-DRY	98695															
M-XYLENE	UG/G-DRY	98696															
MIBK	UG/G-DRY	98697															
DMDS	UG/G-DRY	98698															
BENZENE	UG/G-DRY	98699															
O-AND/OR P-XYLENE	UG/G-DRY	98700															
CARBON TETRACHLORIDE	UG/G-DRY	98680															
CHLOROBENZENE	UG/G-DRY	98681															
CHLOROFORM	UG/G-DRY	98682															
1,1-DICHLOROETHANE	UG/G-DRY	98683															
1,2-DICHLOROETHANE	UG/G-DRY	98684															
BICYCLOHEPTADIENE	UG/G-DRY	98686															
DBCP (NEMAGON)	UG/G-DRY	98652	<0.60	<0.60	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30	<0.30
DBCP	UG/G-DRY	98652	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.300
UNK588	UG/G	90049															
UNK615	UG/G	90071			0.604		0.567					2.53	1.26				

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. HITT
 30-1SG LAB COORDINATOR PAUL BEISZLER

PARAMETERS	UNITS	STORET #	5337A	5337B	5338A	5338B	5339A	5339B	5340A	5340B	5341A	5341B	5341C	5342A	5342B	5343A
UNK625	UG/G	90078	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
UNK626	UG/G	90079	133	134	144	145	155	156	166	167	177	178	179	188	189	199
UNK628	UG/G	90081	04/11/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	03/26/86
UNK631	UG/G	90083	13:47	13:22	13:22	13:22	13:22	13:22	12:45	12:45	08:50	08:50	08:50	08:50	08:50	12:33
UNK633	UG/G	90085														
UNK634	UG/G	90086	1.10	0.476	0.459	0.459	0.459	0.464	0.464	0.464	0.877	0.882	0.877	0.882	0.877	0.882
UNK636	UG/G	90088														
UNK642	UG/G	90108		0.648	0.561	0.561	0.561	0.370	0.370	0.566						0.811
UNK027	UG/G	90182														
UNK566	UG/G	90200					0.664									
UNK537	UG/G	90022														
UNK606	UG/G	90063														
UNK614	UG/G	90070		3.87	2.37	2.37	4.62	3.70	2.36	2.31						
UNK609	UG/G	90066														
UNK611	UG/G	90067														
UNK652	UG/G	90111														
UNK617	UG/G	90072														
UNK618	UG/G	90073														
UNK619	UG/G	90105														
UNK637	UG/G	90089														

ENVIRONMENTAL SCIENCE & ENGINEERING 02/17/87 STATUS:

PROJECT NUMBER 85937 0420 RMA TASK14
 PROJECT MANAGER M. WITT
 LAB COORDINATOR PAUL GEISZLER

FIELD GROUP 30-1
 30-1SC

PARAMETERS	UNITS	STORET #	METHOD	DATE	TIME	5337A	5337B	5338A	5338B	5339A	5339B	5340A	5340B	5341A	5341B	5341C	5342A	5342B	5343A
UNK620	UG/G	90074		04/11/86	13:47	133	134	144	145	155	156	166	167	177	178	179	188	189	199
UNK648	UG/G	90648		04/11/86	13:47														
UNK550	UG/G	90550		04/11/86	13:47														
UNK559	UG/G	90099		04/11/86	13:47														
UNK562	UG/G	90033		04/11/86	13:47														
UNK582	UG/G	90045		04/11/86	13:47														
UNK599	UG/G	90127		04/11/86	13:47														
UNK623	UG/G	90077		04/11/86	13:47														
UNK650	UG/G	90134		04/11/86	13:47														
UNK635	UG/G	90087		04/11/86	13:47														
UNK094	UG/G	90007		04/11/86	13:47														

0.444	0.551	0.914	0.380	0.755
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0.383

ENVIRONMENTAL SCIENCE & ENGINEERING 02/17/87 STATUS:

PROJECT NAME RMA TASK14
 PROJECT MANAGER M. WITT
 LAB COORDINATOR PAUL GEISZLER

PROJECT NUMBER 85937 0420
 FIELD GROUP 30-1
 30-1SC

PARAMETERS	UNITS	STORET #	METHOD	DATE	TIME	5343B	5344A	5344B	5345A	5345B	5345C	5346A	5346B	5347A	5347B	5348A	5348B	5348C	5349A
		200		03/26/86	12:33	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
		210		03/26/86	09:21	0.0	4.00	4.00	0.0	4.00	0.0	4.00	4.00	0.0	4.00	0.0	4.00	9.00	0.0
		221		04/11/86	09:40	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		222		04/11/86	09:40	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		223		04/11/86	09:40	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		233		04/11/86	13:00	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		243		04/02/86	14:12	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		244		04/02/86	14:12	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		255		03/26/86	10:04	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		256		03/26/86	10:04	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		265		04/02/86	15:03	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		71999		03/26/86	09:21	0.0	4.00	4.00	0.0	4.00	0.0	4.00	4.00	0.0	4.00	0.0	4.00	9.00	0.0
		99758A		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		99759		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		99720		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		72005		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		98392		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		98393		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		70320		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		1028		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		99584		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		1043		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		1052		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		1093		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		1003		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		71971		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		98356		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		98365		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		98364		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		98369		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		98361		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
		98361		03/26/86	09:21	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-ISC LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	METHOD	DATE	TIME	53438	53444	53448	5345A	5345B	5345C	53466	5347A	5347B	5348A	5348B	5348C	5349A
		200	211	221	222	223	232	233	243	244	254	255	256	265				
		03/26/86	03/26/86	04/11/86	04/11/86	04/11/86	04/11/86	04/11/86	04/02/86	04/02/86	03/26/86	03/26/86	03/26/86	04/02/86	04/02/86	03/26/86	03/26/86	04/02/86
		12:33	09:21	09:40	09:40	09:40	13:00	13:00	14:12	14:12	10:04	10:04	10:04	14:12	10:04	10:04	10:04	15:03
DDE, PP*	UG/G-DRY	98363	0	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
1,4 OXATHIANE	UG/G-DRY	98644	0	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
DIMP	UG/G-DRY	98645	0	<0.500	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
VAPONA	UG/G-DRY	98646	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
HEXACHLOROCYCLOPENTADIENE	UG/G-DRY	98647	0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MALATHION	UG/G-DRY	98648	0	<0.600	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
ISODRIN	UG/G-DRY	98649	0	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
1,4 DITHIANE	UG/G-DRY	98650	0	<0.300	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
DICYCLOPENTADIENE	UG/G-DRY	98651	0	<0.300	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00
DBCP(NEMAGON)	UG/G-DRY	98652	0	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
P-CLPHENYL METHYL-SULFIDE	UG/G-DRY	98653	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
SULFOXIDE	UG/G-DRY	98654	0	<0.400	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
ATRAZINE	UG/G-DRY	98655	0	<0.700	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
SUPONA	UG/G-DRY	98656	0	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900
DMP	UG/G-DRY	98657	0	<2.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
PARATHION	UG/G-DRY	98658	0	<0.700	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
P-CLPHENYL METHYL-SULFONE	UG/G-DRY	98703	0	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400
TRANS-1,2-DICHLOROETHENE	UG/G-DRY	98687	0															
ETHYLBENZENE	UG/G-DRY	98688	0															
METHYLENE CHLORIDE	UG/G-DRY	98689	0															

PROJECT NUMBER 85937 0420
 PROJECT NAME RMA TASK14
 PROJECT MANAGER M. HITT
 LAB COORDINATOR PAUL GEISZLER

FIELD GROUP 30-1
 30-1SG

SAMPLE ID/#

PARAMETERS	UNITS	STORET #	DATE	TIME	5343B	5344A	5344B	5345A	5345B	5345C	5346B	5347A	5347B	5348A	5348B	5348C	5349A
TETRACHLOROETHENE	UG/G-DRY	98690	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
TOLUENE	UG/G-DRY	98691	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
1,1,1-TRICHLOROETHANE	UG/G-DRY	98692	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
1,1,2-TRICHLOROETHANE	UG/G-DRY	98693	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
TRICHLOROETHENE	UG/G-DRY	98694	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
M-XYLENE	UG/G-DRY	98695	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
MIBK	UG/G-DRY	98696	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
DMS	UG/G-DRY	98697	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
BENZENE	UG/G-DRY	98699	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
O-AND/OR P-XYLENE	UG/G-DRY	98700	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
CARBON TETRACHLORIDE	UG/G-DRY	98680	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
CHLOROBENZENE	UG/G-DRY	98681	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
CHLOROFORM	UG/G-DRY	98682	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
1,1-DICHLOROETHANE	UG/G-DRY	98683	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
1,2-DICHLOROETHANE	UG/G-DRY	98684	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
BICYCLOHEPTADIENE	UG/G-DRY	98686	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
DBCP(NEMAGON)	UG/G-DRY	98652	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
DBCP	UG/G-DRY	98652	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
UNK588	UG/G	90049	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265
UNK615	UG/G	90071	03/26/86	09:21	210	211	221	222	223	232	233	243	244	254	255	256	265

1.05

0.432

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK 14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORER #	METHOD	DATE	TIME	5343B	5344A	5344B	5345A	5345B	5346B	5347A	5347B	5348A	5348B	5348C	5349A
UNK625	UG/G	90078	36	03/26/86	12:33	200	210	211	221	222	232	243	244	254	255	256	265
UNK626	UG/G	90079	36	03/26/86	09:21												
UNK628	UG/G	90081	36	03/26/86	09:21												
UNK631	UG/G	90083	36	03/26/86	09:21												
UNK633	UG/G	90085	36	03/26/86	09:21												
UNK634	UG/G	90086	36	03/26/86	09:21												
UNK636	UG/G	90088	36	03/26/86	09:21												
UNK642	UG/G	90108	36	03/26/86	09:21												
UNK027	UG/G	90182	36	03/26/86	09:21												
UNK566	UG/G	90200	36	03/26/86	09:21												
UNK537	UG/G	90022	36	03/26/86	09:21												
UNK606	UG/G	90063	36	03/26/86	09:21												
UNK614	UG/G	90070	36	03/26/86	09:21												
UNK609	UG/G	90066	50	03/26/86	09:21												
UNK611	UG/G	90067	50	03/26/86	09:21												
UNK652	UG/G	90111	50	03/26/86	09:21												
UNK617	UG/G	90072	50	03/26/86	09:21												
UNK618	UG/G	90073	50	03/26/86	09:21												
UNK619	UG/G	90105	50	03/26/86	09:21												
UNK637	UG/G	90089	50	03/26/86	09:21												

0.674

1.17

0.664

6.14

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	53498	5350A	5350B	5350C	5351A	5351B	5352A	5352B	5353A	5353B
DATE			03/28/86	03/28/86	03/28/86	03/27/86	04/02/86	04/02/86	04/02/86	04/11/86	04/11/86	04/11/86
TIME			08:44	08:44	08:44	00:00	00:00	00:00	14:40	14:40	13:21	13:21
SAMPLE TYPE		71999	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH		0	4.00	9.00	0.0	0.0	4.00	0.0	4.00	4.00	0.0	4.00
FT		99758A	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
SITE TYPE 1		0	0	0	0	0	0	0	0	0	0	0
INSTALLATION CODE		99720	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLE		0	S	S	S	S	S	S	S	S	S	S
SAMPLING TECHNIQUE		72005	0	0	0	0	0	0	0	0	0	0
COORDINATE N/S		98392	187787	187787	188565	188565	188498	188498	188498	188498	188408	188408
STP		0	2191048	2191048	2192707	2192707	2192707	2192707	2191966	2191966	2191327	2191327
COORDINATE E/W		98393	8.4	10.1	6.1	4.6	4.7	19.4	9.5	7.8	17.6	9.3
STP		0	<0.510	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.510	<0.510
MOISTURE		70320	14.1	21.5	14.3	10.6	14.5	11.1	21.4	24.9	17.1	10.7
%MET WT		0	18.0	13.2	10.1	7.84	9.35	8.65	13.3	13.6	17.3	13.1
CADMIUM		1028	20.5	33.1	21.0	<17.0	24.0	20.1	41.4	36.3	<16.0	<16.0
UG/G- DRY		0	49.6	60.6	43.5	31.5	43.8	45.2	63.8	63.9	44.2	42.9
CHROMIUM		99584	<5.20	6.47	<4.70	<4.70	<4.70	<4.70	5.91	6.24	<5.20	<5.20
UG/G- DRY		0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
COPPER		1043	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500
UG/G- DRY		0	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
LEAD		1052	<2.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00
UG/G- DRY		0	<4.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00
ZINC		1093	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
UG/G- DRY		0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ARSENIC		1003	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500
UG/G- DRY		0	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
MERCURY		71921	<2.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00
UG/G- DRY		0	<4.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00
ALDRIN		98356	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
UG/G- DRY		0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DIELDRIN		98365	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500
UG/G- DRY		0	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
DDT, PP'		98364	<2.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00
UG/G- DRY		0	<4.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00
ENDRIN		98369	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
UG/G- DRY		0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLORDANE		98361	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500
UG/G- DRY		0	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL BEISZLER

PARAMETERS	UNITS	STORET #	DATE	TIME	53498	5350A	53508	5350C	5351A	5351B	5352A	5352B	5353A	5353B
			04/02/86	15:03	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		266	03/28/86	08:44	276	277	278	287	288	298	299	309	310	
			03/28/86	08:44	08:44	08:44	08:44	08:44	00:00	00:00	14:40	14:40	13:21	13:21
DDE,PP'	UG/G-DRY	98363	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500
1,4 OXATHIANE	UG/G-DRY	98644	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500
DIMP	UG/G-DRY	98645	<3.00	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.00	<3.00
VAPONA	UG/G-DRY	98646	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
HEXACHLOROCYCLOPENTADIENE	UG/G-DRY	98647	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MALATHION	UG/G-DRY	98648	<2.00	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.00	<2.00
ISODRIN	UG/G-DRY	98649	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
1,4 DITHIANE	UG/G-DRY	98650	<2.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.00	<2.00
DICYCLOPENTADIENE	UG/G-DRY	98651	<6.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00
DBCP (NEMACOR)	UG/G-DRY	98652	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
P-CLPHEXYLMETHYL-SULFIDE	UG/G-DRY	98653	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
P-CLPHEXYLMETHYL-SULFOXIDE	UG/G-DRY	98654	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.00	<1.00
ATRAZINE	UG/G-DRY	98655	<0.500	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500
SUPONA	UG/G-DRY	98656	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900
DMMP	UG/G-DRY	98657	<3.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<3.00
PARATHION	UG/G-DRY	98658	<2.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.00	<2.00
P-CLPHEXYLMETHYL-SULFONE	UG/G-DRY	98703	<0.400	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400
TRANS-1,2-DICHLOROETHENE	UG/G-DRY	98687												
ETHYLBENZENE	UG/G-DRY	98688												
METHYLENE CHLORIDE	UG/G-DRY	98689												

PROJECT NUMBER 85937 0420 RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SC LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	DATE	TIME	5349B	5350A	5350B	5350C	5351A	5351B	5352A	5352B	5353A	5353B
TETRACHLOROETHENE	UG/G-DRY	98690	04/02/86	15:03	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
					266	276	277	278	287	288	298	299	309	310
					08:44	08:44	08:44	08:44	00:00	00:00	14:40	14:40	13:21	13:21
TOLUENE	UG/G-DRY	98691												
1,1,1-TRICHLOROETHANE	UG/G-DRY	98692												
ETHANE	UG/G-DRY	98693												
1,1,2-TRICHLOROETHANE	UG/G-DRY	98694												
TRICHLOROETHENE	UG/G-DRY	98695												
M-XYLENE	UG/G-DRY	98696												
MIBK	UG/G-DRY	98697												
DMS	UG/G-DRY	98699												
BENZENE	UG/G-DRY	98700												
O-AND/OR P-XYLENE	UG/G-DRY	98680												
CARBON TETRACHLORIDE	UG/G-DRY	98681												
CHLOROBENZENE	UG/G-DRY	98682												
CHLOROFORM	UG/G-DRY	98683												
1,1-DICHLOROETHANE	UG/G-DRY	98684												
1,2-DICHLOROETHANE	UG/G-DRY	98686												
BICYCLOHEPTADIENE	UG/G-DRY	98652												
DBCP (NEMAGON)	UG/G-DRY	98652												
DBCP	UG/G-DRY	98652												
UNK588	UG/G	90049												
UNK615	UG/G	90071												

PROJECT NUMBER 85937 0420 RMA TASK14
 FIELD GROUP 30-1 PROJECT MANAGER M. WITT
 30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	METHOD	53498	5350A	5350B	5350C	5351A	5351B	5352A	5352B	5353A	5353B
DATE				04/02/86	03/28/86	03/28/86	03/27/86	03/27/86	04/02/86	04/02/86	04/11/86	04/11/86	04/11/86
TIME				15:03	08:44	08:44	08:44	00:00	00:00	14:40	14:40	13:21	13:21
				30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
				266	276	277	278	287	288	298	299	309	310

PARAMETERS	UNITS	STORET #	METHOD	04/02/86	03/28/86	03/27/86	04/02/86	04/11/86	04/11/86
UNK625	UG/G	90078							
		36							
UNK626	UG/G	90079							
		36							
UNK628	UG/G	90081							
		36							
UNK631	UG/G	90083							
		36							
UNK633	UG/G	90085							
		36							
UNK634	UG/G	90086							
		36							
UNK636	UG/G	90088							
		36							
UNK642	UG/G	90108							
		36							
UNK027	UG/G	90182							
		36							
UNK566	UG/G	90200							
		36							
UNK537	UG/G	90022							
		36							
UNK606	UG/G	90063							
		36							
UNK614	UG/G	90070							
		36							
UNK609	UG/G	90066							
		50							
UNK611	UG/G	90067							
		50							
UNK652	UG/G	90111							
		50							
UNK617	UG/G	90072							
		50							
UNK618	UG/G	90073							
		50							
UNK619	UG/G	90105							
		50							
UNK637	UG/G	90089							
		50							

0.445

0.350

0.382

1.10

PROJECT NAME RMA TASK14
 PROJECT MANAGER M. WITT
 LAB COORDINATOR PAUL GEISZLER

PROJECT NUMBER 85937 0420
 FIELD GROUP 30-1
 30-1SG

PARAMETERS	UNITS	STORET #	METHOD	5349B	5350A	5350B	5350C	5351A	5351B	5352A	5352B	5353A	5353B
		30-1		30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
		266		276	277	278	287	288	298	299	309	310	
DATE		04/02/86	03/28/86	03/28/86	03/27/86	03/27/86	03/27/86	04/02/86	04/02/86	04/02/86	04/11/86	04/11/86	
TIME		15:03	08:44	08:44	08:44	00:00	00:00	00:00	14:40	14:40	13:21	13:21	

UNK620	UG/G	90074											
		36											
UNK648	UG/G	90648											
		36											
UNK550	UG/G	90550											
		36											
UNK559	UG/G	90099											
		36											
UNK562	UG/G	90033											
		36											
UNK582	UG/G	90045											
		36											
UNK599	UG/G	90127											
		36											
UNK623	UG/G	90077											
		36											
UNK650	UG/G	90134											
		36											
UNK635	UG/G	90087											
		50											
UNK094	UG/G	90007											
		50											

0.360

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP T14QC PROJECT MANAGER M. WITT
 30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	02/28/86		03/05/86		03/06/86		03/13/86		03/14/86		03/14/86		04/01/86		04/07/86		05/12/86		05/12/86		05/12/86		07/11/86			
			BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC
DATE TIME			3	5	6	7	8	10	11	12	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
SAMPLE TYPE		71999	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH FT		99758A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SITE TYPE 1		99759	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB
INSTALLATION CODE		99720	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLE		72005	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
SAMPLING TECHNIQUE		70320	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
MOISTURE	%WT	1028	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900
CADMIUM	UG/G- DRY	99584	11.6	14.8	14.2	15.2	11.2	12.8	12.7	12.7	12.7	12.7	11.2	11.2	11.2	10.7	10.7	14.5	14.5	10.4	10.4	8.50	8.50	8.50	8.50	8.50	8.50	8.50
CHROMIUM	UG/G- DRY	1043	9.70	9.50	10.00	10.6	9.45	9.58	10.4	9.22	9.00	9.00	9.22	9.00	9.00	9.00	9.00	16.2	16.2	11.4	11.4	10.3	10.3	10.3	10.3	10.3	10.3	10.3
COPPER	UG/G- DRY	1052	<17.0	24.1	<17.0	22.9	<17.0	<17.0	<17.0	<17.0	<17.0	<17.0	<17.0	<17.0	<17.0	<17.0	<17.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0
LEAD	UG/G- DRY	1093	43.3	48.9	47.2	51.4	43.0	47.4	44.7	43.3	39.8	39.8	43.3	42.1	42.1	36.8	36.8	42.1	42.1	36.8	36.8	34.0	34.0	34.0	34.0	34.0	34.0	34.0
ZINC	UG/G- DRY	1003	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20
ARSENIC	UG/G- DRY	71921	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070
MERCURY	UG/G- DRY	98356	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
ALDRIN	UG/G- DRY	98365	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
DIELDRIN	UG/G- DRY	98364	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
DDT, PP'	UG/G- DRY	98369	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
ENDRIN	UG/G- DRY	98361	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00
CHLORDANE	UG/G- DRY	98363	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
DDE, PP'	UG/G- DRY	98644	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00
1,4 OXATHIANE	UG/G- DRY		<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP T14QC PROJECT MANAGER M. WITT
 30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	METHOD	02/28/86		03/05/86		03/06/86		03/13/86		03/14/86		04/01/86		04/07/86		05/12/86		05/12/86		05/12/86		07/11/86	
				BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC
DIMP	UG/G-DRY	98645	0	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
VAPONA	UG/G-DRY	98646	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
HEXACHLOROCYCLOPENTADIENE	UG/G-DRY	98647	0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MALATHION	UG/G-DRY	98648	0	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
ISODRIN	UG/G-DRY	98649	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
1,4 DITHIANE	UG/G-DRY	98650	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
DICYCLOPENTADIENE	UG/G-DRY	98651	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00
DBCP (NEMAGON)	UG/G-DRY	98652	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
P-CLPHENYLMETHYL-SULFIDE	UG/G-DRY	98653	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
P-CLPHENYLMETHYL-SULFOXIDE	UG/G-DRY	98654	0	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
ATRAZINE	UG/G-DRY	98655	0	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
SUPONA	UG/G-DRY	98656	0	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900
DMMP	UG/G-DRY	98657	0	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
PARATHION	UG/G-DRY	98658	0	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
P-CLPHENYLMETHYL-SULFONE	UG/G-DRY	98703	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400
COORDINATE, N/S	STP	98392	0	3.63	3.61	3.69	3.64	2.38	1.43	0.938	1.05	0.900	NA	NA	NA	NA	0.900	NA	NA	NA	NA	NA	NA	NA	NA
COORDINATE, E/W	STP	98393	0																						
TRANS-1,2-DICHLOROETHENE	UG/G-DRY	98667	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.800	<0.800	<0.800	<0.800	<0.800	<0.800	<0.800	<0.800
ETHYLBENZENE	UG/G-DRY	98668	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400
METHYLENE CHLORIDE	UG/G-DRY	98669	0	3.63	3.61	3.69	3.64	2.38	1.43	0.938	1.05	0.900	NA	NA	NA	0.900	NA	NA	NA	NA	NA	NA	NA	NA	NA

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP T14QC PROJECT MANAGER M. MITT
 30. IHB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	METHOD	02/28/86		03/05/86		03/06/86		03/06/86		03/13/86		03/14/86		03/14/86		04/01/86		04/07/86		05/12/86		05/12/86		05/12/86		07/11/86	
				BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC
TETRACHLOROETHENE	UG/G-DRY	98690	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
TOLUENE	UG/G-DRY	98691	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
1,1,1-TRICHLOROETHANE	UG/G-DRY	98692	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
1,1,2-TRICHLOROETHANE	UG/G-DRY	98693	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
TRICHLOROETHENE	UG/G-DRY	98694	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
M-XYLENE	UG/G-DRY	98695	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
MIBK	UG/G-DRY	98696	0	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
DMS	UG/G-DRY	98697	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
BENZENE	UG/G-DRY	98699	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
O-AND/OR P-XYLENE	UG/G-DRY	98700	0	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
CARBON TETRACHLORIDE	UG/G-DRY	98680	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
CHLOROBENZENE	UG/G-DRY	98681	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
CHLOROFORM	UG/G-DRY	98682	0	0.748	0.946	1.10	0.989	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615	0.615
1,1-DICHLOROETHANE	UG/G-DRY	98683	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
1,2-DICHLOROETHANE	UG/G-DRY	98684	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
BICYCLOHEPTADIENE	UG/G-DRY	98686	0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
UNK525	UG/G	90016	36	0.951																									
UNK529	UG/G	90018	36	0.572																									
UNK534	UG/G	90114	36	0.839																									
UNK538	UG/G	90123	36																										

PROJECT NUMBER 85937 0420 RMA TASK14
 PROJECT MANAGER M. WITT
 LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	METHOD	02/28/86		03/05/86		03/06/86		03/13/86		03/14/86		04/01/86		04/07/86		05/12/86		05/12/86		07/11/86			
				BLK T14QC	3	BLK T14QC	5	BLK T14QC	6	BLK T14QC	7	BLK T14QC	8	BLK T14QC	10	BLK T14QC	11	BLK T14QC	12	BLK T14QC	13	BLK T14QC	54	BLK T14QC	56
UNK540	UG/G	90198		18.3																					
		36																							
UNK542	UG/G	90024		20.0																					
		36																							
UNK545	UG/G	90027		1.19																					
		36																							
UNK550	UG/G	90550																							
		36																							
UNK551	UG/G	90095																							
		36																							
UNK558	UG/G	90098		0.360																					
		36																							
UNK562	UG/G	90033																							
		36																							
UNK566	UG/G	90200		0.966																					
		36																							
UNK582	UG/G	90045																							
		36																							
UNK586	UG/G	90047		0.423																					
		36																							
UNK588	UG/G	90049		25.7																					
		36																							
UNK603	UG/G	90060																							
		36																							
UNK604	UG/G	90061																							
		36																							
UNK608	UG/G	90065																							
		36																							
UNK609	UG/G	90066																							
		36																							
UNK613	UG/G	90069																							
		36																							
UNK614	UG/G	90070		7.62																					
		36																							
UNK615	UG/G	90071																							
		36																							
UNK617	UG/G	90072																							
		36																							
UNK619	UG/G	90105																							
		36																							

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
 FIELD GROUP T140C PROJECT MANAGER M. WITT
 30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	02/28/86		03/05/86		03/06/86		03/13/86		03/14/86		04/01/86		04/07/86		05/12/86		05/12/86		05/12/86		07/11/86	
			BLK T140C	UG/G	BLK T140C	UG/G	BLK T140C	UG/G	BLK T140C	UG/G	BLK T140C	UG/G	BLK T140C	UG/G	BLK T140C	UG/G	BLK T140C	UG/G	BLK T140C	UG/G	BLK T140C	UG/G	BLK T140C	UG/G
UNK569	UG/G	90038																						
		36																						
UNK573	UG/G	90100																						
		36																						
UNK575	UG/G	90121																						
		36																						
UNK576	UG/G	90040																						
		36																						
UNK577	UG/G	90041																						
		36																						
UNK578	UG/G	90042																						
		36																						
UNK579	UG/G	90043																						
		36																						
UNK580	UG/G	90044																						
		36																						
UNK583	UG/G	90046																						
		36																						
UNK584	UG/G	90115																						
		36																						
UNK585	UG/G	90102																						
		36																						
UNK587	UG/G	90048																						
		36																						
UNK591	UG/G	90051																						
		36																						
UNK592	UG/G	90103																						
		36																						
UNK593	UG/G	90052																						
		36																						
UNK594	UG/G	90053																						
		36																						
UNK595	UG/G	90054																						
		36																						
UNK598	UG/G	90056																						
		36																						
UNK600	UG/G	90057																						
		36																						
UNK601	UG/G	90058																						
		36																						

8.63

PROJECT NUMBER 85937 0420
 FIELD GROUP T14QC
 30. IRB

PROJECT NAME RMA TASK14
 PROJECT MANAGER M. HITT
 LAB COORDINATOR PAUL GEISZLER

SAMPLE ID/#

PARAMETERS	UNITS	STORET #	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK OPSD
DATE			07/11/86	07/11/86	05/04/86	04/02/86	
TIME			00:00	00:00	00:00	00:00	
DIMP	UG/G-DRY	98645	<3.00	<3.00	<3.00	<0.500	
VAPONA	UG/G-DRY	98646	<0.300	<0.300	<0.300	<0.300	
HEXACHLOROCYCLOPENTADIENE	UG/G-DRY	98647	<1.00	<1.00	<1.00	<1.00	
MALATHION	UG/G-DRY	98648	<2.00	<2.00	<2.00	<0.600	
ISODRIN	UG/G-DRY	98649	<0.600	<0.600	<0.600	<0.300	
1,4 DITHIANE	UG/G-DRY	98650	<2.00	<2.00	<2.00	<0.300	
DICYCLOPENTADIENE	UG/G-DRY	98651	<6.00	<6.00	<6.00	<0.300	
DBCP(NEMAGON)	UG/G-DRY	98652	<0.600	<0.600	<0.600	<0.300	
P-CLPHENYLMETHYL-SULFIDE	UG/G-DRY	98653	<0.300	<0.300	<0.300	<0.300	
P-CLPHENYLMETHYL-SULFOXIDE	UG/G-DRY	98654	<1.00	<1.00	<1.00	<0.400	
ATRAZINE	UG/G-DRY	98655	<0.500	<0.500	<0.500	<0.700	
SUPONA	UG/G-DRY	98656	<0.900	<0.900	<0.900	<0.500	
DIMP	UG/G-DRY	98657	<3.00	<3.00	<3.00	<2.00	
PARATHION	UG/G-DRY	98658	<2.00	<2.00	<2.00	<0.700	
P-CLPHENYLMETHYL-SULFONE	UG/G-DRY	98703	<0.400	<0.400	<0.400	<0.300	
COORDINATE, N/S	STP	98392					
COORDINATE, E/W	STP	98393					
TRANS-1,2-DICHLOROETHENE	UG/G-DRY	98687	<0.800			<0.300	
ETHYLBENZENE	UG/G-DRY	98688	<0.400			<0.300	
METHYLENE CHLORIDE	UG/G-DRY	98689	NA			4.92	

PROJECT NAME RMA TASK14
 PROJECT MANAGER M. WITT
 LAB COORDINATOR PAUL GEISZLER

PROJECT NUMBER 85937 0420
 FIELD GROUP T140C
 30. IMB

SAMPLE ID/#

PARAMETERS	UNITS	STORET #	BLK T140C	BLK T140C	BLK T140C	BLK T140C	BLK T140C	BLK OPSED
DATE			07/11/86	07/11/86	07/11/86	05/04/86	04/02/86	
TIME			00:00	00:00	00:00	00:00	00:00	00:00

UNK569	UG/G	90038						
		36						
UNK573	UG/G	90100						
		36						
UNK575	UG/G	90121						
		36						
UNK576	UG/G	90040						
		36						
UNK577	UG/G	90041						
		36						
UNK578	UG/G	90042						
		36						
UNK579	UG/G	90043						
		36						
UNK580	UG/G	90044						
		36						
UNK583	UG/G	90046						
		36						
UNK584	UG/G	90115						
		36						
UNK585	UG/G	90102						
		36						
UNK587	UG/G	90048						
		36						
UNK591	UG/G	90051						
		36						
UNK592	UG/G	90103						
		36						
UNK593	UG/G	90052						
		36						
UNK594	UG/G	90053						
		36						
UNK595	UG/G	90054						
		36						
UNK598	UG/G	90056						
		36						
UNK600	UG/G	90057						
		36						
UNK601	UG/G	90058						
		36						

PROJECT NAME RMA TASK14
PROJECT MANAGER M. HITT
LAB COORDINATOR PAUL GEISZLER

PROJECT NUMBER 85937 0420
FIELD GROUP T14QC
30.1MB

SAMPLE ID/#

PARAMETERS	UNITS	STORET #	METHOD	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK T14QC	BLK OPSED
DATE				66	68	69	81	80	
TIME				07/11/86 00:00	07/11/86 00:00	07/11/86 00:00	05/04/86 00:00	04/02/86 00:00	

UNK664 UG/G 90154
36

STATE OF COLORADO

COLORADO DEPARTMENT OF HEALTH

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



October 22, 1987

Roy Romer
Governor

Thomas M. Vernon, M.D.
Executive Director

Mr. Donald Campbell
Program Manager's Office
RMA Contamination Cleanup
Department of the Army
Aberdeen Proving Grounds
Maryland 21010-5401

Dear Mr. Campbell:

Enclosed are the state's comments on Task 2, 7, 12, 14 and 15 Draft Phase I Contamination Assessment Reports (CARs) for the following sites:

Task 2

Site 1-3 Mounded Material

Task 7

Site 3-1/3-3 Drainage Ditch and Overall Basin
Site 24-7 North Bog

Task 12

Site 12-1 Buried Lake Sludge

Task 14

Site 4-5 Disposal Trenches
Site 30-1 Impact Area
Site 30-5 M-34 Demilitarization Area

Task 15

Site 4-2 Burning Pit

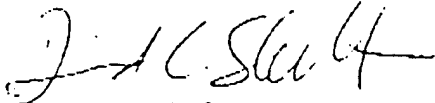
Our principle concerns with the reports are that the representation of the extent of contamination in the CAR is severely underestimated, and that the implementation of the remaining Phase I plans as proposed and the proposed Phase II programs will not adequately define the nature and extent of contamination. The plans should be modified to fully define the nature and extent of soil contamination in these sites, and to be consistent with the requirements of the National Contingency Plan for the conduct of remedial investigations.

Mr. Don Campbell
October 22, 1987
Page Two

The state's comments are subject to change pending the review of the recently obtained 1986 third and fourth quarter GC/MS ground water data.

If you have any questions on the enclosed comments, please contact Jeff Edson.

Sincerely,



David C. Shelton
Director
Hazardous Materials and
Waste Management Division

DCS:nr

cc: Dave Strang, RMA
Ken Conright, Tri-County Health Dept.
Beth Gallegos
Larry Ford, SACWSU
Howard Kenison, Attorney General's Office
Robert Duprey, U.S. EPA
Chris Hahn, Shell Oil Company
Thomas Bick, U.S. Department of Justice
Major Scott Isaacson, Department of the Army
Edward McGrath, Holme, Robert & Owen

01/18/88

RESPONSE TO PRECEEDING GENERAL COMMENT
OF THE STATE OF COLORADO ON THE
TASK 14 DRAFT FINAL REPORT
SITE 30-1: IMPACT AREAS

Response:

The objectives of the Phase I programs as performed and the Phase II programs as planned have been previously presented and explained in the various Technical Plans, the Introduction to the CARs, and successive CAR review meetings. Based on the collective results of the investigative techniques outlined in these references, the nature and extent of contamination have been assessed using the most conclusive data available and best professional judgement. All available historical information, aerial photograph interpretations, geophysical surveys, and chemical analysis results have been used to define the vertical and lateral extent of contamination. Phase I and Phase II boring placements and chemical analyses are intended to provide the most effective procedures of collecting meaningful data on which to base estimates of contamination. The technical plans and investigative techniques for this soil contamination assessment have been presented for comment to EPA, and investigations have been modified, where needed, in accordance with EPA requirements. In addition, all Remedial Investigations (RI) have implemented technical programs consistent with the National Contingency Plan, and CERCLA guidelines for the conduct of RI at hazardous waste sites.

We feel that the RI programs being conducted will adequately define the nature and extent of contamination at RMA and provide meaningful data upon which a Feasibility Study (FS) and future remedial actions can be based. In the event that data gaps still exist at the completion of the Phase II program, further investigative techniques will be pursued to fill such gaps.

In all cases, based on the data presented, the most conservative estimate of contamination has been developed. A revised estimate will be provided at the conclusion of the Phase II program which will more accurately define the extent of contamination at any given site. All estimates are, of course, dependent on final settlement of preliminary pollutant limit values (PPLV) for contaminants at RMA.

01/15/88

RESPONSE TO GENERAL COMMENTS OF
OCTOBER 22, 1987 FROM
COLORADO DEPARTMENT OF HEALTH
PERTAINING TO ALL PHASE I
CONTAMINATION ASSESSMENT REPORTS (CARS)

Comment 1: Potential action levels for organic and inorganic analytes in the soils may be lower than detection limits used in the Phase I program. Contingencies must be made to re-investigate all sites if action levels warrant lower detection limits.

Response: The Phase I soil investigations utilized certified analytical methods that were developed to minimize the detection limit while allowing the Army to analyze for a wide range of pertinent analytes in a large number of samples. Specific Phase II analytical methods are then utilized to further define the extent of contamination suggested by the Phase I analysis. Phase II methods use specific compound detection devices to reduce the detection limit of any particular compound to the lowest level which is technically achievable, while maintaining a degree of confidence in results which is legally defensible.

Because of the complexity in defining action levels and the lengthy review required to establish tentative levels, this specific issue was placed under consideration by the "How Clean is Clean" committee. Rather than delay the RI 3 to 4 years in order to further define and substantiate the action levels, the program was allowed to proceed, but with some recognized risk. As previously stated to all MOA parties, further remedial investigations may be required to address the final action levels.

Comment 2: There are numerous, reoccurring, non-target analytes found in many sites. A formal process must be presented to determine whether non-target analytes belong on target analyte lists. Furthermore, target analytes may need to be determined on a source by source (or section by section basis), rather than on an "Arsenal-wide" basis. Revised target analytes programs should be implemented in the Phase II program.

Response: The Phase II target analyte list for each site investigated is based on available Phase I results, including target and nontarget detections. MOA parties, including representatives from the Colorado Department of Health (CDH), review these data and the nontarget

01/18/88

results regularly to determine that significant nontarget compounds are being adequately addressed in Phase II. Comments received from MOA that are specific in nature are carefully considered by the Army. In each site investigation, the Army reviews nontarget data and MOA comments in order to ascertain the necessity of further defining the extent of a Phase I nontarget compound. In addition, a committee comprised of RI and FS team members is systematically evaluating all nontarget compounds detected during the RI program.

Although this technical review process is subjective, serious candidates for inclusion on the target list have included: those compounds which occur frequently or in a pattern; compounds of high concentrations; high toxicity compounds; carcinogenic compounds; and compounds that may be considered as byproducts or degradation products of target compounds. Compounds such as benzothiazole and several Army agent degradation products were added to the Phase II target list as a result of this review process. In each case, the Army has provided ample opportunity to every party to formally document any serious concern regarding the Phase II target analyte program.

Comment 3:

For sites where contaminants have been detected in the unsaturated zone at the water table, the Phase II program must sample the saturated zone. These borings will determine the vertical extent of source-related contaminants and provide insight into potential ground-water contamination.

Response:

The intent of the Phase I soil investigations as described in the various technical plans submitted to the MOA parties was to identify and quantify contamination in the unsaturated zone. Therefore, sampling was restricted to intervals at or above the water table. In addition to the soil program, the Army has conducted an extensive program of surface and ground water monitoring at RMA. Soils information will be evaluated in conjunction with information gathered during the various water analytical programs that have been conducted. Evaluation of soil contamination with respect to surface and ground water monitoring results will be presented in the Study Area Reports to be issued to MOA parties. In some instances, the Phase II program will sample intervals at or below the water table at locations within each site suspected of contributing to aquifer contamination. Contaminant concentrations in these soil samples, if detected, will also be compared against local ground water quality data.

01/15/88

Comment 4:

The Army has labeled many non-target analytes found in the soils as a laboratory induced contamination. Little, if any, information is presented to support this determination. Many of these contaminants have been found in concentrations too high to be indicative of laboratory contamination (e.g., methylene chloride 800 ppm, Site 4-5). Further, many laboratory batches that exhibit "laboratory contamination" have clean laboratory blanks.

If laboratory induced contamination overwhelms the GC/MS screen, the chemical analysis program becomes suspect and must be re-evaluated. Further, a procedure for documenting the identification and verification of suspected laboratory contaminants must be presented.

Response:

A position paper concerning contaminants which are listed as "laboratory induced" is currently in preparation and will be released to MOA parties upon completion.

01/15/88

RESPONSES TO SPECIFIC COMMENTS OF THE
COLORADO DEPARTMENT OF HEALTH ON THE
DRAFT FINAL TASK 14 REPORT
SITE 30-1: IMPACT AREAS (VERSION 2.2)

Comment_1:
p.7

The statement that the 10 ppb endrin value was not substantiated in the Task 4 ISP contradicts the findings in the ISP report which indicates an endrin concentration of 10 ppb in monitoring Well 30005.

Response

The statement concerning the 10 ppb endrin value in Well 30004 from the RMA database has been corrected to a 10 ppb endrin value in Well 30005 in the Task 4 ISP Report.

Comment_2:
is not p. 14

Figure 30-1-6 indicates that the Old Sanitary Landfill included as part of the Site 30-4 Landfill, but is part of Site 30-1. However, the Army did not investigate the Old Sanitary Landfill area pursuant to the Site 30-1 Phase I Technical Plan. Similarly, the Task 7 - Site 30-4 CAR did not include the Old Sanitary Landfill area in its investigation. A program must be initiated to define the nature and extent of any contamination in this area.

Response

The 1984 RMACCPMT map (RIC#84034R01) was the basis of all Phase I soil investigations, and Site 30-4 (Sanitary Landfill) boundaries. During the Site 30-1 geophysical investigation, intense magnetic and EM inphase response indicated the location of the Old Sanitary Landfill. The nature and extent of contamination in the Old Sanitary Landfill as well as the locations of the six soil borings in this area are presented in the Site 30-4 CAR (Task 7).

Shell Oil Company



c/o Holme Roberts & Owen
Suite 1800
1700 Broadway
Denver, CO 80290

June 24, 1987

USATHAMA
Office of the Program Manager
Rocky Mountain Arsenal Contamination Cleanup
ATTN: AMXRM-EE: Chief: Mr. Donald L. Campbell
Bldg E4585, Trailer
Aberdeen Proving Ground, MD 21010-5401

Dear Mr. Campbell:

Enclosed herewith are Shell Oil's comments on the Draft Final Contamination Assessment Reports for sites 19-UNC, 22-UNC, 27-UNC, and 30-1 assessed under Task 14.

Very truly yours,

A handwritten signature in cursive script, appearing to read "C. K. Hahn".

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 E4585, Trailer
Aberdeen Proving Ground, MD 21010-5401

USATHAMA
Office of the Program Manager
Rocky Mountain Arsenal Contamination Cleanup
ATTN: PMSO: Mr. Brian L. Anderson
Aberdeen Proving Ground, MD 21010-5401

-2-

cc: Mr. Thomas Bick
Environmental Enforcement Section
Land & Natural Resources Division
U.S. Department of Justice
P.O. Box 23896
Benjamin Franklin Station
Washington, D.C. 20026

Mr. Scott Isaacson
Headquarters - Department of the Army
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Mr. Chris Sutton
Colorado Department of Health
4210 East 11th Avenue
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Mr. Robert L. Duprey
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One Denver Place
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Mr. Connally Mears
U.S. Environmental Protection Agency, Region VIII
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Mr. Thomas P. Looby
Assistant Director
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

01/26/88

**RESPONSES TO SPECIFIC COMMENTS OF THE
SHELL OIL COMPANY ON THE
DRAFT FINAL TASK 14 REPORT
SITE 30-1: IMPACT AREAS (VERSION 2.2)**

Comment 1:
Page iv, 9
first paragraph

Two firing stations for the Site 30-1 mortar impact area are shown on RMA Drawings D-748, 4.2 inch Mortar Range, June 4, 1948 and AG-7, Area Map, Observation Post-Bldg 853, Mortar Range, 4-26-45. One station (map D-748) is located alongside "C" Street in Section 26. The concrete firing emplacements are clearly visible at this station today. A "short range firing house" is shown on Drawing AG-7 located along the eastern boundary of Section 30 directly west of Site 30-1.

The legend on Drawing AG-7 indicates that Site 30-1 may also have been used for testing incendiary (M69X) bombs. A "test stand" is shown which is located 300 ft northeast of the Observation Post Building 853.

Response

Drawings D-748 and AG-7 have been reviewed and evaluated for additional information relevant to the Site 30-1 investigation. The observation post locations have been included in Section 2.0. The "Short Range Mortar Firing House" is on the western boundary of Section 30 directly west of Site 30-1. Mortar fire is shown to follow a due east trajectory and would impact approximately 750 ft north of the Observation Post Building 853. The path corresponds to the primary impact area as determined from the Phase I investigation. A test stand possibly used for testing M69X bombs is 300 ft northeast of the observation bunker on Drawing AG-7. The test stand was not observed in the field, and no physical indications of drop testing activities in this area are evident. Site 36-2 is reported to have proof-tested M69 bomblets, although all activities were documented to occur within Building 725. The test stand described on Drawing AG-7 was either never constructed or used, or used and removed with no resultant wastes.

Comment 2:
paragraph 3.3
first bullet

Testing for IMPA will provide information on only one of the Army's potential degrading products. It is recommended all other Army degradation products which have certified methods also be checked during the analyses.

Response

IMPA (GB degradation products) and TDGCL (mustard degradation products) are two of the specific certified methods to detect Army agent degradation products. Both analyses are scheduled for Phase II samples from trenches, as are ICP metals, arsenic,

mercury, and semivolatile organic compound analysis. The semivolatile method is certified for the detection of DIMP, DMMP, oxathiane, and dithiane. The Phase II program as designed will provide complete information on agent degradation products, and the nontarget analysis should identify other compounds indicative of contamination. It should be noted, however, that no history of agent contaminated material is documented for this site.

Comment 3:
paragraph 3.4

As with most of the post-Phase I contaminated soil volume revisions, the volume calculated for Site 30-1 is arbitrary and misleading. The boundary drawn for the "main impact area" is arbitrary. Undoubtedly there are UXO's outside this area which, because of their lower spatial density in a larger area than the "main impact area", will result in a relatively larger quantity of potentially contaminated soil to be handled.

Response

The boundary drawn for the main impact area has been determined from the RMACCPMT map, and supported by field reconnaissance and visual evidence. The volume of potentially contaminated soil has been estimated from chemical analysis results, geophysics, and historical research. Based on the Phase I investigation of the site, this estimate of potentially contaminated soil provides accurate information upon which to base feasibility assessments.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

999 18th STREET—SUITE 500

DENVER, COLORADO 80202-2405

REF: 8HWM-SR

OCT 14 1987

Colonel W. N. Quintrell
Program Manager
AMXRM-EE Department of the Army
U.S. Army Toxic and Hazardous Materials Agency
Building 4460
Aberdeen Proving Ground, MD 21010-5401

Re: Rocky Mountain Arsenal (RMA),
Documentation of suspected laboratory
contamination.

Dear Colonel Quintrell:

EPA Region VIII has the enclosed preliminary comments for Sites 4-6,
24-6, 2-8, 3-4, and supplemental comments on Sites 30-1, and 4-5 from our
contractors. Our contact on this matter is Mr. Connally Mears at
(303) 293-1528.

Sincerely yours,

A handwritten signature in black ink, appearing to read "R. Duprey", written over a horizontal line.

Robert L. Duprey, Director
Hazardous Waste Management Division

Enclosure

cc: David Shelton, CDH
Chris Hahn, Shell Oil Company
R. D. Lundahl, Shell Oil Company
Thomas Bick, Department of Justice
Elliott Laws, Department of Justice
Preston Chiaro, Ebasco
Mike Witt, ESE



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

999 18th STREET—SUITE 500

DENVER, COLORADO 80202-2405

REF: 8HWM-SR

SEP 23 1987

Colonel W. N. Quintrell
Program Manager
AMXRM-EE Department of the Army
U.S. Army Toxic and Hazardous Materials Agency
Building 4460
Aberdeen Proving Ground, MD 21010-5401

Re: Rocky Mountain Arsenal (RMA),
Review of Final Phase I CAR Report for
Task 14, Site 30-1, Impact Area.

Dear Colonel Quintrell:

EPA Region VIII has reviewed the above referenced final report and has the enclosed preliminary comments from our contractors. Given the status of Phase II Remedial Investigation work at this site and the nature of the enclosed comments, it may be that our concerns can be addressed during the Feasibility Study for RMA. If you wish to pursue that option, please call Mr. Connally Mears at (303) 293-1528.

Sincerely yours,

A handwritten signature in black ink, appearing to read "R. Duprey", written over a horizontal line.

Robert L. Duprey, Director
Hazardous Waste Management Division

Enclosure

cc: David Shelton, CDH
Chris Hahn, Shell Oil Company
R. D. Lundahl, Shell Oil Company
Thomas Bick, Department of Justice
Elliott Laws, Department of Justice
Preston Chiaro, Ebasco
Mike Witt, ESE

RESPONSES TO SPECIFIC COMMENTS
OF ENVIRONMENTAL PROTECTION
AGENCY ON THE DRAFT FINAL
TASK 14 REPORT
SITE 30-1: IMPACT AREA (VERSION 2.2)

Comment 1: The small drainage channel crossing through the southwest quadrant of the site should be shown on Figures 30-1-6 through 30-1-8. Are reholes 5330, 5331, and 5337 located in this channel? If so, the report should so state. If not, Phase II should sample this channel.

Response The small drainage has been added to Figures 30-1-6 thru 30-1-8. Boring 5347 was placed within this drainage.

Comment 2: Why wasn't a boring located in the mounded area adjacent to Boring 5330? Are these mounds from excavating the nearby trench, or are they burying something?

Response Field inspection of the mounds near Boring 5330 did not reveal any visual indications of disposal activity or debris. These mounds are the result of initial trench excavation based on proximity to the trenches and lack of visual soil contamination.

Comment 3: Why were no borings placed in the area labeled "Abundant Metal Debris" in the south central portion of the site?

Response No borings were placed in the area of "Abundant Metal Debris" based on results of a surface sweep of the area. Personnel with extensive knowledge of ordnance used and stored at RMA investigated the area, and recorded only innocuous metal surface debris.

Comment 4: The report states that the tentatively identified compound diethylene glycol occurred only in Lot BMS, and was therefore attributed to laboratory contamination. However, the three borings that it occurred in were all located in the same general vicinity and may not be laboratory induced since it did not appear in the blanks analysis. Therefore, diethylene glycol should be added to the analyte list for the Phase II borings.

Response Diethylene glycol (2,2'-oxybisethanol) is a common component of commercially available antifreeze. The compound was detected in three borings that were all in the same general vicinity. This compound was identified in several other Task 14 sites as well. All of these borings were drilled in the winter

01/26/88

months, when antifreeze may be used for field vehicles and equipment. Antifreeze is used overnight in the steam cleaner line and may have bled out of the line before decontamination procedures. Incomplete bleeding of the line may have contaminated both field equipment and the samples. Phase II borings proposed for this site include a GC/MS scan, which will detect diethylene glycol in the nontarget analysis.

Comment 5:

Numerous contamination assessment reports dismiss low concentrations of tentatively identified compounds and one target analyte (methylene chloride) as a "suspected laboratory contaminant". When analysis of the blanks do not support this conclusion, we feel the reports should substantiate the assertion with additional documentation from the laboratory QA/QC program. Several examples of hits dismissed as suspected laboratory contamination without supporting documentation are cited below.

Site	Boring(s)	Compound	Concentration
4-6	19	methylene chloride	3
30-1	5335, 5338, 5339	oxy-bis ethanol	0.5, 0.8, 0.9
24-6	4,11	methylene chloride	2, 3
2-8	6	methylene chloride	6 (No data on BLANKS)
3-4	3, 7, 8, 14	methylene chloride	1 - 5
4-5	11, 2, 10	methylene chloride	800, 50, 2

Response:

A position paper on "laboratory introduced" contamination is currently being assembled and will be presented to MOA parties upon completion.