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FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

NUS CORPORATION
SUPERFUND DIVISION

ORIGINAL
(Red)

R-585-6-0-37

SITE INSPECTION OF
CROWN CENTRAL PETROLEUM
PREPARED UNDER

TDD NO. F3-9003-08
EPA NO. MD-113
CONTRACT NO. 68-01-7346

FOR THE

HAZARDOUS SITE CONTROL DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

DECEMBER 27, 1990

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY	REVIEWED BY	APPROVED BY
for		
RICHARD COSTELLO	MICHAEL HEFFRON	GARTH GLENN
PROJECT MANAGER	SECTION SUPERVISOR	REGIONAL MANAGER, FIT 3

ORIGINAL (Red)

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SECTION 1

1.0 INTRODUCTION

1.1 Authorization

NUS Corporation performed this work under Environmental Protection Agency Contract No. 68-01-7346. This specific report was prepared in accordance with Technical Directive Document No. F3-9003-08 for the Crown Central Petroleum site, located in Baltimore, Maryland.

1.2 Scope of Work

NUS FIT 3 was tasked to conduct a site inspection of the subject site.

1.3 Summary

The Crown Central Petroleum site is located in Baltimore, Maryland. Crown Central Petroleum owned the property from 1947 until 1968. The property was unused from 1968 until 1970, when Crown Central Petroleum leased the site to Petroleum Marketing Corporation, a subsidiary of Petroleum Fuel and Terminal Corporation. Petroleum Marketing Corporation purchased the property in 1973 and operated the site until April 1978, when Petroleum Fuel and Terminal Corporation, the current owner and occupant, purchased the facility.

During the years that Crown Central Petroleum operated the site, it was a common industry practice to dispose leaded tank bottoms by weathering and burial pits. The locations of the weathering areas and burial pits are not known.

Fuel storage tanks of various capacities occupy a major portion of the site. Fourteen tanks were originally owned by Crown Central Petroleum. Since 1978, six new tanks have been erected. Two on-site oil/water separators discharge to the Patapsco River under an NPDES permit. One separator, located in the northern half of the site, discharges directly to the Patapsco River. The other separator, located in the southern half of the site, empties into a storm sewer that underlies the facility. The storm sewer discharges into the Patapsco River.

The Maryland Waste Management Administration (MD WMA) performed a preliminary assessment in September 1983. MD WMA found no weathering area or burial pits on site.

Drinking water for the study area is supplied by the City of Baltimore Water Department (CBWD), serving approximately 1.6 million people. CBWD obtains its water from (b) (9) [redacted] CBWD also maintains a surface water intake on (b) (9) [redacted] All individuals not served by a water company are assumed to maintain private domestic wells. Based on available data, however, no water supply wells are located in the study area.

NUS FIT 3 conducted a site inspection of the Crown Central Petroleum site on April 10, 1990. Subsurface soil and aqueous samples were collected. Soil samples revealed notable levels of lead, arsenic, polychlorinated biphenyls (PCBs), and the common constituents of gasoline (benzene, toluene, ethylbenzene, and xylenes). Samples collected from the discharge of the two on-site oil/water separators also revealed elevated levels of lead, PCBs, and the common constituents of gasoline. The results of the sampling and a discussion of the toxicological aspects can be found in sections 7.0 and 8.0, respectively.

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SECTION 2

2.0 THE SITE

2.1 Location

The Crown Central Petroleum site is located in Baltimore, Maryland (see figure 2.1, page 2-2). The property can be located on the Baltimore East, Maryland 7.5 minute series United States Geological Survey (U.S.G.S.) quadrangle topographic map at 39° 16" 24' latitude and 76° 35" 45' longitude. As measured from the southwestern corner of the Baltimore East topographic map, the site is approximately 8.5 inches east and four inches north.[1]

2.2 Site Layout

The eight-acre Crown Central Petroleum site is situated in a heavily industrialized area of Baltimore, Maryland (see figure 2.2, page 2-3). The main terminal is bordered to the north by Danville Avenue and to the east by South Clinton Street. The Patapsco River borders the site to the west, and a former Gulf Oil fuel terminal is located in the southern portion of the site. The majority of the site is covered with storage tanks containing No. 2 and No. 6 fuel oil and unleaded gasoline.[2,3]

An office building is located at the entrance to the site. The first floor of the building houses the offices of Petroleum Fuel and Terminal Corporation, and the second floor is occupied by an engineer consulting company. A foam collection building is located south of the office building.[2,3]

The main terminal contains 15 above-ground storage tanks of various sizes and capacities. Tank nos. 3, 4, and 5 sit on concrete decks that are below surface elevation. The tanks are surrounded by a one-foot-thick concrete diking wall and are located west of the office building.[2,3]

Tank nos. 1 and 2 are located northwest of the office building. Each tank is enclosed by an outer steel shell. Bentonite covers the area between the tank wall and the outer shell. North of tank no. 2 is a fuel metering building. A truck loading rack is located east of tank no. 2.[2,3]

Six tanks of various capacities are located north and west of the office building. The tanks are surrounded by earthen dikes, except tank no. 6, which is surrounded by a concrete dike wall. A vapor recovery station is located west of the office building, near tank no. 7.[2,3]

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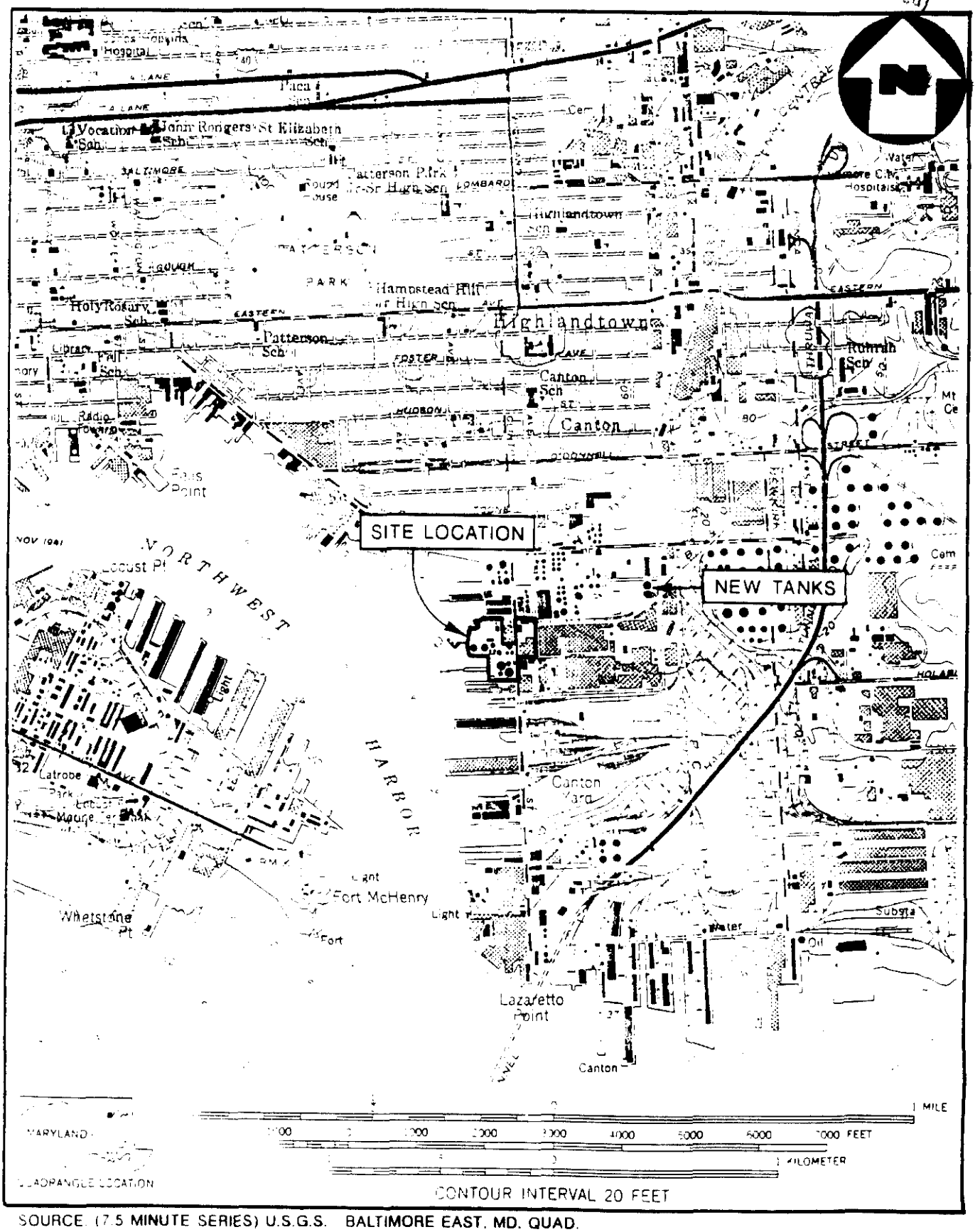

SOURCE: (7.5 MINUTE SERIES) U.S.G.S. BALTIMORE EAST, MD. QUAD.

SITE LOCATION MAP

CROWN CENTRAL PETROLEUM

SCALE 1: 24000

FIGURE 2.1

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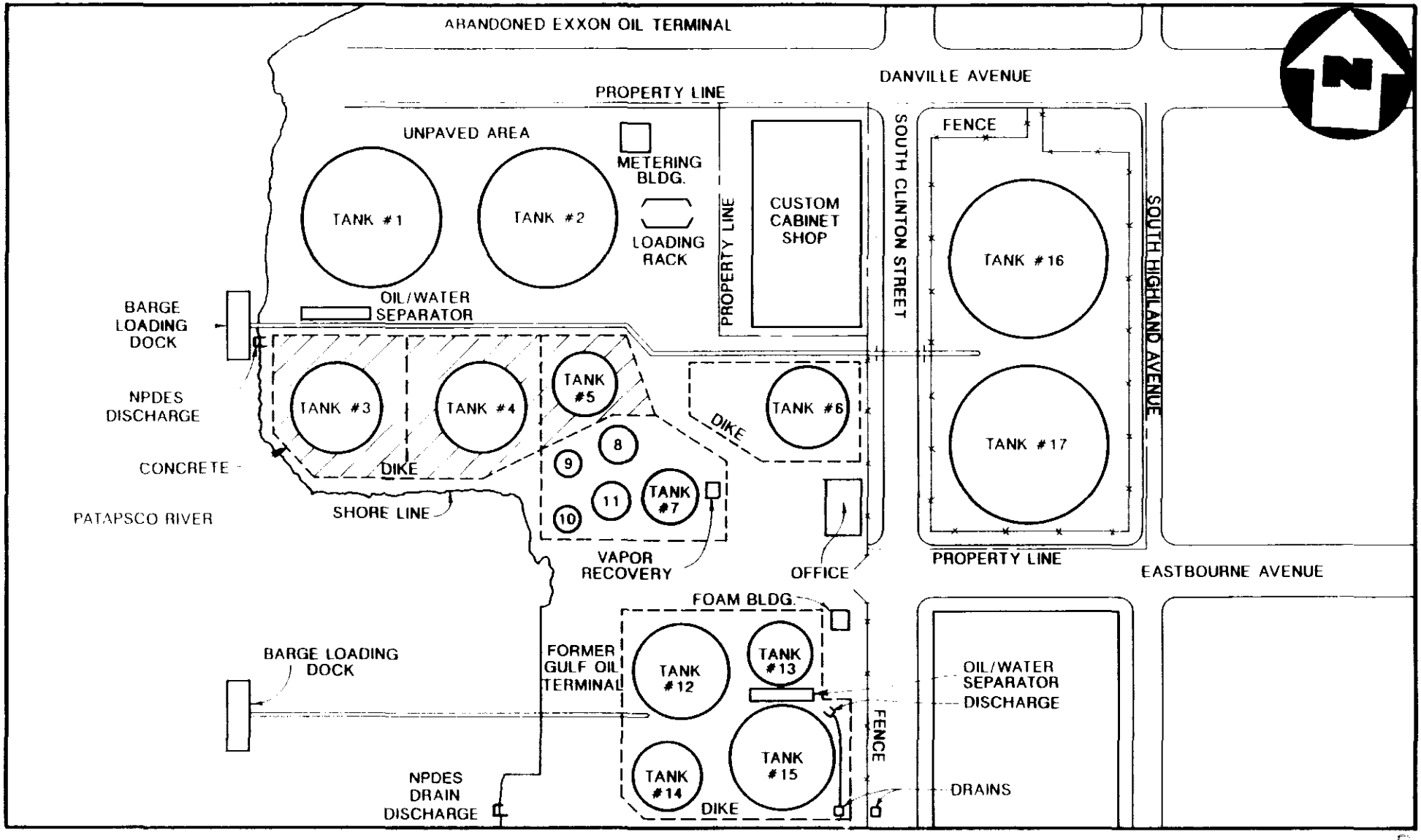

SITE SKETCH

CROWN CENTRAL PETROLEUM

(NO SCALE)

FIGURE 2.2

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An additional 4 tanks originally owned by Crown Central Petroleum are located south of the office building and are contained by 14-foot-high concrete dike walls.[2,3]

An oil/water separator is located near tank no. 1 at the northwestern corner of the site. The separator effluent discharges to the Patapsco River. A second oil/water separator is located north of tank no. 15 on the former location of a Gulf Oil terminal. Its discharge flows into an on-site storm sewer that empties into the Patapsco River.[2,3]

To the east of the main terminal across South Clinton Street are two tanks (nos. 16 and 17). Each tank is encased in an outer steel shell. A six-inch-deep layer of bentonite covers the area between the tank wall and the outer shell. A pipe bridge runs above South Clinton Street from the main terminal to these tanks. A six-foot-high cyclone fence with a locking gate surrounds the tanks.[2,3]

Approximately 1/2 mile east of the main terminal are two tanks that were erected in the early 1980s. The tanks are surrounded by a six-inch-deep layer of bentonite. Access to the tanks is unrestricted. Fuel oil is pumped from the main terminal to the tanks via underground pipelines.[2,3]

Two barge unloading docks are located west of the main terminal and extend out into the Patapsco River.[2,3]

Access to the main terminal is restricted by a six-foot-high cyclone fence with a locking gate.[2,3]

2.3 Ownership History

Petroleum Fuel and Terminal Corporation, a subsidiary of APEX Oil Company, currently owns the site. Petroleum Fuel and Terminal Corporation bought the property from one of its subsidiaries, Petroleum Marketing Corporation, in April 1978. Petroleum Marketing Corporation purchased the property in 1973 from Crown Central Petroleum. Crown Central Petroleum leased the property to Petroleum Marketing from 1970 until 1973. The property was unused from 1968 until 1970. Crown Central Petroleum operated the site from 1947 until 1968.[2,4]

The site was owned by Gulf Oil Company before Crown Central. Ownership before Gulf Oil Company is not known.[2,4]

2.4 Site Use History

The site is currently used for the storage and shipment of unleaded gasoline and No. 2 and No. 6 fuel oil. The fuel oil and gasoline are shipped via oil tankers. The oil tankers are anchored at two available loading docks. The fuel is pumped to various storage tanks to await transport off site by truck oil tankers.[2]

The two on-site oil/water separators receive site surface runoff and any spills that occur around the storage tanks. In the separator, any solids are allowed to settle out, and the oil is skimmed off the surface. According to site representatives, the sludge from the separator and the skimmed oil are pumped back to the No. 6 fuel oil storage tank. Water from one separator is discharged to the Patapsco River under an NPDES permit. The other separator drains into a storm sewer that empties into the Patapsco River under the same NPDES permit. The storm sewer also receives drainage from South Clinton Street, which is located east of the site.[2,3,4]

Crown Central Petroleum used the site to dispose lead-contaminated sludge from the bottoms of the storage tanks. The sludge was spread on the ground and allowed to weather for several months. The sludge was then dumped into burial pits and covered with soil. The locations of the pits and the quantity of sludge disposed are not known.[4]

2.5 Permit and Regulatory Action History

A September 16, 1983 site visit by MD WMA personnel revealed no weathering areas or burial pits. MD WMA recommended that a low-priority site inspection be conducted at the facility.[4]

The Petroleum Fuel and Terminal Corporation facility operates under EPA ID No. MDD091805812 as a hazardous waste generator. According to the site representatives, only sludge from the oil/water separators (K015) and leaded tank bottoms (K052) wastes are handled on site.[2] No Notification of Hazardous Waste Activity or Part A Hazardous Waste Permit Application could be located in the MD WMA file search.

The two oil/water separators discharges are sampled once a month for suspended solids, oil, and grease. On February 28, 1990, samples collected from the oil/water separators were analyzed by SGS Control Services, Incorporated. Laboratory results revealed concentrations of suspended solids of 15.3 mg/l and 15.7 mg/l. The oil/water separators operate under NPDES Permit No. MD0057673.[2,5]

The facility also possesses Oil Operations Permit No. 89-OP-0808 to operate an oil facility and Air Operation Permit No. 24-1923-9-0261 for the truck loading rack.[2]

FIT 3 conducted a site inspection on April 10, 1990. Activities included collecting on-site soil samples and samples from the discharge of the two on-site oil/water separators. Results from the soil sampling revealed elevated levels of the common constituents of gasoline, including benzene (up to 3,700 ug/kg), toluene (up to 4,600 ug/kg), ethylbenzene (up to 10,000 ug/kg), and total xylenes (up to 340,000 ug/kg). In addition, notable levels of lead (up to 3,460 mg/kg), arsenic (759 mg/kg), PCBs (up to 120 ug/kg), polycyclic aromatic hydrocarbons (PAHs) (up to 27,000 ug/kg), and acetone (up to 40,000 ug/kg) were detected in on-site soil samples. Samples collected from the discharge of the two on-site oil/water separators revealed elevated levels of benzene (up to 2,700 ug/l), toluene (up to 4,600 ug/l), ethylbenzene (up to 1,500 ug/l), and total xylenes (up to 1,500 ug/l). Lead was also detected in aqueous samples (up to 420 ug/l) and in sediment samples (up to 778 ug/kg) collected from the two oil/water separators, as well as PCBs (1,500 ug/kg).[3]

2.6 Remedial Action to Date

No remedial action is known to have occurred at the subject site.[2]

SECTION 3

3.0 ENVIRONMENTAL SETTING

3.1 Water Supply

Surface water is the source of potable water for individuals in the four-mile-radius area around the Crown Central Petroleum site. All individuals not served by a water company are assumed to maintain private domestic wells. Based on available data, however, no water supply wells are located in the study area.[6,7,8]

CBWD serves an estimated total population of 1.6 million in the city of Baltimore and adjacent areas in Baltimore, Anne Arundel, and Howard Counties. The entire study area lies within the CBWD distribution area. CBWD obtains water from (b) (9) [redacted] CBWD also maintains a surface water intake on (b) (9) [redacted] The (b) (9) [redacted] intake is currently not in use and has only been used 4 or 5 times in the past 20 years. CBWD sells raw water to Caroll County.[6,7]

3.2 Surface Waters

Site surface water runoff flows to the storm drains. The storm drains enter the two oil/water separators. The separator located in the northern portion of the site discharges directly into the Patapsco River. The other separator empties into a storm sewer system. The storm sewer discharges into the Patapsco River. The storm sewer also receives runoff from off site. The Patapsco River flows to the southeast approximately 10 miles before it converges with the Chesapeake Bay.[1,2]

The Patapsco River and the Chesapeake Bay are used for recreation and fishing.[9]

The nearest wetlands exceeding five acres in size are located three miles west of the site.[10]

3.3 Hydrogeology

The geologic and hydrogeologic conditions in the study area were researched as part of the site inspection. A preliminary literature review was conducted to determine surface and subsurface geologic conditions, soil character, and the status of groundwater transport and storage.

3.3.1 Geology

The study area is situated in the Western Shore subdivision of the Atlantic Coastal Plain Physiographic Province and the Eastern Division of the Piedmont Physiographic Province. The Fall Line separates the Coastal Plain area from the Piedmont area and trends roughly southwest to northeast. The Atlantic Coastal Plain Physiographic Province extends from New England southwardly through eastern Florida. The eastern limit of the Coastal Plain is the edge of the continental shelf, which in Maryland is located about 100 miles offshore in 600 feet (100 fathoms) of water. The subareal portion of the Coastal Plain in Maryland has been subdivided into an Eastern Shore and a Western Shore, separated by the Chesapeake Bay. The site and approximately 95 percent of the study area lie in the rolling upland terrain of the Western Shore subdivision of the Coastal Plain. The Coastal Plain is underlain by a series of southeastward-dipping layers of relatively unconsolidated Cretaceous to Recent clay, silt, sand, and gravel. The unconsolidated sediments are superimposed upon the eastward continuation of the crystalline rocks of the Eastern Division of the Piedmont Physiographic Province in a series of wedge-shaped sheets. The sedimentary sheets dip to the east and southeast away from the Fall Line at a rate of 10 to 40 feet per mile and thicken downdip. Little is known about the crystalline rocks that underlie the 2,000 to 3,000 feet of Coastal Plain sediments.[8]

The Piedmont Physiographic Province in Maryland is approximately 40 miles wide at its southern end and broadens northwardly to a maximum of 65 miles. The eastern margin of the Piedmont Physiographic Province is the Fall Line; the western margin are the slopes of Catoctin Mountain. Numerous deep and narrow stream valleys are incised into the broad and undulating surface of the Piedmont. Parrs Ridge, trending south-southwest to northeast, forms the divide between streams flowing directly into Chesapeake Bay and streams flowing into the Potomac River and separates the Piedmont into an Eastern and Western Division. Approximately five percent of the study area lies in the Eastern Division of the Piedmont Physiographic Province. The Piedmont Physiographic Province is underlain by a complex series of igneous and metamorphic rocks. These rocks have been so intricately infolded and metamorphosed that their original geologic relationships and ages are a matter of conjecture.[8,11]

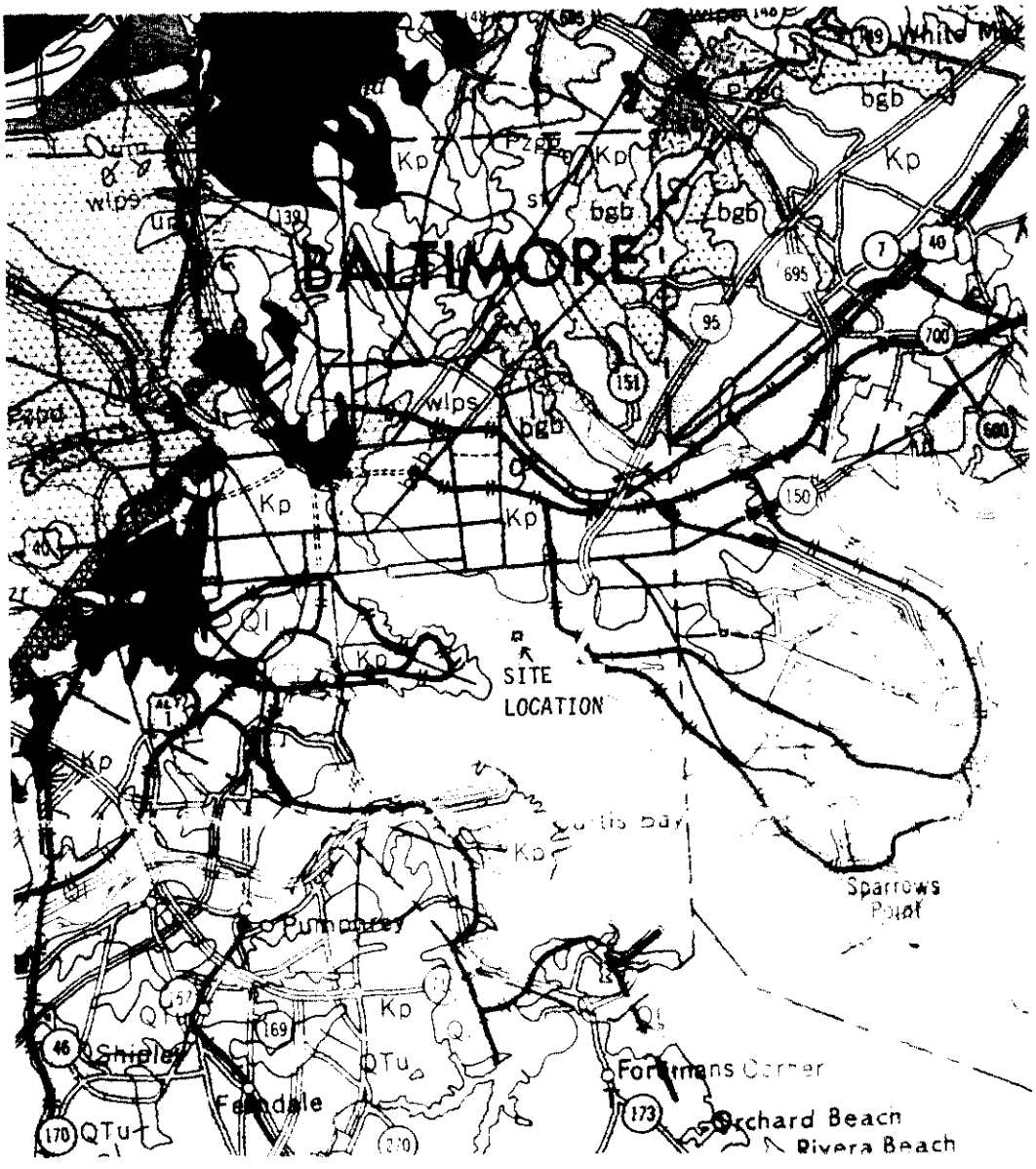
The site is located along the eastern edge of the Northwest Harbor. Topographic relief in the study area is about 200 feet, and topographic relief at the site is less than 10 feet. The site has an average elevation of about 10 feet above mean sea level. About 25 percent of the study area is underlain by unconsolidated Quaternary sediments, 40 percent by unconsolidated Cretaceous sediments, and 5 percent by Paleozoic to Precambrian crystalline rocks. About 30 percent of the study area is covered by water. The geologic map for the study area is shown on figure 3.1 (page 3-4).[1,12]

The site is underlain by Quaternary Lowland deposits. Pleistocene deposits in the Coastal Plain area of Maryland have been subdivided into Quaternary Lowland deposits and Quaternary Upland deposits. Quaternary Lowland deposits, in general, crop out adjacent to streams, rivers, and lakes and range in thickness from 0 to 150 feet. The Quaternary Lowland deposits consist of unconsolidated gravels and medium- to coarse-grained sands, silts, and clays. Estuarine to marine faunas are found in some areas.[12]

The Cretaceous Potomac Group, undivided, has been mapped 0.5 mile north of the site and may stratigraphically underlie the Quaternary Lowland deposits. The Potomac Group crops out in an arcuate band east of the Fall Line and, where not removed by erosion, ranges in stratigraphic thickness in the city of Baltimore area from 105 to 500 feet. The Potomac Group has been subdivided into, in descending order, the Patapsco Formation, the Arundel Clay, and the Patuxent Formation. The Patapsco Formation consists of gray, brown, and red variegated silt and clay. Lenticular, crossbedded, argillaceous sand and minor gravel are present. The Patapsco Formation crops out along the eastern margin of the arcuate outcrop belt and ranges in stratigraphic thickness from 30 to 246 feet in the city of Baltimore area. The Arundel Clay consists of dark gray and maroon lignitic clay and ranges in stratigraphic thickness in the city of Baltimore area from 25 to 100 feet. The Arundel Clay crops out west of the Patapsco Formation outcrops. The Patuxent Formation consists of white or light gray to orange-brown, crossbedded, argillaceous sand and quartz gravel, with minor amounts of pale gray silt and clay. The Patuxent Formation has a stratigraphic thickness of about 150 feet in the city of Baltimore area and crops out along the western margin of the arcuate outcrop belt.[12]

Undifferentiated Mesozoic rocks stratigraphically underlie the Potomac Group. Mesozoic rock types include coarse-grained conglomerate and fine- to coarse-grained sandstone, siltstone, and shale. The conglomerates contain quartzite, vein quartz, pegmatite, and serpentine pebbles. The sandstones are reddish brown, gray, and green in color and are mottled. Undifferentiated Paleozoic to Precambrian crystalline rocks stratigraphically underlie the Undifferentiated Mesozoic rocks. Crystalline rock types include weathered schist and mica gneiss.[12]

Ql	Lowland Deposits	um	Ultramafic Rocks
QTu	Upland Deposits (Western Shore)	bgb	Baltimore Gabbro Complex
Kp	Potomac Group	wlps	Lower Pelitic Schist, Wissahickon Formation
Pzpd	Port Deposit Gneiss	sf	Setters Formation
Pzgg	Gunpowder Granite	p€bg	Baltimore Gneiss



5 0 5 10 Statute Miles

Source: Geologic Map of Maryland. Maryland State Geological Survey. 1968.

FIGURE 3.1

GEOLOGIC MAP
CROWN CENTRAL PETROLEUM SITE
Baltimore County, Maryland

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The small portion of the study area that falls west of the Fall Line is underlain by intricately folded and metamorphosed Paleozoic and Precambrian rocks. The original geologic relationships of these rocks are unknown.[12]

About five percent of the study area is underlain by the early Paleozoic to late Precambrian Baltimore Gabbro Complex. The Baltimore Gabbro Complex has been mapped 2.25 miles northwest of the site. The Baltimore Gabbro Complex consists primarily of hypersthene gabbro with subordinate amounts of olivine gabbro, norite, anorthositic gabbro, and pyroxenite.[12]

3.3.2 Soils

The soils underlying the city of Baltimore have not been mapped and are assumed to consist of disturbed soil, fill, and Made land. No permeability, available moisture capacity, or soil reaction data are available for soils found in the city of Baltimore. The site is reported to be situated on created land composed of artificial fill material. An open area in the northwestern corner of the site was found to consist of ore and slag fill from copper and steel works that were in operation in the late 1800s.[4,13]

Eight subsurface soil samples were taken by NUS FIT 3 personnel during the April 10, 1990 site visit (see figure 5.1, page 5-4). The subsurface soil samples consisted of very dark sandy soil and brown to black clayey soil. Minor amounts of pebbles were noted in the sandy soil samples.[3]

3.3.3 Groundwater

The source of groundwater in Baltimore County is precipitation. Of the average 42.5 inches of precipitation that fall each year in Baltimore County, about 25.5 inches are lost to evapotranspiration. An additional 5.5 inches are lost to surface runoff, leaving 11.5 inches available to infiltrate downward and recharge groundwater. The land surface serves as a recharge area, and discharge points include wells, springs, streams, and lakes. Palustrine, riverine, and estuarine non-open water wetlands have been mapped in the study area. Palustrine wetlands identified include forested, scrub/shrub, and emergent. Riverine wetlands identified include lower perennial river bottom. Estuarine wetlands identified include intertidal beach/bar and intertidal forested. The nearest wetlands of five acres or greater in area are located 2.75 miles west of the site and include estuarine intertidal forested. The wetlands are hydraulically connected with the shallow aquifers and serve as additional discharge points.[8,10]

The site and approximately 95 percent of the study area are underlain by unconsolidated Cretaceous and Quaternary sediments of the Atlantic Coastal Plain. Much of the groundwater in the Coastal Plain is stored in the intergranular porosity of the unconsolidated sediments. In general, groundwater exists under water-table conditions in Pleistocene to Holocene sediments and under confined conditions in Tertiary and older deposits. Extensive salt-water contamination resulting from heavy pumping and dredging of the Patapsco River is present in aquifers in the city of Baltimore industrial area. The aquifers present beneath the site have probably been subject to salt-water contamination.[8,14]

Quaternary Lowland deposits have been mapped at the site. The Quaternary Lowland deposits, because of their limited lateral extent, in general, do not contain water-bearing aquifers in Baltimore County. Large quantities of water may be yielded, however, where the water-bearing deposits are 50 to 100 feet thick.[14,15]

The Cretaceous Potomac Group has been subdivided into, in descending order, the Patapsco Formation, the Arundel Clay, and the Patuxent Formation. In the city of Baltimore industrial area, yields of 300 to 500 gallons per minute (gpm) have been reported from wells producing from aquifers developed in the Patapsco Formation. North of Highway 40, some dug wells have yielded potable water from the Patapsco Formation aquifers in sufficient quantities for domestic use. The Arundel Clay is generally considered to act as an aquitard or an aquiclude, although some dug wells have yielded sufficient quantities of potable water for domestic use. The Patuxent Formation forms the major aquifer in the Baltimore industrial area. South of Highway 40, the Patuxent Formation yields sufficient quantities of potable water for domestic and small commercial use. North of Highway 40, the Patuxent Formation has yielded potable water to dug wells and to wells drilled in thicker erosional outliers.[14,15]

About five percent of the study area is underlain by Paleozoic and Precambrian crystalline rocks of the Piedmont Physiographic Province. Much of the groundwater in the Piedmont is stored in the weathered zone in the intergranular porosity of the saprolite. A saprolite is a stage in the breakdown of the bedrock due to weathering processes. Based on 34 samples of saprolite taken from the Piedmont area of Maryland, the average porosity is 47 percent and the maximum porosity is 60 percent. The saprolite found on the Maryland Piedmont has an average thickness of 45 feet. Groundwater is also stored in secondary openings developed in the unweathered crystalline metamorphic and igneous rocks. Secondary openings include fractures, joints, crevices, and faults. Primary porosity in these unweathered crystalline rocks is generally less than one percent.[11,15]

The water-bearing properties of the crystalline rocks of the Piedmont have been loosely grouped based on rock types. The four main rock types are acidic to intermediate intrusive rock, quartzite, gneiss, and gabbro and diabase. Only one of the rock types, the gabbro and diabase, has been mapped in the study area. For aquifers developed in gabbroic and diabasic rocks, such as the Baltimore Gabbro Complex, reported yields range from 0.5 to 80 gpm and average 10 gpm. Well depths range from 29 to 450 feet and average 92 feet. Most of the wells producing from aquifers developed in the Baltimore Gabbro Complex obtain water at or near the contact of the weathered overburden and the unweathered gabbro. A few wells appear to obtain water from fractures developed within the unweathered gabbro. Characteristically, these wells have comparatively high initial yields that decrease rapidly as the fracture storage is depleted.[11,15]

No information is available in-house on water wells in the study area. Since 1973, 14 oil recovery wells have been installed on Exxon property located just north of the site. Seven of the 14 oil recovery wells are currently in service. No further information is available on the Exxon wells.[4,8,14]

Based on topography, the groundwater flow direction beneath the site is to the west, toward Northwest Harbor. The depth to groundwater beneath the site is estimated to range from 0 to 10 feet because the site is located adjacent to Northwest Harbor, and the site elevation ranges from 0 to about 10 feet above mean sea level.[1]

3.4 Climate and Meteorology

The climate in the region is influenced by the Chesapeake Bay and Atlantic Ocean to the east and the Appalachian Mountains to the west. The average temperature in the summer is 73.4°F, and the average temperature in the winter is 36.8°F. The annual precipitation of the area is 41.87 inches. The mean annual lake evaporation is 36 inches, which yields a net precipitation of 5.87 inches. The 1-year, 24-hour rainfall is 2.6 inches.[16,17]

3.5 Land Use

The subject site is located within the city limits of Baltimore, Maryland. Land use in the immediate vicinity is industrial and commercial. The closest residences are located approximately 0.5 mile north of the site.[1,2]

An abandoned Exxon Oil terminal is located to the north, and to the south is the former location of a Gulf Oil terminal. The Patapsco River borders the site to the west. Located east of the site are abandoned warehouses and commercial businesses.[1,4]

3.6 Population Distribution

There are approximately 39,339 people residing within 1 mile of the site. The population living from 1 to 2 miles from the site is approximately 118,213, and approximately 158,643 people reside between 2 and 3 miles from the site. The total population of the study area is approximately 316,195. Areas of dense population were estimated using the Rand McNally Commercial Reference Map and Guide. Other areas were estimated using the house-count method (the number of houses multiplied by 3.8 persons per house).[18]

3.7 Critical Environments

Peregrine falcon (*Falco peregrinus*) nesting territories exist approximately three miles northwest of the site.[19]

The nearest wetlands exceeding five acres in size are located three miles west of the site.[10]

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SECTION 4

4.0 WASTE TYPES AND QUANTITIES

Crown Central Petroleum used the site to dispose lead-contaminated sludge that was removed from the bottom of the fuel storage tanks. The sludge was spread on the ground and allowed to weather for several months. The sludge was then dumped into burial pits and covered with soil. The locations of the pits and the types and quantities of the sludge disposed are not known.[4]

An area at the northwestern corner of the property once contained ores and slags from a copper and steel works that was in operation in the late 1800s. The quantities of ores and slags disposed are not known.[4]

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SECTION 5

5.0 FIELD TRIP REPORT

5.1 Summary

On Tuesday, April 10, 1990, FIT 3 members Richard Costello, Michael Heffron, Richard Heath, Michael McCarthy, John King, and Linda LaSut conducted a site inspection of the Crown Central Petroleum site in Baltimore, Maryland. Permission for site access was granted by Robert Welch, general manager of APEX Oil Company. Weather conditions at the time of the site inspection were sunny and mild, with temperatures in the mid-50s.

Four aqueous and 13 solid samples were obtained, including duplicates, blanks, and a background sample (see figures 5.1 and 5.2, pages 5-4 and 5-5). Photographs were taken during the site reconnaissance (see figure 5.3, page 5-7, and the photograph log, section 5.5). Permission to photograph the sample locations was denied by the site owner.

5.2 Persons Contacted

5.2.1 Prior to Field Trip

Gregory Ham
U.S. EPA
841 Chestnut Building
Ninth and Chestnut Streets
Philadelphia, PA 19107
(215) 597-8229

Robert Welch
APEX Oil Company
8182 Maryland Avenue
St. Louis, MO 63105
(314) 889-9600

Edward Carlson
Maryland Department of the Environment
Waste Management Division
2500 Broening Highway
Baltimore, MD 21224
(301) 631-3472

Jack Weinhold
Petroleum Fuel and Terminal Company
1622 South Clinton Street
Baltimore, MD 21224
(301) 342-7800

5.2.2 At the Site

Jack Weinhold
Petroleum Fuel and Terminal Company
1622 South Clinton Street
Baltimore, MD 21224
(301) 342-7800

5.2.3 Water Supply Well Information

There are no known home wells within the study area. No home well surveys were distributed.

TDD NUMBER 9003-08

EPA NUMBER MD-113

5.3 SAMPLE LOG

SITE NAME [illegible]

TRAFFIC REPORTS			SAMPLE IDENTIFIER	PHASE	SAMPLE DESCRIPTION	SAMPLE LOCATION	TARGET USE	pH	FIELD MEASUREMENTS
Organic	Inorganic	High Hazard							
CDR89	MCCD09		SUB-5	SOL	BLACK/BROWN SANDY MOIST NO ODOR	17'8" SOUTH OF GATE VALVE TO TANK #1	ACCESS RESTRICTED		NO OVA READING ABOVE BACKGROUND
CDR90	MCCD10		SUB-6	SOL	SANDY, LARGE PEBBLES	11'6" NE OF ACCESS DOOR TO TANK #1	ACCESS RESTRICTED		
CDR91	MCCD11		SUB-7	SOL	DARK BROWN MOIST, SILTY WITH ORGANIC MATTER	6' EAST OF DIKE WALL	ACCESS RESTRICTED		
CDR92	MCCD12		SUB-8	SOL	VERY DARK BROWN, MOIST SANDY SILT	10'4" SOUTH OF TANK #10	ACCESS RESTRICTED		
CDR93	MCCD13		SUB-9	SOL	LIGHT TO DARK BROWN PEBBLES	87' SOUTH OF SLAG DIKE	ACCESS RESTRICTED		
CDR94	MCCD14		SD-1	SOL	BLACK, SANDY CLAY SMALL PEBBLES OIL-LIKE ODOR	OVERFLOW TRENCH DOWNSTREAM OF OIL/WATER SEPARATOR	NO USES		
CDR95	MCCD15		S-BACK	SOL	SANDY, SILTY PEBBLES WITH SOME ORGANIC MATTER	170' NORTH OF ABANDONED WAREHOUSE	OPEN ACCESS		
CDR96			TRIP BLANK	AQ	AQUEOUS BLANK FOR SOLID ANALYSIS	BLANK	BLANK		
CDR98	MCCD17		SD-10	SOL	DUPLICATE OF SD-1	SAME AS SD-1	SAME AS SD-1		

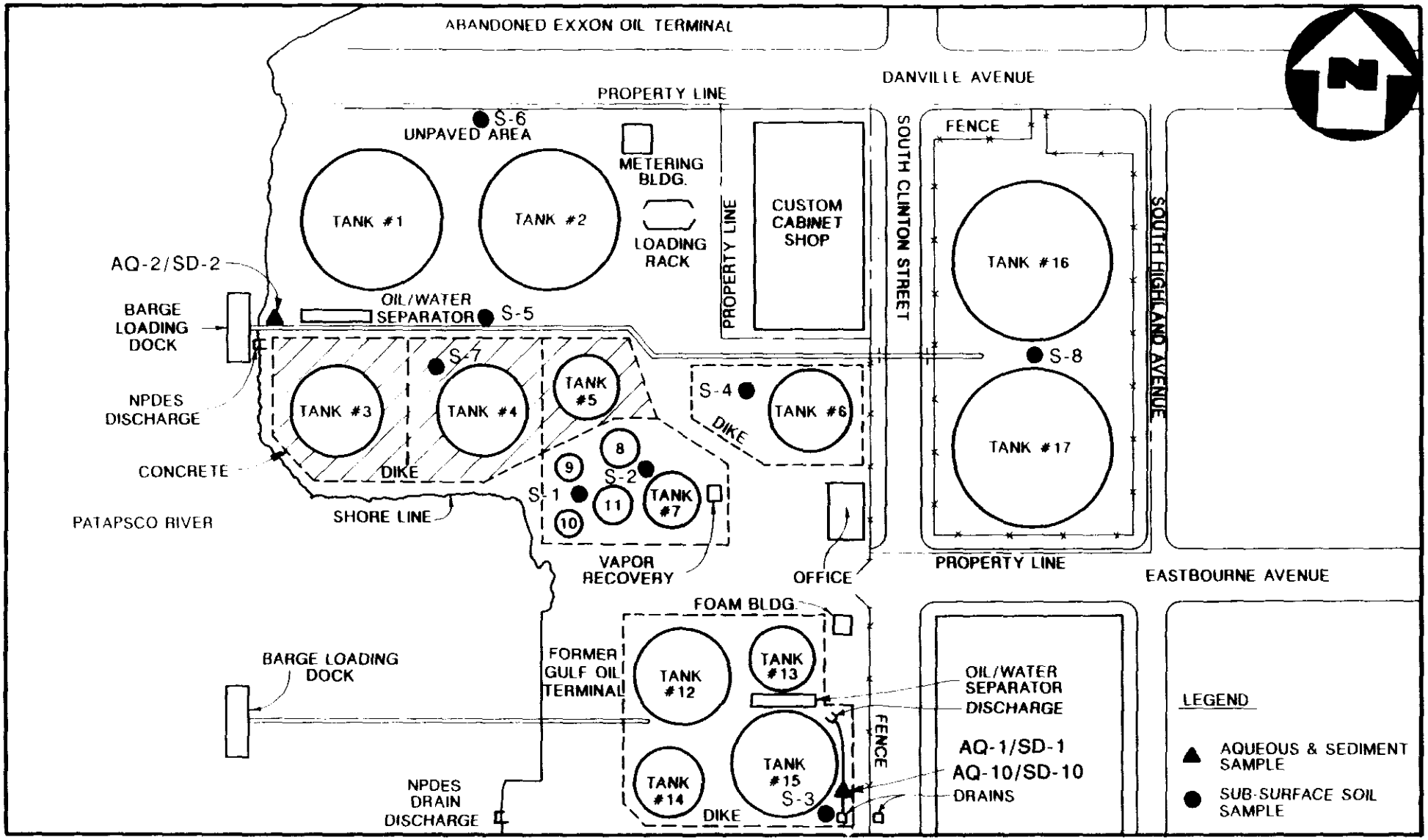
TDD NUMBER 9003-08

EPA NUMBER MD-113

5.3 SAMPLE LOG

SITE NAME [illegible]

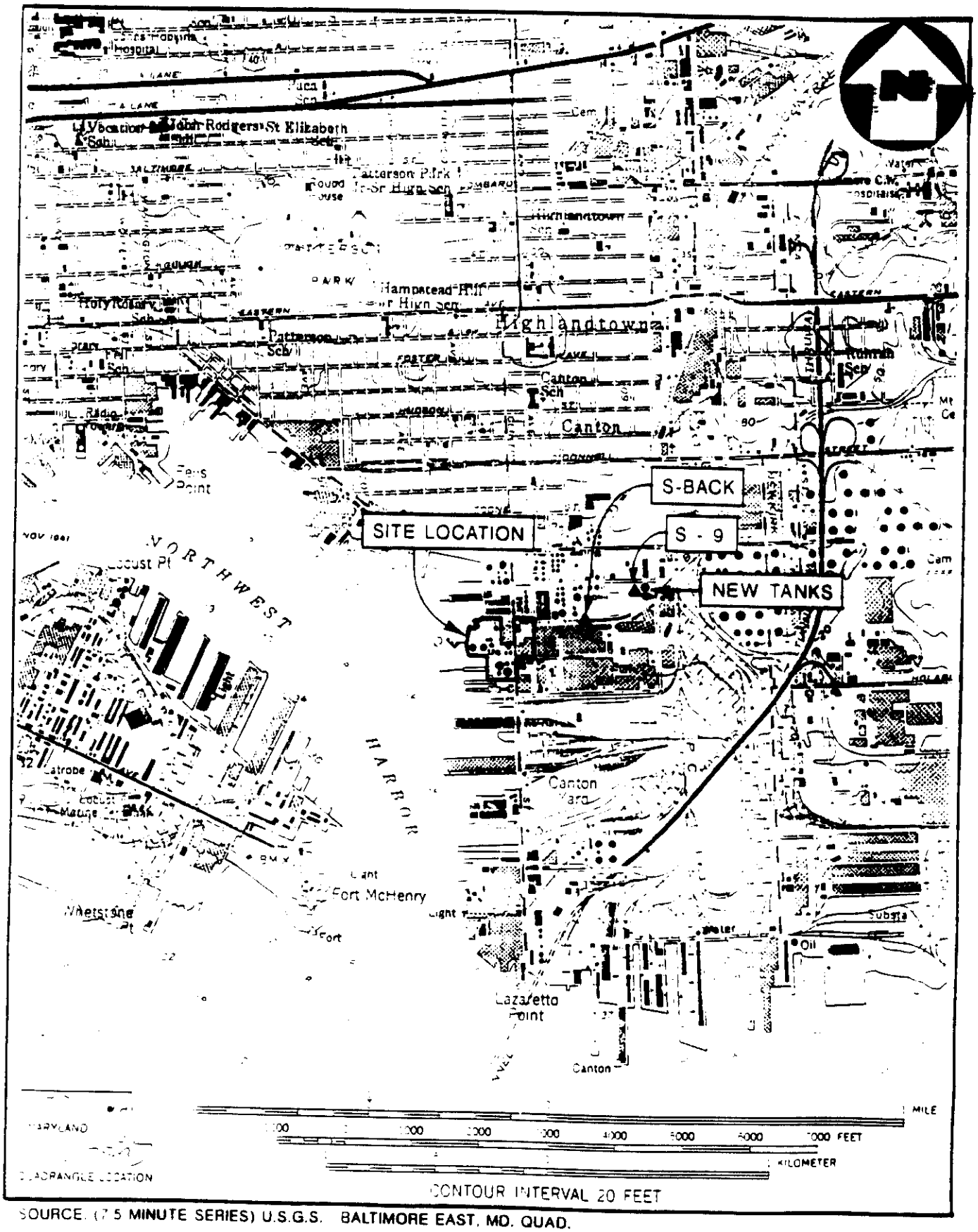
TRAFFIC REPORTS			SAMPLE IDENTIFIER	PHASE	SAMPLE DESCRIPTION	SAMPLE LOCATION	TARGET USE	pH	FIELD MEASUREMENTS
Organic	Inorganic	High Hazard							
DR80	MCCD00		AQ-1	AQ	CLEAR, NO ODOR STANDING WATER	OIL/WATER SEPARATOR DISCHARGE, DOWNGRADIENT OF TANK #15	NO USES	6.5	NO OVA READINGS ABOVE BACKGROUND
DR81	MCCD01		AQ-2	AQ	CLOUDY STANDING WATER NO ODOR	OIL/WATER SEPARATOR STAND PIPE, DOWNGRADIENT OF TANK #1	NO USES	4.1	
DR82	MCCD02		AQ-10	AQ	DUPLICATE OF AQ-1		NO USES		
DR83	MCCD03		AQ BLANK	AQ	AQUEOUS BLANK	BLANK	BLANK		
DR84	MCCD04		SUB-1	SOL	VERY DARK, MOIST SANDY SOIL. DIESEL-LIKE ODOR	APPROX. 20 FEET NW OF TANK #11	ACCESS RESTRICTED		
DR85	MCCD05		SUB-2	SOL	BROWN/BLACK, MOIST STAINED SOIL. SMALL PEBBLES. GASOLINE-LIKE ODOR.	5'6" SOUTH OF METER BOX	ACCESS RESTRICTED		
DR86	MCCD06		SUB-10	SOL	DUPLICATE OF SUB-1		ACCESS RESTRICTED		
DR87	MCCD07		SUB-3	SOL	SANDY, SMALL PEBBLES, MOIST DARK OILY STAINS OIL-LIKE ODOR	14'8" WEST OF DIKE WALL	ACCESS RESTRICTED		
DR88	MCCD08		SUB-4	SOL	DARK BROWN MOIST, CLAY-LIKE NO ODOR	29' EAST OF DIKE WALL	ACCESS RESTRICTED		



SAMPLE LOCATION MAP
CROWN CENTRAL PETROLEUM
(NO SCALE)

FIGURE 5.1

NUS CORPORATION



SOURCE: (7.5 MINUTE SERIES) U.S.G.S. BALTIMORE EAST, MD. QUAD.

OFF-SITE SAMPLE LOCATIONS

CROWN CENTRAL PETROLEUM

SCALE 1: 24000

FIGURE 5.2

NUS CORPORATION

5.4 Site Observations

- The OVA background reading was 0 ppm. No readings above background were recorded.
- The radiation mini-alert was set on the X1 position. No readings above background were recorded.
- Access to the site was from South Clinton Street and through a locking gate.
- A six-foot-high chain-link fence surrounded the main tank terminal to the north, south, and east.
- Surface drainage is from east to west and into the Patapsco River.
- A total of 16 fuel storage tanks of various capacities occupied a major portion of the site.
- Four storage tanks were located east of the main terminal. Two of the four tanks were surrounded by a six-foot-high chain-link fence with a locking gate.
- The NPDES discharge was observed below the water surface. An oily sheen was observed outside the discharge area.
- A two-story building at the southwestern corner of Clinton and Danville Streets housed a custom kitchen cabinet shop.
- Bentonite was used under some of the storage tanks. The remaining oil storage tanks sat on concrete.
- The spraying of herbicides near designated sample locations was observed.
- No stained soils or stressed vegetation were observed.
- Earthen dikes and concrete diking walls served as containment for the storage tanks.

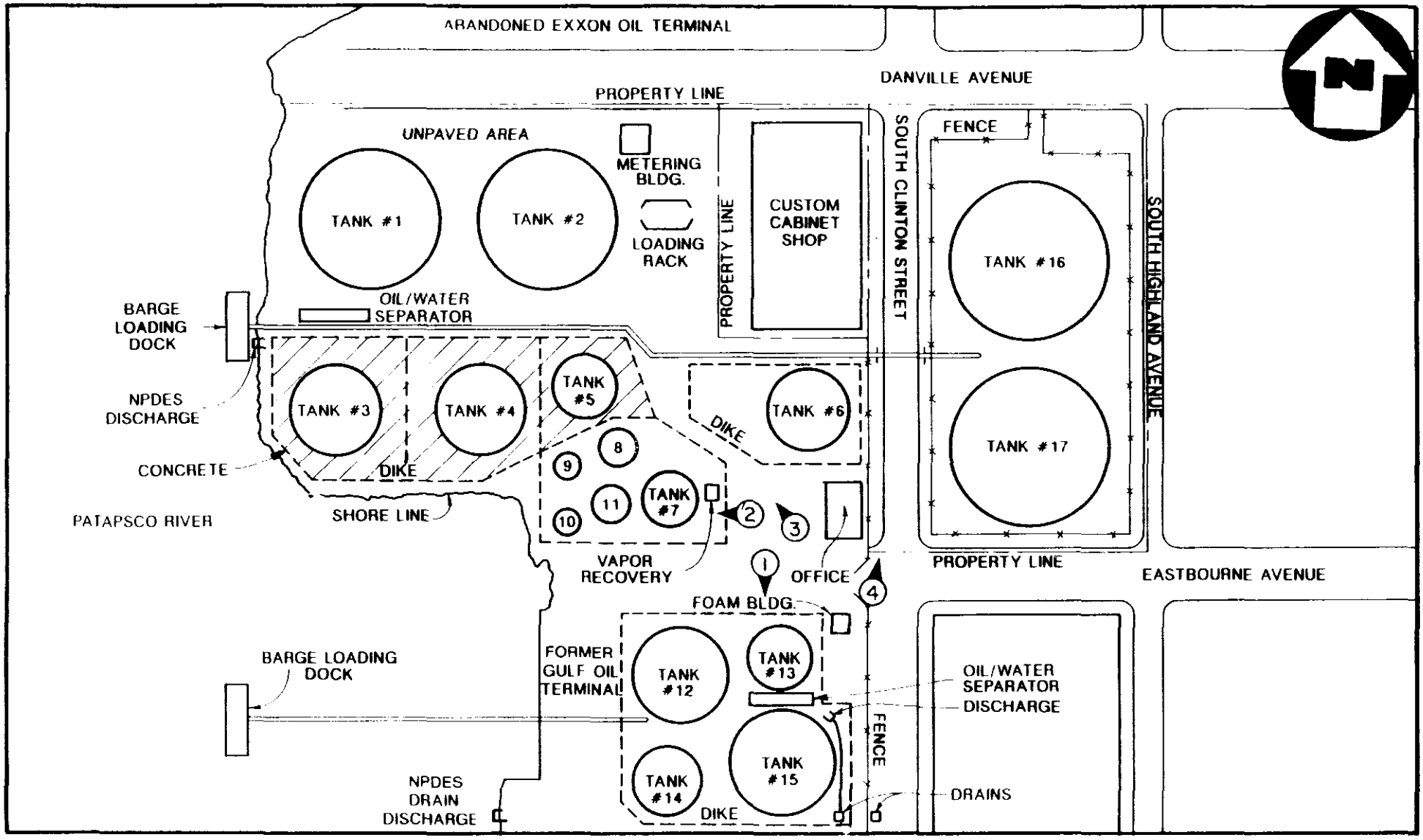


PHOTO LOCATION MAP
CROWN CENTRAL PETROLEUM
(NO SCALE)

FIGURE 5.3

NUS CORPORATION

EPA REGION III
SUPERFUND DOCUMENT MANAGEMENT SYSTEM

DOC ID # 427872
PAGE # _____

IMAGERY COVER SHEET
UNSCANNABLE ITEM

Contact the CERCLA Records Center to view this document.

SITE NAME Crown Central Petroleum Co

OPERABLE UNIT 00

SECTION/BOX/FOLDER 1C Box 1 1.001

REPORT OR DOCUMENT TITLE Site Inspection Report

DATE OF DOCUMENT 12/27/90

DESCRIPTION OF IMAGERY photographic log

NUMBER AND TYPE OF IMAGERY ITEM(S) 2 pages of photos

F3-9003-08

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Crown Central Petroleum	1622 South Clinton Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG. DIST
Baltimore	MD	21224	Baltimore	005	MD03

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
39° 16' 24". N	76° 35' 4.5"W	[X] A. PRIVATE [ ] B. FEDERAL [ ] C. STATE [ ] D. COUNTY [ ] E. MUNICIPAL [ ] F. OTHER [ ] G. UNKNOWN

II. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
04 / 10 / 90 (month day year)	[X] A. ACTIVE [ ] B. INACTIVE	1947 / Present (BEGINNING YEAR / ENDING YEAR) ____ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

[ ] A. EPA [X] B. EPA CONTRACTOR NUS Corporation (Name of firm) [ ] C. MUNICIPAL [ ] D. MUNICIPAL CONTRACTOR ____ (Name of firm)

[ ] E. STATE [ ] F. STATE CONTRACTOR ____ (Name of firm) [ ] G. OTHER ____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Richard Costello	Environmental Engineer	NUS Corporation	(215) 687-9510
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Michael Heffron	Geologist	NUS Corporation	(215) 687-9510
Richard Heath	Geologist	NUS Corporation	(215) 687-9510
Michael McCarthy	Environmental Specialist	NUS Corporation	(215) 687-9510
John King	Environmental Scientist	NUS Corporation	(215) 687-9510
Linda LaSut	Environmental Technician	NUS Corporation	(215) 687-9510

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Jack Weinhold	Terminal Manager	Petroleum Fuel & Terminal Company 1622 South Clinton Street Baltimore, MD	(301) 342-7800
			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
[X] PERMISSION [ ] WARRANT	9:00 A.M.	Weather conditions were mild and sunny, with temperatures in the mid-50s.

III. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Gregory Ham	U.S. EPA	(215) 597-8229

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO	08 DATE
Richard Costello	NUS	FIT 3	(215) 687-9510	05 / 25 / 90 (month day year)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

ORIGINAL (Red)

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES *(Check all that apply)*

- [ ] A. SOLID
- [ ] B. POWDER, FINES
- [x] C. SLUDGE
- [ ] D. OTHER _____ *(Specify)*
- [ ] E. SLURRY
- [ ] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE *(Measures of waste quantities must be independent)*

TONS _____
CUBIC YARDS unknown
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS *(Check all that apply)*

- [x] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [x] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	unknown		Leaded tank bottoms were disposed
OLW	OILY WASTES	unknown		at the site.
SOL	SOLVENTS			
PSD	PESTICIDES	unknown		
OCC	OTHER ORGANIC CHEMICALS	unknown		
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	unknown		

IV. HAZARDOUS SUBSTANCES *(See Appendix for most frequently cited CAS Numbers)*

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	benzene	71-43-2	on-site soil samples	3,700	ug/kg
OCC	toluene	108-88-3	on-site soil samples	2,300	ug/kg
OCC	ethylbenzene	100-41-4	on-site soil samples	10,000	ug/kg
OCC	total xylenes	100-42-5	on-site soil samples	340,000	ug/kg
MES	lead	7439-92-1	on-site soil samples	3,460	mg/kg
PSD	Aroclor 1254	11097-69-1	on-site soil samples	120	ug/kg
MES	arsenic	7440-38-2	on-site soil samples	759	mg/kg
OCC	pyrene	129-00-0	on-site soil samples	23,000	ug/kg
OCC	chrysene	218-01-9	on-site soil samples	14,000	ug/kg
OLW	benzene	71-43-2	on-site oil/water separator	2,700	ug/l
OLW	toluene	108-88-3	on-site oil/water separator	4,600	ug/l
OLW	total xylenes	100-42-5	on-site oil/water separator	1,500	ug/l
OLW	Aroclor 1254	11097-69-1	on-site oil/water separator	1,500	ug/kg
OLW	lead	7439-92-1	on-site oil/water separator	420	ug/l

IV. FEEDSTOCKS *(See Appendix for CAS Numbers)* N/A

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NUS FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 10, 1990.
Maryland State file information.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

ORIGINAL (Red)

I. IDENTIFICATION

01 STATE: MD | 02 SITE NUMBER: 113

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [ ] A. GROUNDWATER CONTAMINATION — 02 [ ] OBSERVED (DATE: ____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ____ 04 NARRATIVE DESCRIPTION

None reported or observed.

01 [X] B. SURFACE WATER CONTAMINATION — 02 [X] OBSERVED (DATE: 04/10/90) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown 04 NARRATIVE DESCRIPTION

Samples collected from the discharge of the two on-site oil/water separators revealed elevated levels of lead, PCBs, and the common constituents of gasoline.

01 [ ] C. CONTAMINATION OF AIR — 02 [ ] OBSERVED (DATE: ____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ____ 04 NARRATIVE DESCRIPTION

None reported or observed.

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS — 02 [ ] OBSERVED (DATE: ____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ____ 04 NARRATIVE DESCRIPTION

None reported or observed.

01 [ ] E. DIRECT CONTACT — 02 [ ] OBSERVED (DATE: ____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ____ 04 NARRATIVE DESCRIPTION

None reported or observed.

01 [X] F. CONTAMINATION OF SOIL — 02 [X] OBSERVED (DATE: 04/10/90) [ ] POTENTIAL [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: 8 (Acres) 04 NARRATIVE DESCRIPTION

Elevated levels of heavy metals, PAHs, and PCBs were detected in on-site soil samples.

01 [ ] G. DRINKING WATER CONTAMINATION — 02 [ ] OBSERVED (DATE: ____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ____ 04 NARRATIVE DESCRIPTION

None reported or observed.

01 [ ] H. WORKER EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: ____) [ ] POTENTIAL [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ____ 04 NARRATIVE DESCRIPTION

None reported or observed.

01 [ ] I. POPULATION EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: ____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ____ 04 NARRATIVE DESCRIPTION

None reported or observed.

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION

None reported or observed.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION (Include name(s) of species)

None reported or observed.

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION

None reported or observed.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES *(Spills, Runoff, Standing liquids, Leaking drums)* — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☒ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: 39,339/1 mile — 04 NARRATIVE DESCRIPTION

Leaded sludge bottoms were deposited throughout the site by the spreading and burial method.

01 ☐ N DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION

None reported or observed.

01 ☐ O CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION

Surface runoff from the site enters the storm sewer system.

01 ☐ P ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☒ ALLEGED

04 NARRATIVE DESCRIPTION

The disposal of lead-contaminated sludge from fuel storage tanks occurred at the site.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

N/A

III. TOTAL POPULATION POTENTIALLY AFFECTED: 158,643

IV. COMMENTS

N/A

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NUS FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 2, 1990.
Maryland State file information.

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
[X] A. NPDES	MD0057673	6/1/86	6/1/91	oil/water separator
[ ] B. UIC				
[X] C. AIR	24-1923-9-0261	6/1/89	5/31/90	truck loading rack
[ ] D. RCRA				
[ ] E. RCRA INTERIM STATUS				
[ ] F. SPCC PLAN				
[ ] G. STATE (specify)				
[ ] H. LOCAL (specify)				
[X] I. OTHER (specify)	89-OP-0808	1/20/89	1/20/90	oil operations permit
[ ] J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
[ ] A. SURFACE IMPOUNDMENT		
[ ] B. PILES		
[ ] C. DRUMS, ABOVE GROUND		
[ ] D. TANK, ABOVE GROUND		
[ ] E. TANK, BELOW GROUND		
[ ] F. LANDFILL		
[X] G. LANDFARM	unknown	
[ ] H. OPEN DUMP		
[ ] I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- [ ] A. INCINERATION
- [ ] B. UNDERGROUND INJECTION
- [ ] C. CHEMICAL/PHYSICAL
- [ ] D. BIOLOGICAL
- [ ] E. WASTE OIL PROCESSING
- [ ] F. SOLVENT RECOVERY
- [ ] G. OTHER RECYCLING/RECOVERY
- [ ] H. OTHER (Specify)

05 OTHER

- [X] A. BUILDINGS ON SITE

1 on-site office

06 AREA OF SITE

8 (Acres)

07 COMMENTS

It is suspected that the disposal of lead-contaminated sludge from tank bottoms occurred at the site from 1947 until 1968.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

[ ] A. ADEQUATE, SECURE [ ] B. MODERATE [X] C. INADEQUATE, POOR [ ] D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Concrete diking walls and earthen dikes surround the majority of the fuel storage tanks.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE [ ] YES [X] NO

02 COMMENTS

The site is surrounded on three sides by a six-feet-high chain-link fence with a locking gate. The Patapsco River borders the site to the west.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NUS FIT 3. Site inspection; site visit. TDD No. f3-9003-08, April 2, 1990.
Maryland State file information.

ORIGINAL (Red)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. [X]	B. [ ]
NON-COMMUNITY	C. [ ]	D. [ ]

02 STATUS

	ENDANGERED	AFFECTED	MONITORED
COMMUNITY	A. [ ]	B. [ ]	C. [X]
NON-COMMUNITY	D. [ ]	E. [ ]	F. [ ]

03 DISTANCE TO SITE
A. 17 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

[ ] A. ONLY SOURCE FOR DRINKING
[ ] B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available)
[ ] C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available)
[X] D. NOT USED, UNUSABLE

02 POPULATION SERVED BY GROUND WATER: N/A

03 DISTANCE TO NEAREST DRINKING WATER WELL: unknown (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
1 to 10 (ft)	west	< 30 (ft)	432,000 (gpd)	[ ] YES [X] NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

Fourteen wells (oil recovery) were located north of the site at the abandoned Exxon Oil Terminal.

10 RECHARGE AREA
[X] YES
[ ] NO
COMMENTS: Unpaved areas serve as recharge areas.

11 DISCHARGE AREA
[X] YES
[ ] NO
COMMENTS: Northwest of Chesapeake Bay

IV. SURFACE WATER

01 SURFACE WATER USE IN VICINITY (Check one)

[X] A. RESERVOIR, RECREATION DRINKING WATER SOURCE
[ ] B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES
[ ] C. COMMERCIAL, INDUSTRIAL
[ ] D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME	AFFECTED	DISTANCE TO SITE
Patapsco River	[ ]	adjacent (mi)
Colgate Creek	[ ]	1.75 (mi)
	[ ]	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 39,339 NO. OF PERSONS	B. 118,213 NO. OF PERSONS	C. 158,643 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: 0.2 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: 31,108

04 DISTANCE TO NEAREST OFF-SITE BUILDING: 100 feet (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The area surrounding the site is a commercial/industrial area. The closest residences are located 0.5 mile north of the site.

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE *(Check one)*

10^{-3} to 10^{-5} cm/sec

☐ A. 10^{-6} – 10^{-8} cm/sec ☐ B. 10^{-4} – 10^{-6} cm/sec ☒ C. 10^{-4} – 10^{-3} cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK *(Check one)*

10^{-3} to 10^{-5} cm/sec

☐ A. IMPERMEABLE *(Less than 10^{-6} cm/sec)* ☐ B. RELATIVELY IMPERMEABLE *(10^{-4} – 10^{-6} cm/sec)* ☒ C. RELATIVELY PERMEABLE *(10^{-2} – 10^{-4} cm/sec)* ☐ D. VERY PERMEABLE *(greater than 10^{-2} cm/sec)*

03 DEPTH TO BEDROCK	04 DIRECTION OF CONTAMINATED SOIL ZONE	05 SOIL pH
unknown (ft)	unknown (ft)	unknown

06 NET PRECIPITATION	07 ONE-YEAR 24-HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
5.87 (in)	2.6 (in)	< 2 %	west	1 to 2 %

09 FLOOD POTENTIAL

SITE IS IN 100 YEAR FLOOD PLAIN

10 N/A ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS *(5-acre minimum)*

ESTUARINE	OTHER
A. 3 (mi)	B. N/A (mi)

12 DISTANCE TO CRITICAL HABITAT *(of endangered species)*

3 (mi)

ENDANGERED SPECIES: peregrine falcon

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. < .5 (mi)	B. 0.5 (mi)	C. N/A (mi)	D. N/A (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site and the entire study area are relatively flat, with slopes averaging less than 5 percent.

VII. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NUS FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 2, 1990.
Maryland State file information.
U.S.G.S. Topographic Maps.

ORIGINAL

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER	3	Organic samples were sent to IT Cerritos	5/30/90
WASTE		Inorganic samples were sent to Columbia	
AIR			
RUNOFF			
SPILL			
SOIL	13		5/30/90
VEGETATION			
OTHER	2	1 aqueous blank and 1 trip blank	5/30/90

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
OVA	Background readings were 0.0 ppm; there were no readings above background.
Mini-alert	The unit was set on the X1 scale; there were no readings above background.

IV. PHOTOGRAPHS AND MAPS

01 TYPE [X] GROUND [ ] AERIAL

02 IN CUSTODY OF NUS Corporation files
(Name of organization or individual)

03 MAPS [X] YES [ ] NO

04 LOCATION OF MAPS NUS FIT 3 office

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

N/A

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NUS FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 10, 1990.

ORIGINAL

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. CURRENT OWNER(S)

01 NAME	02 D & B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Petroleum Fuel and Terminal Corporation		1622 South Clinton Street		Baltimore	MD	21224
N/A						
N/A						
N/A						

PARENT COMPANY *(if applicable)*

10 NAME	11 D & B NUMBER	12 STREET ADDRESS (P.O. Box, RFD #, Etc.)	13 SIC CODE	14 CITY	15 STATE	16 ZIP CODE
Apex Oil Company		8182 Maryland Avenue		St. Louis	MO	63105
N/A						
N/A						
N/A						

III. PREVIOUS OWNERS(S) *(List most recent first)*

01 NAME	02 D & B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Petroleum Marketing Corporation		unknown				
Crown Central Petroleum		unknown				
N/A						
N/A						

IV. REALTY OWNER(S) *(if applicable, list most recent first)*

10 NAME	11 D & B NUMBER	12 STREET ADDRESS (P.O. Box, RFD #, Etc.)	13 SIC CODE	14 CITY	15 STATE	16 ZIP CODE
N/A						
N/A						
N/A						
N/A						

IV. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NUS FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 2, 1990.
Maryland State file information.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. CURRENT OPERATOR *(Provide if different from owner)*

01 NAME	02 D & B NUMBER
same	

03 STREET ADDRESS *(P.O. Box, RFD #, Etc.)*	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER
1973 to 1990	

OPERATOR'S PARENT COMPANY *(if applicable)*

10 NAME	11 D & B NUMBER
same	

12 STREET ADDRESS *(P.O. Box, RFD #, Etc.)*	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR (S) *(List most recent first; provide if different from owner)*

PREVIOUS OPERATOR'S PARENT COMPANIES *(if applicable)*

01 NAME	02 D & B NUMBER	10 NAME	11 D & B NUMBER
same		Petroleum Fuel and Terminal Corporation	

03 STREET ADDRESS *(P.O. Box, RFD #, Etc.)*	04 SIC CODE	12 STREET ADDRESS *(P.O. Box, RFD #, Etc.)*	13 SIC CODE
		1622 Clinton Street	

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
			Baltimore	MD	21224

08 YEARS OF OPERATION	09 NAME OF OWNER
1973 to 1978	

01 NAME	02 D & B NUMBER	10 NAME	11 D & B NUMBER
same		N/A	

03 STREET ADDRESS *(P.O. Box, RFD #, Etc.)*	04 SIC CODE	12 STREET ADDRESS *(P.O. Box, RFD #, Etc.)*	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER
1947 to 1973	

01 NAME	02 D & B NUMBER	10 NAME	11 D & B NUMBER
N/A		N/A	

03 STREET ADDRESS *(P.O. Box, RFD #, Etc.)*	04 SIC CODE	12 STREET ADDRESS *(P.O. Box, RFD #, Etc.)*	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER

IV. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NUS FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 2, 1990.
Maryland State file information.

ORIGINAL

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. ON-SITE GENERATOR

01 NAME	02 D & B NUMBER
N/A	

03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D & B NUMBER	01 NAME	02 D & B NUMBER
N/A			

03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D & B NUMBER	01 NAME	02 D & B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D & B NUMBER	01 NAME	02 D & B NUMBER
N/A			

03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D & B NUMBER	01 NAME	02 D & B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, Etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NUS FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 2, 1990.

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	113

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ H. ON-SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MD	113

II. PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ S. CAPPING/COVERING 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ T. BULK TANKAGE REPAIRED 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ U. GROUT CURTAIN CONSTRUCTED 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ V. BOTTOM SEALED 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ W. GAS CONTROL 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ X. FIRE CONTROL 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ Y. LEACHATE TREATMENT 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ Z. AREA EVACUATED 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 1. ACCESS TO SITE RESTRICTED 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 2. POPULATION RELOCATED 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 3. OTHER REMEDIAL ACTIVITIES 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NUS FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 2, 1990.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MD	113

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ACTION [X] YES [ ] NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

September 16, 1983- The Maryland Waste Management Administration (MD WMA) conducted a preliminary assessment. A low-priority site inspection with appropriate sampling was recommended.

April 10, 1990- NUS FIT 3 conducted a site inspection.

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NUS FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 10, 1990.
Maryland State file information.

ORIGINAL
(Red)

SECTION 6

6.0 REFERENCES FOR SECTIONS 1.0 THROUGH 5.0

1. United States Geological Survey. Baltimore East, Maryland Quadrangle, 7.5 Minute Series. Topographic Map. 1953, photorevised 1974. Combined with Baltimore West, Maryland Quadrangle, 7.5 Minute Series. Topographic Map. 1953, photorevised 1974; and Curtis Bay, Maryland Quadrangle, 7.5 Minute Series. Topographic Map. 1969, photorevised 1974.

2. Weinhold, Jack, Petroleum Fuel and Terminal Company, with Richard Costello and Michael McCarthy, NUS FIT 3. Meeting. April 2, 1990.

3. NUS Corporation, FIT 3. Site inspection; site visit. TDD No. F3-9003-08, April 10, 1990.

4. Maryland Waste Management Administration. Preliminary Assessment of Crown Central Petroleum Corporation, Baltimore, Maryland. August 1984.

5. Reistetter, Paul, SGS Control Services, Incorporated, to Petroleum Fuel and Terminal Company. Correspondence. February 28, 1990.

6. Hartley, Brent, City of Baltimore Water Department, with Jill Hartnell, NUS FIT 3. Telecon. February 1, 1990.

7. Bittner, Howard, Montebello Filtration Plant, with Edward F. Jamison, NUS FIT 3. Telecon. July 20, 1989.

8. Vokes, H.E., and J. Edwards, Jr., Maryland Geological Survey. Geography and Geology of Maryland. Bulletin 19, 1957, revised and reprinted 1974.

9. Dore, Mary Ellen, Maryland Tidal Basin Commission, with Richard Costello, NUS FIT 3. Telecon. May 11, 1990.

10. United States Department of the Interior, Fish and Wildlife Service. Baltimore East, Maryland Quadrangle, 7.5 Minute Series. National Wetlands Inventory Map. 1981. Combined with Baltimore West, Maryland Quadrangle, 7.5 Minute Series. National Wetlands Inventory Map. 1981; Relay, Maryland Quadrangle, 7.5 Minute Series. National Wetlands Inventory Map. 1981; and Curtis Bay, Maryland Quadrangle, 7.5 Minute Series. National Wetlands Inventory Map. 1981.

ORIGINAL (Red)

11. Nutter, L.J., and E.G. Otton, Maryland Geological Survey. Ground-Water Occurrence in the Maryland Piedmont. Report of Investigations No. 10, 1969.

12. State of Maryland, Maryland Geological Survey. Geologic Map of Maryland. 1968.

13. United States Department of Agriculture, Soil Conservation Service. Soil Survey of Baltimore County, Maryland. 1976.

14. Dingman, R.J., H.F. Ferguson, and R.O.R. Martin, State of Maryland, Department of Geology, Mines and Water Resources. The Water Resources of Baltimore and Hartford Counties. Bulletin 17, 1956.

15. Otton, E.G., Maryland Geological Survey. Geologic and Hydrologic Factors Bearing on Subsurface Storage of Liquid Wastes in Maryland. Report of Investigations No. 14, 1970.

16. United States Environmental Protection Agency. Uncontrolled Hazardous Waste Site Ranking System; A User's Manual. 1984.

17. National Oceanic and Atmosphere Administration. Climatography of the United States. Local Climatological Data. Baltimore, Maryland. 1983.

18. Rand McNally. Commercial Reference Map and Guide. Delaware/Maryland. 1983.

19. Wolfin, John P., Supervisor, United States Department of the Interior, Fish and Wildlife Service, Division of Ecological Services, Annapolis, Maryland, to Garth Glenn, NUS FIT 3. Correspondence. April 18, 1990.

SECTION 7

7.0 LABORATORY DATA

7.1 Sample Data Summary

The attached data summary contains only compounds which were identified as detected in at least one sample. The complete list of compounds analyzed for, their results, and the associated detection limits are located as an appendix. Results for tentatively identified compounds appear following the organic data section of this report.

The following codes are used in the data summary to indicate the confidence in the laboratory results:

CODES RELATING TO IDENTIFICATION
(confidence concerning presence or absence of compounds):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

SITE NAME: Crown Central Petroleum
TDD NUMBER: F3-9003-06
LAB NAMES: Org:Hall Kenitus Inorg:Columbia Analytical Inc.

SELECTED SAMPLE ORDER
SAMPLING DATE(s): 4/10/90
CASE NUMBER: 13852

STATE/COUNTY CODE: MD/510
EPA NUMBER: MD-113

SAMPLE NUMBER:	CDR80	CDR81	CDR82	CDR83	CDR84	CDR86
SAMPLE ID:	AQ-1	AQ-2	AQ-10	AQ Blank	Sub-1	Sub-10
LOCATION:	Oil/water sep. dischg. No uses Clr, no odor	Oil/water Sep. St.pipe No uses Cloudy n odr	Duplicate of AQ-1	Blank	20'NW Tnk 11 6"deep V Dk sdy mst Diesel odor	Duplicate of Sub-1
pH:	6.5	4.1	6.5		8.4	8.5
FIELD MEASUREMENT:	None>bkg OVA	None>bkg OVA	None>bkg OVA	None bkg OVA	None>bkg OVA	None>bkg OVA
PERCENT SOLIDS:					83.0%	85.0%
TYPE OF DATA: ******	**********	**********	**********	**********	**********	**********
DILUTION FACTOR	1.0	33.0	1.0	1.0	1506.0	1470.6

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER: UNITS:	CDR80 ug/l	CDR81 ug/l	CDR82 ug/l	CDR83 ug/l	CDR84 ug/kg	CDR86 ug/kg
5.00 methylene chloride			510.00 B		1.00 J	9800.00 B	12000.00 B
10.00 acetone		15.00 B	610.00 B	20.00 B	6.00 J	40000.00 B	
5.00 1,1,1-trichloroethane							
5.00 benzene		23.00	2700.00	24.00		2700.00 J	3700.00 J
5.00 toluene		3.00 J	4600.00	3.00 J			
5.00 ethylbenzene		4.00 J	52.00 J	4.00 J			10000.00
5.00 total xylenes		62.00	1500.00	69.00		270000.00	340000.00
TYPE OF DATA: ******	VOLATILES	**********	**********	**********	**********	**********	**********
DILUTION FACTOR		1.0	2.0	1.0	1.0	4016.0	3922.0

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER: UNITS:	CDR80 ug/l	CDR81 ug/l	CDR82 ug/l	CDR83 ug/l	CDR84 ug/kg	CDR86 ug/kg
10.00 phenol			440.00				
10.00 2-methylphenol			8.00 J				
50.00 benzoic acid		2.00 J	8.00 J				
10.00 naphthalene						24000.00 J	
10.00 2-methylnaphthalene						83000.00	52000.00
10.00 acenaphthylene							
10.00 acenaphthene							6900.00 N
10.00 dibenzofuran							
10.00 fluorene						20000.00 J	17000.00 J
10.00 phenanthrene						41000.00	36000.00 J
10.00 anthracene							
10.00 fluoranthene						5300.00 J	9800.00 J
10.00 pyrene						9500.00 J	8000.00 J
10.00 benzo(a)anthracene							
10.00 chrysene						4100.00 J	
10.00 bis(2-ethylhexyl) phthalate			10.00 B				
10.00 benzo(b)fluoranthene							
10.00 benzo(k)fluoranthene							
10.00 benzo(a)pyrene							
10.00 indeno(1,2,3-cd)pyrene							
10.00 dibenz(a,h)anthracene							
10.00 benzo(g,h,i)perylene							
TYPE OF DATA: ******	PHENOLICS	**********	**********	**********	**********	**********	**********
DILUTION FACTOR		1.0	5.0	5.0	1.0	9639.0	9412.0

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER: UNITS:	CDR80 ug/l	CDR81 ug/l	CDR82 ug/l	CDR83 ug/l	CDR84 ug/kg	CDR86 ug/kg
1.00 aroclor-1254							

Comments: **********
Dilution factor greater than OR tested =2x, = =5x, t = 10x, ^ =25x, # =50x.
* =100x, 1 [illegible] OR by the bkgrnd soil was acss to public.

SELECTED SAMPLE ORDER

SITE NAME: Crown Central Petroleum
TDD NUMBER: F3-9007 06
LAB NAMES: Org:IT Corporation/Inorg:Columbia Analytical Inc.

SAMPLING DATE(s): 4/10/90
CASE NUMBER: 13852

STATE/COUNTY CODE: MD/510
EPA NUMBER: MD-113

SAMPLE NUMBER:	CDR85	CDR87	CDR88	CDR89	CDR90	CDR91
SAMPLE ID:	Sub-2	Sub-3	Sub-4	Sub-5	Sub-6	Sub-7
LOCATION:	5' 6"S M.Box 6" deep Br/Bk stains Gasoline odr	14' 8"W dike 3" deep sdy.pbls.mst Oil soaked	29' E dike 6" deep Dk Br Cly mst. No odor	17' 8" S Tk 1 valve.8"deep Bk/Br sdy mst. No odor	11' 6" NE Tk1 Access door 6" deep Sdy. Lg pbls	6' E of dike 2"deep conc. base. Dk brn mst silt org
pH:	8.4	7.8	7.8	7.9	8.4	8.0
FIELD MEASUREMENTS:	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA
PERCENT SOLIDS:	87.0%	74.0%	79.0%	90.0%	92.0%	62.0%
TYPE OF DATA: ****** VOLATILES	**********	**********	**********	**********	**********	**********
DILUTION FACTOR:	143.7	168.9	1.3	1.1	1.1	1.6

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER: UNITS:	CDR85 ug/kg	CDR87 ug/kg	CDR88 ug/kg	CDR89 ug/kg	CDR90 ug/kg	CDR91 ug/kg
5.00	methylene chloride	1200.00 B	1800.00 B	8.00 B	5.00 B	5.00 B	10.00 B
10.00	acetone	2900.00 B	18000.00 R	14.00 B	7.00 B	7.00 B	12.00 B
5.00	1,1,1-trichloroethane			4.00 B		4.00 B	3.00 B
5.00	benzene	1700.00	390.00 J				
5.00	toluene	2800.00	300.00 J				
5.00	ethylbenzene	3200.00	1500.00				
5.00	total xylenes	20000.00	1500.00				
TYPE OF DATA: ****** SEMI-VOLATILES		**********	**********	**********	**********	**********	**********
DILUTION FACTOR:		383.0	450.0	422.0	370.0	362.0	538.0

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER: UNITS:	CDR85 ug/kg	CDR87 ug/kg	CDR88 ug/kg	CDR89 ug/kg	CDR90 ug/kg	CDR91 ug/kg
10.00	phenol						
10.00	2-methylphenol						
50.00	benzoic acid						
10.00	naphthalene	7300.00	2000.00 J				
10.00	2-methylnaphthalene	7800.00	4500.00				
10.00	acenaphthylene		3400.00 J				
10.00	acenaphthene						
10.00	dibenzofuran		3900.00 J				
10.00	fluorene	770.00 J	4600.00				
10.00	phenanthrene		28000.00				
10.00	anthracene		5200.00				
10.00	fluoranthene	730.00 J	28000.00			1100.00 J	1400.00 J
10.00	pyrene	570.00 J	19000.00			780.00 J	1100.00 J
10.00	benzo(a)anthracene		11000.00			470.00 J	740.00 J
10.00	chrysene		10000.00			510.00 J	880.00 J
10.00	bis(2-ethylhexyl) phthalate						1600.00 B
10.00	benzo(b)fluoranthene		7900.00			460.00 J	920.00 J
10.00	benzo(k)fluoranthene		7200.00			410.00 J	690.00 J
10.00	benzo(a)pyrene		7200.00			420.00 J	560.00 J
10.00	indeno(1,2,3-cd)pyrene		2900.00 J				
10.00	dibenz(a,h)anthracene		880.00 J				
10.00	benzo(g,h,i)perylene		2300.00 J				
TYPE OF DATA: ****** PESTICIDES		**********	**********	**********	**********	**********	**********
DILUTION FACTOR:		920.0	2162.0	5.0	1.0	1.0	5.0

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER: UNITS:	CDR85 ug/kg	CDR87 ug/kg	CDR88 ug/kg	CDR89 ug/kg	CDR90 ug/kg	CDR91 ug/kg
1.00	aroclor-1254				120.00 N		

Comments: **********

Dilution factors greater than 1X listed: ' =2x, " =5x, t = 10x, ^ =25x, # =50x, ! =100x, t = 1000x

Only the bkgrnd soil was acss to public.

FINAL

SELECTED SAMPLE ORDER

SITE NAME: Crown Central Petroleum
SAMPLING DATE(s): 4/10/90
STATE/COUNTY CODE: MD/510
IDD NUMBER: F3-9003-08
CASE NUMBER: 13852
EPA NUMBER: MD-113
LAB NAMES: Org:IT Cerritos-Inorg:Columbia Analytical Inc.

SAMPLE NUMBER:	CDR92	CDR93	CDR94	CDR98	CDR95	CDR96
SAMPLE ID:	Sub-8	Sub-9	SD-1	SD-10	S-Back	Trip Blank
LOCATION:	10'4"S Tk 16 8" deep vry dk brn mst sdy slt	87' S of slag dike 8" deep Brn sd pbls	Dn strm of Oil/Water sp Matches AQ-1 Oil odor	Duplicate of SD 1	Off-site bkg ind-acss some veg sdy slt pbls	Trip Blank VOA only
PH:	8.1	8.0	8.0	8.0	8.0	
FIELD MEASUREMENTS:	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA
PERCENT SOLIDS:	90.0%	88.0%	70.0%	67.0%	93.0%	
TYPE OF DATA: ****** VOLATILES	**********	**********	**********	**********	**********	**********
DILUTION FACTOR:	1.1	1.1	1.4	1.5	1.1	1.0

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER: UNITS:	CDR92 ug/kg	CDR93 ug/kg	CDR94 ug/kg	CDR98 ug/kg	CDR95 ug/kg	CDR96 ug/l
5.00	methylene chloride	5.00 B	4.00 B	11.00 B	11.00 B	6.00 B	
10.00	acetone	6.00 B	7.00 B	15.00 B		6.00 B	5.00 J
5.00	1,1,1-trichloroethane						
5.00	benzene						
5.00	toluene						
5.00	ethylbenzene						
5.00	total xylenes			4.00 J			
TYPE OF DATA: ****** SEMIVOLATILES		**********	**********	**********	**********	**********	**********
DILUTION FACTOR:		370.0	378.8	439.0	450.0	439.0	0.0

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER: UNITS:	CDR92 ug/kg	CDR93 ug/kg	CDR94 ug/kg	CDR98 ug/kg	CDR95 ug/kg	CDR96 n/a
10.00	phenol						
10.00	2-methylphenol						
50.00	benzoic acid						
10.00	naphthalene		550.00 J				
10.00	2-methylnaphthalene		570.00 J				
10.00	acenaphthylene		3200.00 J				
10.00	acenaphthene						
10.00	dibenzofuran		2100.00 J				
10.00	fluorene		3400.00 J				
10.00	phenanthrene		27000.00	1100.00 J			
10.00	anthracene		7100.00				
10.00	fluoranthene	2500.00 J	33000.00	2400.00 J			
10.00	pyrene	2000.00 J	23000.00	2100.00 J	1300.00 J		
10.00	benzo(a)anthracene	1000.00 J	16000.00	1300.00 J			
10.00	chrysene	1000.00 J	14000.00	1300.00 J			
10.00	bis(2-ethylhexyl) phthalate		4400.00				
10.00	benzo(b)fluoranthene	870.00 J	17000.00	1300.00 J			
10.00	benzo(k)fluoranthene	1000.00 J	10000.00	1100.00 J			
10.00	benzo(a)pyrene	890.00 J	12000.00	1100.00 J			
10.00	indeno(1,2,3-cd)pyrene	550.00 J	7400.00	790.00 J			
10.00	dibenz(a,h)anthracene		2000.00 J				
10.00	benzo(g,h,i)perylene	500.00 J	6200.00	680.00 J			
TYPE OF DATA: ****** PESTICIDES		**********	**********	**********	**********	**********	**********
DILUTION FACTOR		1.0	5.0	5.0	20.0	5.0	0.0

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER UNITS:	CDR92 ug/kg	CDR93 ug/kg	CDR94 ug/kg	CDR98 ug/kg	CDR95 ug/kg	CDR96 n/a
1.00	aroclor 1254			750.00 J	1500.00 J		

Comments: **********

Dilution factor greater than 10 listed: =2x, " =5x, t = 10x, ^ =25x, # =50x, ! =100x, ! =[illegible]

Only the bkgrnd soil was acss to public.

SELECTED SAMPLE ORDER

SITE NAME: Crown Central Petroleum
TDD NUMBER: F3-9005-08
LAB NAMES: Org:IT Corporation Inorg:Columbia Analytical Inc.

SAMPLING DATE(s): 4/10/90
CASE NUMBER: 13852

STATE/COUNTY CODE: MD/510
EPA NUMBER: MD-113

SAMPLE NUMBER:	MCCD00	MCCD02	MCCD01	MCCD03	MCCD04	MCCD06
SAMPLE ID:	AQ-1	AQ-10	AQ-2	AQ Blank	Sub-1	Sub-10
LOCATION:	Oil/water sep. dischg. No uses Clr, no odor	Duplicate of AQ-1	Oil/Water Sep. St.pipe No uses Cloudy n odr	Blank	20'NW Tnk 11 6"deep V Dk soy mst Diesel odor	Duplicate of Sub-1
pH:	6.5	6.5	4.1		8.4	8.5
FIELD MEASUREMENT:	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA
PERCENT SOLIDS:					88.6%	85.7%
TYPE OF DATA: ****** INORGANICS	**********	**********	**********	**********	**********	**********
DILUTION FACTOR: GFAA	1.000	1.000	1.000	1.000	0.226	0.233
ICP	1.000	1.000	1.000	1.000	0.226	0.233
Hg	1.000	1.000	1.000	1.000	0.513	0.556
CN	1.000	1.000	1.000	1.000	0.056	0.058

CRQL (*=IDL)	CAS NUMBER	UNITS:	MCCD00	MCCD02	MCCD01	MCCD03	MCCD04	MCCD06
			ug/l	ug/l	ug/l	ug/l	mg/kg	mg/kg
* 20.00	aluminum		999.00 J	1950.00 J	668.00 J		8970.00	8130.00
* 20.00	antimony							
* 1.00	arsenic		61.40 J	104.00"J	7.00 J		71.10^J	63.70tJ
*1200.00	barium		84.40	108.00	33.90		327.00	297.00
* 1.00	beryllium			1.00			0.93	0.91
* 2.00	cadmium							
* 10.00	calcium		122000.00	121000.00	26900.00	34.50	5840.00	5500.00
* 3.00	chromium		23.30	25.80	7.20 B		119.00	112.00
* 4.00	cobalt						9.30	8.70
* 2.00	copper		212.00	360.00	175.00		1270.00	1070.00
* 4.00	iron		3650.00	6180.00	1530.00	17.10	39400.00	38900.00
* 1.00	lead (anal. by GFAA)							
* 20.00	lead (anal. by ICP)		487.00	420.00	157.00		3500.00	3620.00
* 50.00	magnesium		15500.00	15600.00	5510.00		1020.00	896.00
* 1.00	manganese		367.00	434.00	249.00		194.00	196.00
* 0.20	mercury						0.33	0.38
* 10.00	nickel			15.60			21.40	21.00
* 700.00	potassium		33500.00	32500.00	3450.00		457.00 B	531.00 B
* 2.00	selenium						2.60 B	2.60 B
* 2.00	silver						3.90 J	4.00 J
* 60.00	sodium		67100.00	65100.00	36800.00		518.00	474.00
* 1.00	thallium		1.30 B	1.90 B			1.30 B	1.40 B
* 3.00	vanadium		14.80	20.20	8.50		62.60	53.80
* 2.00	zinc		290.00	371.00	319.00		406.00	375.00
* 10.00	cyanide			32.40 J	72.30 J		49.10	63.80

Comments: **********
Dilution factors greater than DF listed: ' =2x, " =5x, t = 10x, ^ =25x, # =50x,
! =100x, f =500x
Only the bkgrnd soil was acss to public.

SELECTED SAMPLE ORDER

SITE NAME: Crown Central Petroleum
TDD NUMBER: F3-9003-08
LAB NAMES: Org:Il Cerritos;Inorg:Columbia Analytical Inc.

SAMPLING DATE(s): 4/10/90
CASE NUMBER:13852

STATE/COUNTY CODE: MD/510
EPA NUMBER: MD-113

SAMPLE NUMBER:	MCCD05	MCCD07	MCCD08	MCCD09	MCCD10	MCCD11
SAMPLE ID:	Sub-2	Sub-3	Sub-4	Sub-5	Sub-6	Sub-7
LOCATION:	5'6"S M.Box 6" deep Br/Bk stains Gasoline odr	14'8"W dike 3" deep sdy.pbls.mst Oil soaked	29' E dike 6" deep Dk Br Cly mst. No odor	17'8"S Tk 1 valve.8"deep Bk/Br sdy mst. No odor	11'6' NE Tk1 Access door 6" deep sdy, Lg pbls	6' E of dike 2"deep conc. base. Dk brn mst silt org
PH:	8.4	7.8	7.8	7.9	8.4	8.0
FIELD MEASUREMENTS:	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA
PERCENT SOLIDS:	87.4%	74.8%	77.5%	91.1%	92.4%	64.7%
TYPE OF DATA: ****** INORGANICS	**********	**********	**********	**********	**********	**********
DILUTION FACTOR: : GFAA	0.229	0.267	0.258	0.220	0.217	0.309
. ICP	0.229	0.267	0.258	0.220	0.217	0.309
: mg	0.545	0.668	0.586	0.477	0.515	0.773
: CN	0.057	0.067	0.065	0.055	0.054	0.077

DET. LIMIT CRQL (*=IDL)	SAMPLE NUMBER: / UNITS:	MCCD05 mg/kg	MCCD07 mg/kg	MCCD08 mg/kg	MCCD09 mg/kg	MCCD10 mg/kg	MCCD11 mg/kg
* 20.00	aluminum	3820.00	7570.00	5370.00	8130.00	4630.00	9360.00
* 20.00	antimony		14.80 L				21.60 L
* 1.00	arsenic	56.10tJ	759.00!J	54.70tJ	2.20 J	27.30tJ	45.10tJ
*1200.00	barium	50.40	236.00	108.00	26.90	77.30	164.00
* 1.00	beryllium	0.66	1.10	0.94	0.74	0.67	1.80
* 2.00	cadmium			0.77 J			
* 10.00	calcium	34300.00	26800.00	13200.00	1270.00	57000.00	22400.00
* 3.00	chromium	42.10	57.40	85.90	34.60	20.30	246.00
* 4.00	cobalt	3.40	9.90	6.70	15.70	4.30	21.90
* 2.00	copper	291.00	4440.00	4920.00	136.00	1280.00	813.00
* 4.00	iron	11000.00	36300.00	15500.00	24200.00	11500.00	87000.00
* 1.00	lead (anal. by GFAA)						3460.00f
* 20.00	lead (anal. by ICP)	263.00	499.00	323.00	19.00	165.00	
* 50.00	magnesium	9920.00	5910.00	4810.00	761.00	19700.00	16100.00
* 1.00	manganese	193.00	198.00	193.00	352.00	191.00	2220.00
* 0.20	mercury	0.13	2.00	0.33		0.16	0.56
* 10.00	nickel	14.10	70.70	35.80	9.10	26.10	115.00
* 700.00	potassium	690.00 B	1490.00	703.00 B	527.00 B	1150.00	1780.00
* 2.00	selenium	3.80 J	2.80 B	2.40 B		23.20"J	4.50 J
* 2.00	silver	1.10 J	4.10 J	5.60 J	1.50 J	4.40 J	6.40 J
* 60.00	sodium	112.00	450.00	375.00	44.90	84.40	1400.00
* 1.00	thallium	0.46 B	3.20	0.80 B	0.48 B	0.48 B	1.60 B
* 3.00	vanadium	28.50	39.20	89.10	32.40	22.80	151.00
* 2.00	zinc	332.00	974.00	1620.00	27.70	145.00	1510.00
* 10.00	cyanide	17.70	66.60	75.80	2.30	12.50	37.00

Comments: **********
Dilution factors greater than 1 : DF listed: ' =2x, " =5x, t = 10x, \ =25x, # =50x,
^ =100x, t 500x
Only the bkgrnd soil was acss to public.

SELECTED SAMPLE ORDER

SITE NAME: Crown Central Petroleum
TDD NUMBER: F3-9003-06
LAB NAMES: Org:II Certified/Inorg:Columbia Analytical Inc.

SAMPLING DATE(s): 4/10/90
CASE NUMBER:13852

STATE/COUNTY CODE: MD/510
EPA NUMBER: MD-113

SAMPLE NUMBER:	MCCD12	MCCD13	MCCD14	MCCD17	MCCD15
SAMPLE ID:	Sub-8	Sub-9	SD 1	SD-10	S-Back
LOCATION:	10'4"S Tk 16 8" deep vry dk brn mst sdy slt	87' S of slag dike 8" deep Brn sd pbls	Dn strm of Oil/Water sp Matches AQ-1 Oil odor	Duplicate of SD-1	Off site bkg ind-acss some veg sdy slt pbls
pH	8.1	8.0	8.0	8.0	8.0
FIELD MEASUREMENTS	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA	None>bkg OVA
PERCENT SOLIDS	89.8%	88.8%	76.6%	75.0%	89.7%
TYPE OF DATA: ****** ORGANICS	**********	**********	**********	**********	**********
DILUTION FACTOR for AA	0.223	0.225	0.261	0.267	0.223
" ICP	0.223	0.225	0.261	0.267	0.223
" mg	0.557	0.536	0.622	0.667	0.531
" CN	0.056	0.056	0.065	0.067	0.056

DET. LIMIT RQL (*=IDL)	SAMPLE NUMBER: / UNITS:	MCCD12 mg/kg	MCCD13 mg/kg	MCCD14 mg/kg	MCCD17 mg/kg	MCCD15 mg/kg
* 20.00	aluminum	6030.00	3990.00	5090.00	6130.00	4380.00
* 20.00	antimony		48.00 L			
* 1.00	arsenic	6.60'J	158.00#J	389.00#L	507.00#L	2.40'L
*1200.00	barium	81.10	289.00	319.00	295.00	44.90
* 1.00	beryllium	1.00	0.86	0.98	1.00	0.84
* 2.00	cadmium				0.59	
* 10.00	calcium	34500.00	12900.00	10100.00	7190.00	22100.00
* 3.00	chromium	31.80	55.40	72.30	308.00	26.00
* 4.00	cobalt	6.30	7.60	5.40	8.00	9.90
* 2.00	copper	391.00	11000.00	1340.00	862.00	192.00
* 4.00	iron	13300.00	25800.00	27700.00	26000.00	23700.00
* 1.00	lead (anal. by GFAA)					125.00#
* 20.00	lead (anal. by ICP)	125.00	657.00	831.00	2930.00	
* 50.00	magnesium	10700.00	3080.00	1810.00	1300.00	9220.00
* 1.00	manganese	200.00	249.00	234.00	164.00	328.00
* 0.20	mercury	0.52	0.83	0.28	0.31	0.12
* 10.00	nickel	32.30	179.00	23.60	26.40	57.50
* 700.00	potassium	646.00 B	342.00 B	953.00 B	1170.00	622.00 B
* 2.00	selenium	0.65 B	62.20tJ	4.20	5.60	0.69 B
* 2.00	silver	0.91 J	31.40 J	2.30	3.00	1.30
* 60.00	sodium	114.00	159.00	281.00	257.00	74.10 J
* 1.00	thallium	0.31 B	0.59 B	3.20	3.40	0.47 B
* 3.00	vanadium	20.90	60.40	76.40	61.70	28.30
* 2.00	zinc	859.00	498.00	894.00	1270.00	170.00
* 10.00	cyanide	16.40	62.10	49.20	61.20	17.80

Comments: **********
Dilution factors greater than DF listed: ' =2x, " =5x, t = 10x, ^ =25x, # =50x,
' =100x, ' =500x.
Only the bkgrnd soil was acss to public.

7.2 Quality Assurance Review

7.2.1 Organic Data: Lab Case 13852

7.2.1.1 Introduction

Four aqueous and 13 solid samples were analyzed for volatile, base-neutral, acid, pesticide, and polychlorinated biphenyl (PCB) compounds through the EPA Contract Laboratory Program (CLP). Included in this sample set were an aqueous blank and duplicate pairs for the aqueous and solid matrices. One trip blank was analyzed for volatile compounds only. The sample locations mostly consisted of subsurface soil samples.

The data have been fully reviewed to determine the usability of results according to the National and Regional Guidelines (areas examined in detail are listed in the Support Documentation appendix). Moderately high levels of polycyclic aromatic hydrocarbons (PAHs) were detected in several locations, and low levels of PAHs were detected in other locations. Four PAHs not reported by the laboratory have been added to the data summary by the reviewer. Benzene, toluene, and xylenes (BTXs) were detected in several samples at appreciable levels, and related compounds, not included in the target compound list, were detected in the gas chromatography/mass spectrometry (GC/MS) analyses of these samples. Low levels of a PCB were detected in three samples; two are field duplicates.

Overall, data quality was good, as demonstrated by good internal standard, surrogate, and matrix spike recoveries. The data indicate that the laboratory was able to detect most compounds at the detection limits reported, although the detection limit for one volatile compound should be considered estimated in some samples due to a low response factor (RF) in the associated calibration standards. Two results for a PCB should be considered estimated as a result of sample inhomogeneity. Blank contamination was not extensive and affected results for four compounds only (three are common contaminants).

7.2.1.2 Qualifiers

- Several compounds were detected in field or laboratory blanks associated with this case. Results in samples that were detected at levels attributable to the contamination displayed by the blanks have been flagged (B) on the data summary to indicate that they are probable artifacts. The following table lists the compounds detected in the blanks, along with the samples affected.

Compound	Samples Affected
methylene chloride	all samples
acetone	all samples except Sub-3 (sample CDR87)
1,1,1-trichloroethane	all samples
bis(2-ethylhexyl) phthalate	all samples except Sub-9 (sample CDR93)

- The (B) flag was not applied to results in field blanks CDR83 and CDR96.

- The acetone result in Sub-3 (sample CDR87) has been flagged unreliable (R) on the data summary. Studies have found acetone to be a laboratory contaminant more than 50 percent of the time in CLP cases when detected at low levels. Although the acetone level in sample CDR87 was above the level that can technically be questioned by the blanks, the instrument level of this compound in sample CDR87 was low (less than 10 ng); therefore, its presence should not be considered reliable unless confirmed by further evidence.

- The laboratory's screening procedure detected high levels of volatile compounds in Sub-1, Sub-2, Sub-10, and Sub-3 (samples CDR84 through CDR87). The laboratory therefore analyzed the volatile fraction of these samples using the medium-level protocols. High and moderate levels of BTXs were detected in all four samples. Quality control data for the results were good, and, therefore, the presence of and quantitation for these compounds should be considered confident. The detection of similar benzene-based petroleum by-products in the list of tentatively identified compounds (TICs) from the semivolatile analysis of these samples is further evidence of BTXs' presence at the respective sample locations.

- The 2-butanone RF was low (less than 0.05) in all calibration standards associated with the medium-level analyses, and, therefore, the detection limit for 2-butanone should be considered estimated in samples CDR84 through CDR87. A low RF indicates poor instrument sensitivity; however, with 2-butanone, it should be noted that the required quantitation ion is a small part of the analyte spectrum. Therefore, although the RF was low, the instrumentation was probably functioning properly. Low RFs are a common problem with 2-butanone.

- The extraction of AQ-1 (sample CDR80) for the semivolatile analysis was performed six days after the contractual holding time had expired. The only reported result (for benzoic acid) should therefore be considered biased low and has been flagged biased low (L) on the data summary to indicate this. Detection limits for all semivolatile compounds in this sample may be slightly higher than reported as well.

- The reviewer has added 2-methylphenol to the data summary in AQ-2 (sample CDR81) and fluorene and fluoranthene to the data summary in Sub-10 (sample CDR86). An inspection of the raw data revealed peaks at the expected retention times for these compounds, as predicted by the daily calibration standards, and the spectra for these compounds matched well with reference spectra. These results should be considered confident. Acenaphthene has also been added to the data summary in Sub-10 (sample CDR86). The spectrum for this compound matched well with reference spectra: all characteristic peaks were present and the ratios of those peaks matched the standard. Acenaphthene has been flagged as tentatively identified (N) on the data summary, however, because, when the shift in the internal standard in the calibration standard is taken into account, the retention time of this compound in sample CDR86 is slightly off from the predicted value. The instrument level for this compound was low (approximately 2.0 ug/l), and, although related PAHs were detected in this sample and acenaphthene was detected in a similar sample from the subject site, further information should be obtained before the presence of this compound in CDR86 is considered confident.

- The presence of Aroclor 1254 should be considered confident in SD-1 and SD-10 (samples CDR94 and CDR98). The retention times and peak pattern matched with the standards for this PCB. Because these two samples were taken at the same sampling location (field duplicates), the detection of Aroclor 1254 in both samples is strong corroborating evidence supporting its presence in each one. The data were not corroborated by the semivolatile

GC/MS analysis; however, the low instrument levels found are below the normal detection capability of that method.

- The quantitation for Aroclor 1254 in samples CDR94 and CDR98 should be considered estimated because of the large difference between the results for that compound in these two field duplicates. The discrepancy between the two results can be attributed to sample inhomogeneity (a common phenomenon in sediment samples); however, the effect on the data is that the Aroclor 1254 concentration at this sampling location should not be considered accurate. Further sampling information would be helpful if it is necessary to pinpoint the precise level of this compound at that location.

- The Aroclor 1254 result in Sub-5 (sample CDR89) has been flagged tentatively identified (N) on the data summary. Although the peak pattern matched well with standards in the primary column, it did not match well on the second column. The compound was not detected in adjacent samples and was not detected in the semivolatile GC/MS analysis for this sample (although the detected level would be expected to be below the detection capability of that method). The instrument level was low, and the sample contained a large amount of interferences. Further information should be obtained before this result is considered confident.

- Sample results that are below the calibration range of the analysis have been flagged as estimated (J), where no other flag exists.

- TICs that are not demonstrated artifacts of laboratory contaminants are summarized immediately following this report.

7.2.1.3 Support Data

The Support Documentation appendix to this report documents the above findings associated with laboratory contamination, poor response factors, surrogate and matrix spike recoveries, and the compounds added by the reviewer. This report has been formatted to address only those issues directly affecting the application of the data to the subject investigations. Issues pertaining to contractual compliance have been itemized on a separate report, addressed to the technical project officer for the laboratory.

Report prepared by Daniel Benedikt
(215) 687-9510

Report reviewed by Roy Cohen
(215) 687-9510

CASE 13852

SAMPLE DATA SUMMARY: ORGANIC TENTATIVELY IDENTIFIED COMPOUNDS

ORIGINAL (Red)

SAMPLE ID	SAMPLE NUMBER	ANALYSIS FRACTION (VOA/BNA)	ESTIMATED CONCENTRATION VALUE	ESTIMATED CONCENTRATION UNITS	QUALIFIER CODE	COMPOUND NAME
AQ-1	CDR80	VOA	30	ug/l	ISO	METHYLETHYL BENZENE (C_9H_{12}) CAS# 611-14-3
			7		ISO	METHYL CYCLO PENTANE (C_6H_{12}) CAS# 96-37-7
			20		UNK	OXYGEN CONTAINING UNKNOWN
		BNA	42		ISO	1,4-DICHLORO-2-ISOCYANATO BENZENAMINE
						($C_7H_3ONCl_2$) CAS# 5392-82-5
			12		ISO	3,5-DICHLORO BENZENAMINE ($C_6H_5NCl_2$) CAS# 626-43-7
AQ-2	CDR81	VOA	230	ug/l	ISO	2-METHYL-1-ETHYL-BENZENE (C_9H_{12}) CAS# 611-14-3
			3300		ISO	2-METHOXY-2-METHYL PROPANE ($C_5H_{12}O$) CAS# 1634-04-4
		BNA	64			6-CHLORO-N,N'-DIETHYL-1,3,5-TRIAZINE-
						2,4-DIAMINE ($C_7H_{12}N_5Cl$) CAS# 122-34-9
			28		MIX	1,3,6-TRIMETHYL NAPHTHALENE ($C_{13}H_{14}$) + COEL. UNKNOWN
			48		ISO	1-ETHENYL-2-METHYL BENZENE (C_9H_{10}).
						CAS# 611-15-4
			268		TOT(3) ISO	1-ETHYL-2-METHYL BENZENE (C_9H_{12})
						CAS# 611-14-3
			1014		TOT(12)	SATURATED HC
			140		UNK	UNSATURATED HC, POSSIBLY OXYGEN CONT
			40		UNK	UNSATURATED HC
AQ-10 (dup AQ1)	CDR82	VOA	8	ug/l	ISO	1-ETHYL-2-METHYL-BENZENE (C_9H_{12}) CAS# 611-14-3
			20			METHYL CYCLOPROPANE (C_6H_{12}) CAS# 96-37-7
			20			2-METHOXY-2-METHYL PROPANE CAS# 1634-4-4
		BNA	130			6-CHLORO-N,N'-DIETHYL-1,3,5-TRIAZINE-2,4-
						DIAMINE ($C_7H_{12}N_5Cl$) CAS# 122-34-9
			8		TOT(2) UNK	SATURATED HC UNKNOWN
			26			

DEFINITIONS OF QUALIFIER CODES:

SUS = SUSPECTED FALSE POSITIVE RESULT: Compound is either a common laboratory contaminant, or else possible reaction byproduct (artifact) attributable to the chemical reagents used for sample preparation and analysis. This result is suspect even though this compound was not found in any associated blanks.

UNK = UNKNOWN COMPOUND: Library search result unreasonable or of very low matching quality.

TOT = TOTAL CONCENTRATION REPORTED: Represents the sum of several compounds detected all belonging to the same chemical class.

ISO = OR ISOMER: Compound identification is not selective for this isomer only. This result may indicate the presence of a similar compound comprised of the same atoms bonded together in a different arrangement or substitution pattern.

HC = hydrocarbon

MIX = mixture of coeluting compounds

CASE 13852

SAMPLE DATA SUMMARY: ORGANIC TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE ID	SAMPLE NUMBER	ANALYSIS FRACTION (VOA/BNA)	ESTIMATED CONCENTRATION VALUE	ESTIMATED CONCENTRATION UNITS	QUALIFIER CODE	COMPOUND NAME
Sub-1	CDR84	VOA	250,000	ug/kg	TOT(2) ISO	4-ETHYL-1,2-DIMETHYL-BENZENE ($C_{10}H_{14}$)
			—			CAS# 25340-17-4
			690,000		TOT(4) ISO	1-ETHYL-2-METHYL-BENZENE (C_9H_{12}) CAS# 611-14-3
			30,000			2-AZIDO-2,3,3-TRIMETHYL BUTANE ($C_7H_{15}N_3$)
			—			CAS# 51677-41-9
			235,700		TOT(3)	SATURATED HC
		BNA	130,000			1-METHYL NAPATHALENE ($C_{11}H_{10}$) CAS# 90-12-0
			580,000		TOT(3) ISO	2-ETHYL-1,3-DIMETHYL BENZENE ($C_{10}H_{14}$) CAS# 2870-4-4
			140,000		ISO	2,3-DIHYDRO-4-METHYL-1H-INDENE ($C_{10}H_{12}$) CAS# 874-35-1
			180,000			OCTAHYDRO HEXAMETHYL-1H-INDENE ($C_{15}H_{28}$)
			—			CAS# 54832-83-6
			850,000		TOT(4) ISO	1-ETHYL-3-METHYL-BENZENE (C_9H_{12}) CAS# 611-14-3
			100,000		ISO	1-ETHENYL-2-METHYL BENZENE (C_9H_{10}) CAS# 611-15-4
			3,590,000		TOT(9)	SATURATED HC
Sub-2	CDR85	VOA	114,000	ug/kg	TOT(2) ISO	DIETHYL BENZENE ($C_{10}H_{14}$) CAS# 25340-17-4
			210,000		TOT(3) ISO	1-ETHYL-2-METHYL BENZENE (C_9H_{12}) CAS# 611-14-3
			87,500		TOT(6) ISO	SATURATED HC
			2,040		UNK	OXYGEN CONTAINING UNKNOWN
		BNA	2300			6-CHLORO-N,N'-DIETHYL-1,3,5-TRIAZINE-2,4-
			—			DIAMINE ($C_7H_{12}N_5Cl$) CAS# 122-34-9
			7300		TOT(2) ISO	1,5-DIMETHYL NAPHTHALENE ($C_{12}H_{12}$) CAS# 571-61-9
			81,000		TOT(5) ISO	2-ETHYL-1,3-DIMETHYL-BENZENE ($C_{10}H_{14}$) CAS# 2870-4-4
			10,000		ISO	2,3-DIHYDRO-4-METHYL-1H-INDENE ($C_{10}H_{12}$)
			—			CAS# 874-35-1
			87,000		TOT(3) ISO	1-ETHYL-2-METHYL-BENZENE (C_9H_{12}) CAS# 611-14-3
			13,000		ISO	1-ETHENYL-2-METHYL-BENZENE (C_9H_{10}) CAS# 611-15-4
			48,100		TOT(7)	SATURATED HC

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TOT = TOTAL CONCENTRATION REPORTED: Represents the sum of several compounds detected all belonging to the same chemical class.

ISO = OR ISOMER: Compound identification is not selective for this isomer only. This result may indicate the presence of a similar compound comprised of the same atoms bonded together in a different arrangement or substitution pattern.

HC = hydrocarbon

mix = mixture of coeluting compounds

CASE 13852

SAMPLE DATA SUMMARY: ORGANIC TENTATIVELY IDENTIFIED COMPOUNDS

ORIGINAL (Red)

Sample ID	SAMPLE NUMBER	ANALYSIS FRACTION (VOA/BNA)	ESTIMATED CONCENTRATION VALUE	ESTIMATED CONCENTRATION UNITS	QUALIFIER CODE	COMPOUND NAME
Sub-10 (dup Sub-1)	CDR86	VOA	150,000	ug/kg		2-AZIDO-2,3,3-TRIMETHYL-BUTANE ($C_7H_{15}N_3$) (CAS# 51677-4-9)
			423,800		TOT(5)	SATURATED HC
			44,000		TOT(2) UNK	UNSATURATED HC
			117,000		TOT(2) UNK	UNKNOWN
		BNA	110,000		ISO	1,5-DIMETHYL-NAPHTHALENE ($C_{12}H_{12}$) CAS# 571-61-9
			140,000		ISO	1-ETHYL-2,3-DIHYDRO-1H-INDENE ($C_{11}H_{14}$) CAS# 4830-99-3
			660,000		TOT(4) ISO	2-ETHYL-1,3-DIMETHYL BENZENE ($C_{10}H_{14}$) CAS# 2870-4-4
			940,000		TOT(5) ISO	1-ETHYL-3-METHYL BENZENE (C_9H_{12}) CAS# 611-14-3
			2,240,000		TOT(7)	SATURATED HC
			380,000		UNK	UNSATURATED HC
			120,000		UNK	UNKNOWN
Sub-3	CDR87	VOA	8,880	ug/kg	TOT(4)	SATURATED HC
			11,200		TOT(5) UNK	UNSATURATED HC
			7,100		UNK	UNSATURATED HC, PROBABLY OXYGEN CON
			6,200		UNK	UNKNOWN
		BNA	32,000		ISO	1,5-DIMETHYL NAPHTHALENE ($C_{12}H_{12}$) CAS# 571-61-9
			5,800			DECAHYDRO-2-METHYLNAPHTHALENE ($C_{11}H_{20}$) CAS# 2958-76-1
			14,400		TOT(2) ISO	1-ETHYL-2,3-DIHYDRO-1H-INDENE ($C_{11}H_{14}$) CAS# 4830-99-3
			4,600		ISO	DECAHYDRONAPHTHALENE ($C_{10}H_{18}$) CAS# 91-17-8
			6,800		ISO	2-ETHYL-1,3-DIMETHYL BENZENE ($C_{10}H_{14}$) CAS# 2870-4-4
			276,800		TOT(11)	SATURATED HC
			11,200		TOT(2) UNK	UNSATURATED HC
			30,000		MIX UNK	SATURATED HC + COELUTING UNKNOWN
Sub-4	CDR86 (cont)	VOA				None detected

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TOT = TOTAL CONCENTRATION REPORTED: Represents the sum of several compounds detected all belongin to the same chemical class.

ISO = OR ISOMER: Compound identification is not selective for this isomer only. This result may instead repr the presence of a similar compound comprised of the same atoms bonded together in a different arrangem or substitution pattern.

HC = hydrocarbon

MIX = mixture of coeluting compounds

SAMPLE DATA SUMMARY: ORGANIC TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE ID	SAMPLE NUMBER	ANALYSIS FRACTION (VOA/BNA)	ESTIMATED CONCENTRATION VALUE	ESTIMATED CONCENTRATION UNITS	QUALIFIER CODE	COMPOUND NAME
Sub-4	CDR88 (Cont)	BNA	22,300	ug/kg	TOT(9)	SATURATED HC
Sub-5	CDR89	VOA				None detected
	↓	BNA				None detected
Sub-6	CDR90	VOA				None detected
	↓	BNA	2,200	ug/kg		BIS(2-ETHYLHEXYL) HEXANEDIOIC ACID ESTER ($C_{22}H_{24}O_4$) CAS# 103-23-1
	↓	↓	3,300	↓		SULFUR (S_8) CAS# 10544-50-0
Sub-7	CDR91	VOA				
	↓	BNA	2,700	ug/kg		OLEAN-18-ENE ($C_{30}H_{50}$) CAS# 432-11-1
		↓	5,400	↓		6-CHLORO-N,N'-DIETHYL-1,3,5-TRIAZINE-2,4-DIAMINE ($C_7H_{12}N_5Cl$) CAS# 122-34-9
			2,100			1,4-DICHLORO-2-ISOCYANATO-BENZENE ($C_7H_3ONCl_2$) CAS# 5392-82-5
			2,700			MONO(2-ETHYLHEXYL) HEXANEDIOIC ACID ESTER ($C_{14}H_{26}O_4$) CAS# 4337-65-9
			5,900		TOT(2)	UNKNOWN CYCLIC, POSSIBLE TRITERPANE HYDROCARBON
	↓	↓	28,800	↓	TOT(9)	SATURATED HC
Sub-8	CDR92	VOA				None detected
	↓	BNA	1500	ug/kg		MONO(2-ETHYLHEXYL) HEXANEDIOIC ACID ESTER ($C_{14}H_{26}O_4$) CAS# 4337-65-9
	↓	↓	1500	↓	UNK	CYCLIC, POSSIBLE TRITERPANE HYDROCARBON

DEFINITIONS OF QUALIFIER CODES:

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UNK = UNKNOWN COMPOUND: Library search result unreasonable or of very low matching quality.

TOT = TOTAL CONCENTRATION REPORTED: Represents the sum of several compounds detected all belonging to the same chemical class.

ISO = OR ISOMER: Compound identification is not selective for this isomer only. This result may instead report the presence of a similar compound comprised of the same atoms bonded together in a different arrangement or substitution pattern.

HC = hydrocarbon

mix = mixture of coeluting compounds

SAMPLE DATA SUMMARY: ORGANIC TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE ID	SAMPLE NUMBER	ANALYSIS FRACTION (VOA/BNA)	ESTIMATED CONCENTRATION VALUE	ESTIMATED CONCENTRATION UNITS	QUALIFIER CODE	COMPOUND NAME
Sub-9	CDR93	VOA				None detected
		BNA	3000	ug/kg	ISO	BENZO(B) TRIPHENYLENE ($C_{22}H_{14}$) CAS# 215-58-7
			23100		TOT(3) ISO	BENZO(J) FLUORANTHENE ($C_{20}H_{12}$) CAS# 205-82-3
			6800		ISO	3-METHYL-CHRYSENE ($C_{19}H_{14}$) CAS# 3351-31-3
			9800		ISO	BENZO(C) PHENANTHRENE ($C_{18}H_{12}$) CAS# 195-19-7
			7600		ISO	BENZO(g,h,i) FLUORANTHENE ($C_{18}H_{10}$) CAS# 203-12-3
			17,800		TOT(3) ISO	BENZO(A) FLUORENE ($C_{17}H_{12}$) CAS# 238-84-6
			5,300			7H-BENZ(D,E) ANTHRACEN-7-ONE ($C_{17}H_{10}O$) CAS# 82-05-3
			4,200		ISO	BENZO(B) NAPHTHO(1,2,D)-THIOPHENE ($C_{16}H_{10}S$) CAS# 205-43-6
			9,500		TOT(2) ISO	1-METHYL-ANTHRACENE ($C_{15}H_{12}$) CAS# 610-48-0
			2,300			[1,1'-BIPHENYL]-2-CARBOXAMIDE ($C_{13}H_{11}NO$)
						CAS# 13234-79-2
			5,300		ISO	5H-INDENO(1,2,B)-PYRIDINE ($C_{12}H_9N$) CAS# 244-99-5
			3,400			DIBENZO THIOPHENE ($C_{12}H_8S$) CAS# 132-65-0
			11,000		UNK	UNKNOWN PAH, MOLECULAR WEIGHT 242
			4,500		UNK	UNKNOWN PAH, MOLECULAR WEIGHT 232
			7,600		UNK	UNKNOWN PAH, PROBABLY OXYGEN AND
						NITROGEN CONTAINING
SD-1	CDR94	VOA	16	mg/kg		SATURATED HC
			10		UNK	UNSATURATED HC
			8.6		UNK	UNKNOWN
		BNA	13,000			OCTAHYDRO-HEXAMETHYL-TRANS-1H-INDENE ($C_{15}H_{28}$)
						CAS # 54832-83-6
			484,700		TOT(18)	SATURATED HC
			3,900		UNK	UNSATURATED, CYCLIC HC

DEFINITIONS OF QUALIFIER CODES:

PAH = polycyclic aromatic hydrocarbon

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TOT = TOTAL CONCENTRATION REPORTED: Represents the sum of several compounds detected all belonging to the same chemical class.

ISO = OR ISOMER: Compound identification is not selective for this isomer only. This result may indicate the presence of a similar compound comprised of the same atoms bonded together in a different arrangement or substitution pattern.

HC = hydrocarbon

mix = mixture of coeluting compounds

SAMPLE DATA SUMMARY: ORGANIC TENTATIVELY IDENTIFIED COMPOUNDS

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SAMPLE NUMBER (Ample ID)	ANALYSIS FRACTION (VOA/BNA)	ESTIMATED CONCENTRATION VALUE	ESTIMATED CONCENTRATION UNITS	QUALIFIER CODE	COMPOUND NAME
S-Back CDR95	VOA				None detected
↓	BNA				None detected
SD-10 (dup SD-1) CDR98	VOA	64	ug/kg	TOT(2)	SATURATED HC
		46		TOT(2) UNK	UNSATURATED HC, POSSIBLY OXYGEN CONTAINING
		116		TOT(3) UNK	UNSATURATED HC
	↓	15		UNK	UNKNOWN
	BNA	14,000			OCTAHYDROHEXAMETHYL-TRANS-1H-INDENE
					($C_{15}H_{26}$) CAS# 54832-83-6
		3,600			DECAHYDRO-2-METHYLNAPHTHALENE
					($C_{11}H_{20}$) CAS# 2958-76-1
		8,100			HEXADECANOIC ACID ($C_{16}H_{32}O_2$) CAS# 57-10-3
↓	↓	522,300	↓	TOT(17)	SATURATED HC

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TOT = TOTAL CONCENTRATION REPORTED: Represents the sum of several compounds detected all belonging to the same chemical class.

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HC = hydrocarbon

mix = mixture of coeluting compounds

7.2.2 Inorganic Data: Lab Case 13852

7.2.2.1 Summary

Four aqueous samples and 13 solid samples were analyzed through the EPA CLP for total metals and cyanide. The sample set included an aqueous field blank and duplicate pairs for the solid and aqueous matrices. The sample set primarily consisted of subsurface soil samples.

The data have been fully reviewed to determine the usability of results according to the National and Regional Guidelines (areas examined in detail are listed in the Support Documentation appendix). Moderately high levels of lead were detected in most samples, and two of these results have been flagged biased low. Low spike recoveries indicate that some results for other elements should also be considered biased low due to digestion losses and some results should be considered estimated due to sample inhomogeneity or matrix interference effects. Imprecision in the inductively coupled plasma (ICP) serial dilution indicates that some results for one element should also be considered estimated. Blank contamination affected results for four elements.

7.2.2.2 Qualifiers

- A number of results have been flagged as undetected because of blank contamination (B). The levels of these elements are not significantly higher in the specified samples than their concentrations in the associated blanks. The following table lists the samples affected by the blank contamination:

ORIGINAL (Red)

Element	Data Affected
chromium	AQ-2 (sample MCCD01)
potassium	Sub-1, Sub-10, Sub-2, Sub-4, Sub-5, Sub-8, Sub-9, SD-1, and S-BACK (samples MCCD04, MCCD06, MCCD05, MCCD08, MCCD09, MCCD12, MCCD13, MCCD14, and MCCD15)
selenium	Sub-1, Sub-10, Sub-3, Sub-4, Sub-8, and S-BACK (samples MCCD04, MCCD06, MCCD07, MCCD08, MCCD12, and MCCD15)
thallium	All results except in Sub-3, Sd-1, and Sd-10 (samples MCCD07, MCCD14, and MCCD17)

- Arsenic, cadmium, and silver results in subsurface soil samples have been flagged estimated because the large percent differences between the levels of these elements in the laboratory duplicate analysis performed on Sub-2 (sample MCCD05) indicate appreciable sample inhomogeneity. The affected samples are MCCD04 through MCCD13. The large disagreement in the arsenic, aluminum, and cyanide results for aqueous field duplicate samples MCCD00 and MCCD02 demonstrates that results for these elements in aqueous samples should also be considered estimated. The affected samples are MCCD00 through MCCD02.

- The pre-digestion (matrix) spike recovery for antimony in sample MCCD05 was below control limits. When the laboratory performed a post-digestion spike (PDS) in order to determine whether the low matrix spike recovery had been caused by a sample-specific matrix interference or a digestion loss, the PDS recovery was acceptable, although still slightly low. The data indicate that a digestion loss did occur, although the recovery may also be sightly depressed due to a matrix interference effect. All samples in the digestion batch (all solid samples) should be considered biased low and have been flagged (L) on the data summary to indicate this. Subsurface soil samples may be additionally affected by interference effects.

- The arsenic recovery in the unspiked aliquot of MCCD05 was significantly higher than in the aliquot spiked for the matrix spike, causing the reported matrix spike recovery for arsenic in this sample to be a largely negative number. The major cause of this negative recovery, however, can be attributed to sample inhomogeneity because, if the arsenic level from the laboratory duplicate analysis of MCCD05 is substituted for the arsenic level in the original analysis, the matrix spike recovery becomes 46.3 percent (see below). Arsenic results in subsurface soil samples have been flagged estimated on the data summary.

- In addition to the arsenic inhomogeneity effects (mentioned above), since the arsenic matrix spike recovery is slightly low, even when using the duplicate analysis data, some arsenic may also have been lost in the digestion process. With the magnitude of the inhomogeneity that affected the subsurface soil samples, it is not possible to determine whether there was also a digestion loss taking place that would apply to all solid samples. With the surface soil samples, the over-riding quality control issue is the inhomogeneity effects (described below). As a worst-case approach, sediment samples MCCD14 and MCCD17 and background sample MCCD15 have been flagged (L) on the data summary, but further information should be obtained if it is important to accurately determine the concentrations of arsenic present.

Sample MCCD05 Arsenic Levels

(spike amount = 40.0 ug/l)	Original Analysis	Duplicate Analysis
matrix spike analysis 9.5 ug/l	245 ug/l	73.0 ug/l
percent recovery	-384 percent	46.3 percent

- The selenium matrix spike recovery in sample MCCD05 was below control limits, and the PDS recovery was good. The low matrix spike recovery, however, can be attributed to sample inhomogeneity because, when the selenium result from the laboratory duplicate analysis of MCCD05 is substituted for the original analysis result, the matrix spike recovery improves to 98 percent (see below). Subsurface soil results for selenium that are above the range attributable to blank contamination have been flagged estimated on the data summary.

Sample MCCD05 Selenium Levels

(spike amount = 10.0 ug/l)	Original Analysis	Duplicate Analysis
matrix spike analysis 13.2 ug/l	16.7 ug/l	3.4 ug/l
percent recovery	-35 percent	98.0 percent

- The sodium result has been flagged estimated in S-BACK (sample MCCD15) because there was 109 percent difference between results for the ICP serial dilution. Sodium results were not questioned in other solid samples because the sample log indicates that the matrix of this off-site background sample was different from that of the other samples collected.

- All lead results were reported by the laboratory from the graphite furnace atomic absorbtion (GFAA) analysis; however, lead data are also available from the ICP analysis. Results from the GFAA and ICP lead analyses for all samples showed acceptable agreement. The agreement between the ICP and GFAA analyses was within 10 percent for samples MCCD01, MCCD10, MCCD12, and MCCD14, which strongly supports the accuracy of the quantitation in these samples. As a general rule, the GFAA results were slightly lower. Data were selected for inclusion on the data summary by comparing the ICP and GFAA analyses and taking the higher of the two values. This worst-case approach allows for the strongest effects indicated by the data. A list of the GFAA and ICP results for lead can be found on the Spike Recovery Evaluation form in the Support Documentation appendix.

7.2.2.3 Support Data

The Support Documentation appendix to this report documents the above findings regarding blank analyses, use of the method of standard additions, matrix and post-digestion spikes, duplicate analyses and ICP serial dilutions, two-times contract required detection limit (CRDL) standard, and instrument detection limits. The text of this report has been formatted to address only those issues affecting the application of the data to the subject investigation. (Issues pertaining to laboratory contractual compliance are addressed on a separate summary directed to the laboratory technical project officer.)

Report prepared by Daniel Benedikt
(215) 687-9510

Report reviewed by Roy Cohen
(215) 687-9510

ORIGINAL
(Red)

SECTION 8

8.0 TOXICOLOGICAL EVALUATION

8.1 Summary

Samples obtained from the Crown Central Petroleum site revealed notable subsurface soil contamination. Organic contaminants of concern included benzene, alkylbenzenes, naphthalenes, and polycyclic aromatic hydrocarbons (PAHs). Inorganic contaminants such as arsenic, copper, lead, selenium, and silver were also detected.

Potential exposure to on-site soils appears to be limited by current site conditions. However, if samples Sub-3 and Sub-7 are considered to be accessible and representative of surface soil, it is possible that workers at the facility may come into direct contact with or inadvertently ingest notably contaminated soils. Localized effects such as skin irritation, dermatitis, and phototoxic reactions may occur in sensitive individuals, and inadvertent work place ingestion of soil may result in increased lifetime cancer risks associated with arsenic, benzene, and a limited number of PAHs. It may also be noted that, although groundwater data are not available for the site, the reported soil contaminants may act as a long-term source of groundwater contamination, if environmental conditions favor leaching.

Surface water and sediment samples collected from the two on-site oil/water separator systems revealed many of the same contaminants detected in on-site soils. Although the release of petroleum-related hydrocarbons to the adjacent Patapsco River may adversely impact sensitive aquatic and terrestrial ecosystems, additional study would be required to adequately assess any effects.

8.2 Support Data

8.2.1 Soil Samples

8.2.1.1 Organics

Organic contaminants detected in subsurface soil samples obtained from the Crown Central Petroleum site are characteristic of the refined petroleum products and wastes stored or disposed at the property. However, current site conditions appear to limit the likelihood of exposure via typical routes such as direct contact and inadvertent ingestion. Public access to the site is restricted, reducing the potentially exposed population to workers at the facility. According to site observations, the majority of the property is also either paved or gravel covered, which limits worker contact with on-site soils to occasional excavating operations. (Note that all soil samples from the site are described as subsurface.) In addition, although inhalation of vapors may be an exposure path associated with volatile organic contaminants, the absence of elevated HNU or OVA readings suggests that, if any contaminants are being released from the soil, they are being dispersed or chemically degraded in the air.

Reported organic compounds that may be considered to be constituents of materials and wastes potentially associated with the site include benzene and several of its alkyl derivatives (toluene, ethylbenzene, and xylenes), naphthalenes, and PAHs. Samples Sub-1 and Sub-10, collected from a darkly stained area with a noticeable diesel fuel odor, revealed the highest reported concentrations of benzene (3,700 ug/kg), ethylbenzene (10,000 ug/kg), total xylenes (340,000 ug/kg), and naphthalenes (107,000 ug/kg total concentration). Toluene was detected at its highest concentration (2,300 ug/kg) in sample Sub-2, which is described as darkly stained with a gasoline odor. PAHs were detected at the highest total concentration (183,400 ug/kg) in sample Sub-9, which was obtained approximately two blocks east of the main property from a dike surrounding the additional storage tanks.

Tentatively identified compounds (TICs) included mostly petroleum-related compounds such as alkylbenzenes (up to 2,470,000 ug/kg total concentration), naphthalenes (up to 130,000 ug/kg total concentration), PAHs (up to 121,200 ug/kg total concentration), and unknown hydrocarbons (up to 2,620,000 ug/kg total concentration). The herbicide symazine (6-chloro-N,N'-diethyl-1,3,5-triazine-2,4-diamine) was also detected at concentrations up to 5,400 ug/kg. FIT 3 personnel reported that herbicides were sprayed at several sample locations before and during sample collection.

Health effects potentially associated with direct contact with benzene and alkylbenzenes include skin irritation and, on repeated and prolonged contact, dermatitis.[1] Given the limited exposure potential associated with the site, adverse effects are not anticipated under normal working conditions. However, if soil samples obtained from depths of less than six inches (specifically, samples Sub-3 and Sub-7) are considered to be generally accessible and representative of surface conditions, it is possible that exposure via direct contact and inadvertent ingestion may occur. In the event that workers were to contact contaminated soil, it is unlikely that such contact would result in significant dermal absorption of benzene or alkylbenzenes due to their high evaporation rates.[1]

If ingested, alkylbenzenes and benzene may be toxic to humans. Alkylbenzenes are central nervous system (CNS) depressants that may produce sluggishness, stupor, anesthesia, narcosis, and coma at high concentrations.[1] At the levels reported in samples Sub-3 and Sub-7, however, such effects would not be expected. Even a worst-case work place exposure scenario (which assumes regular assimilation of 100 mg of contaminated soil or dust) would result in estimated daily alkylbenzene intake levels more than five orders of magnitude below recommended risk reference doses (RfDs) of 0.1 mg/kg per day for ethylbenzene, 0.3 mg/kg per day for toluene, and 2 mg/kg per day for total xylenes.[2] (RfDs are protective for noncarcinogenic endpoints of toxicity over a lifetime.)

In repeated doses, benzene is considered to be more toxic than any alkylbenzene due to its affinity for blood-forming tissues and myelotoxic activity.[1] It has been associated with an increased incidence of leukemia in exposed individuals and has also been shown to be fetotoxic and cause embryolethality in experimental animals.[3] Based on the evidence of human carcinogenicity, benzene is regulated as a Group A (known) carcinogen by EPA. Theoretical work place ingestion and assimilation of 100 mg of soil containing 390 ug/kg benzene over a 40-year period may result in an estimated cancer risk of 6.6×10^{-9}.[2] (Note that the highest reported benzene level occurred in a relatively deep and inaccessible soil sample.)

Although an RfD has not been developed for benzene because it is a carcinogen, noncarcinogenic effects are not expected. Based on a No-Observed-Adverse-Effect-Level (NOAEL) of 1 mg/kg per day for rats, reported by Wolf in 1965, an estimated reference dose of 7×10^{-4} may be calculated.[4] This would correspond to an intake of 4.9×10^{-2} mg per day. A worst-case daily intake level associated with a concentration of 390 ug/kg benzene in soil may result in an intake of approximately 1.6×10^{-5} mg per day.

Direct contact with high concentrations of naphthalenes and PAHs may also cause dermatitis and phototoxic reactions in sensitive individuals and should be avoided. (Note that sample Sub-3 revealed a total PAH concentration of 141,480 ug/kg.) Although these compounds are persistent in soil, most naphthalenes and PAHs can be metabolized by higher organisms and would generally not be expected to adversely impact health via inadvertent ingestion.[3] However, a limited number of PAHs have also been classified as Group B2 (probable) human carcinogens based on evidence of carcinogenicity in laboratory animals. The following Group B2 PAHs were detected at their highest surface soil concentrations in sample Sub-3 (in ug/kg): pyrene, 19,000; benz(a)anthracene, 11,000; chrysene, 10,000; benzo(b)fluoranthene, 7,900; benzo(k)fluoranthene, 7,200; benzo(a)pyrene, 7,200; indeno(1,2,3-cd)pyrene, 2,900; dibenz(a,h)anthracene, 880; and benzo(g,h,i)perylene, 2,300.

Theoretical work place exposure to these Group B2 PAH concentrations may result in an estimated cumulative cancer risk of 9×10^{-5}. This estimation was calculated using a comparative potency approach based on a potency factor of 11.5 for benzo(a)pyrene.[5] Although this potency factor has been withdrawn from EPA's Integrated Risk Information System (IRIS) database, a cancer risk has been included in the evaluation to ensure that all risks are assessed in accordance with EPA Region III policy. However, it is generally recognized that interactions among PAHs in a mixture may moderate the toxicity of individual compounds. Therefore, estimates of carcinogenic risk based on the potency of a limited number of components of a mixture may be overly conservative.[6]

In addition to petroleum-related compounds, Aroclor 1254 was tentatively identified at a concentration of 120 ug/kg. Although PCBs are classified as Group B2 (probable) human carcinogens, exposure potential via dermal contact or inadvertent ingestion is limited by the low level reported and the sample depth (eight inches).

8.2.1.2 Inorganics

Inorganic analysis of on-site soil samples revealed the presence of antimony (up to 21.6 mg/kg), arsenic (up to 759 mg/kg), copper (up to 11,000 mg/kg), lead (up to 3,620 mg/kg), selenium (up to 62.2 mg/kg), and silver (up to 31.4 mg/kg) at concentrations in excess of upper range values typically observed in unpolluted soils. Reference levels for the metals of concern are as follows (in mg/kg): antimony, 8.8; arsenic, 73; copper, 700; lead, 300; selenium, 3.9; and silver, 5.[7,8] It is reported that, in the late 1800s, ore and slag from a copper and steel works were disposed at the subject site. This may account for elevated levels of some or all of the reported metals. However, lead is also a common contaminant associated with gasoline.

With the exception of exposure via inhalation of vapors, exposure scenarios potentially associated with metals in soil will be similar to those associated with organic contaminants. As would be expected, exposure will generally be limited by previously discussed site conditions. However, if samples Sub-3 and Sub-7 (collected from depths of less than six inches) are again considered to be representative of surface soils, dermal contact and inadvertent ingestion may occur. As with the reported organic contaminants, dermal contact with the metals concentrations in samples Sub-3 and Sub-7 is not expected to adversely impact human health in and of itself. For most metals, absorption across intact skin is not considered to be significant, especially from a soil matrix.

Theoretical work place exposure via inadvertent ingestion and assimilation of 100 mg of soil containing the highest metals concentrations reported in either Sub-3 or Sub-7 would not be expected to result in adverse noncarcinogenic effects associated with antimony, arsenic, selenium, silver, and copper. Estimated daily intake levels for a working population for these metals would not exceed their respective RfDs of 1×10^{-3} mg/kg per day for arsenic, 4×10^{-4} mg/kg per day for antimony, 3×10^{-3} mg/kg per day for selenium, 3×10^{-3} mg/kg per day for silver, and 3.7 mg/kg per day for copper. (Note that the RfD for copper was calculated using the RfD of 1.3 mg/l for copper in drinking water and assuming that a 70-kilogram adult consumes 2 liters of water per day.)[2]

While no noncarcinogenic effects would be expected for arsenic, note that chronic exposure to high levels of arsenic in drinking water has been associated with a characteristic pattern of skin disorders, beginning with hyperpigmentation and keratosis and developing in some cases into carcinoma.[9] Based in part on this evidence, arsenic is classified as a Group A (known) human carcinogen, and a unit cancer risk of 5 X 10^{-5} ug/l for drinking water is being considered by EPA.[2] However, the applicability of this unit cancer risk to other exposure scenarios may be questionable. Therefore, while theoretical work place assimilation of 100 mg of soil containing 759 mg/kg arsenic may result in an increased lifetime cancer risk, an estimation cannot be provided. The number of assumptions inherent in a quantitation of risk from soil would severely diminish the usefulness of the derived number. Note also that ingestion of relatively high levels of arsenic in drinking water was required to elicit a carcinogenic response; low levels (10 to 50 ug per day) of arsenic in the diet may be nutritionally beneficial.[10]

In the case of lead, due to neurotoxic and developmental effects associated with the ingestion of lead-contaminated substances, no exposure is desirable. Therefore, no RfD has been established. Theoretical work place assimilation of 100 mg of soil containing 3,460 mg/kg of lead may result in a daily intake level of approximately 0.14 mg per day. While such an intake is not expected to result in overt health effects, this evaluation does not account for any baseline lead intake or factors that may increase the amount of lead ingested or assimilated (age, smoking, drinking, etc.).[11]

Lead has also been classified as a Group B2 (probable) human carcinogen. However, EPA has not developed a consensus potency factor for lead and it is recommended that estimates of carcinogenic risk not be included in toxicological assessments because of the large degree of uncertainty associated with the calculations. In addition, at low levels of lead exposure, the aforementioned neurotoxic and developmental effects are generally of more immediate concern.[12]

8.2.2 Surface Water and Sediment Samples

Surface water and sediment samples collected from the two NPDES-permitted oil/water separators systems also revealed elevated levels of many of the contaminants detected in on-site solid samples. Environmental concerns may arise if high levels of the refined petroleum products stored and disposed at the site are discharged to the adjacent Patapsco River (Baltimore's Inner Harbor). The Patapsco River is used commercially and recreationally for fishing, and one endangered species, the peregrine falcon, has nesting territories within the project study area.

ORIGINAL (Red)

8.2.2.1 Organics

Organic contaminants detected in surface water samples included benzene (up to 2,700 ug/l), toluene (up to 4,600 ug/l), ethylbenzene (up to 52 ug/l), xylenes (up to 1,500 ug/l total concentration), and phenols (up to 448 ug/l total concentration). Although these contaminants are not persistent in surface water and individual concentrations do not exceed Ambient Water Quality Criteria (AWQCs) acute toxicity levels for freshwater organisms, it is possible that a mixture of petroleum-related hydrocarbons may adversely impact aquatic organisms.[13,14] Sublethal levels of some hydrocarbon fractions in surface waters may result in aesthetic tainting of edible fish, rendering them unfit for human consumption. Benthic organisms are also sensitive to low levels of soluble petroleum products (as low as 10 ppb), and some aquatic species may bioconcentrate petroleum hydrocarbons.[14] In addition, sediment samples contained up to 1,500 ug/kg of Aroclor 1254, which is also known to be highly bioaccumulative in the food chain. While further study would be required to determine what effect, if any, the subject site may have on the Patapsco River, it may be noted that the role of dilution may lessen contaminant concentration within the Inner Harbor. Also, because the river receives water from a highly industrialized area, it may be difficult to attribute any adverse effects solely to the Crown Central Petroleum site.

8.2.2.2 Inorganics

Surface water samples also contained aluminum (up to 1,950 ug/l), arsenic (up to 140 ug/l), chromium (up to 25,8 ug/l), copper (up to 360 ug/l), iron (up to 6,180 ug/l), lead (up to 487 ug/l), zinc (up to 371 ug/l), and cyanide (up to 72.3 ug/l). AWQCs for the inorganic contaminants of concern are as follows (in ug/l): aluminum, 87; arsenic, 48; chromium, 11; copper, 12; iron, 1000; lead, 3.2; zinc, 110, and cyanide, 5.2. Note that the criteria for copper, lead, and zinc are hardness dependent and that those for arsenic and chromium are the most conservative criteria for these metals.[13,15,16]

Elevated levels of metals in surface water may adversely impact aquatic organisms. However, most metals will tend to be particulate bound and will accumulate to their greatest concentrations in sediment. Because surface water samples are not field filtered, sediment collected with the samples may artificially elevate surface water metals levels. Note that sediment samples also revealed elevated levels of arsenic, copper, lead, and selenium.

The pH of surface water sample AQ-2 (4.1), obtained from the stand pipe of the northernmost separator, was also outside the AWQC-recommended range of 6.5 to 9. The pH of the discharge for the southernmost separator (6.5), however, was within this range.[13] The acidic condition of sample AQ-2 is not expected to have adverse environmental effects, although it may account for increased solubility and elevated metals concentrations.

8.2.3 Potential Groundwater Concerns

Although there are no monitoring wells on site and groundwater data are not available for the Crown Central Petroleum property, it is possible that contaminants detected in on-site soils may act as a long-term source of groundwater contamination. Current conditions do not indicate that groundwater is used as a source of potable water. However, the discharge of contaminated groundwater to the harbor may have adverse environmental impacts. Note that groundwater data from the neighboring Exxon property indicate that groundwater in the study area is substantially degraded.[17]

Report prepared by Denice Taylor
Denice Taylor, Toxicologist

Report reviewed by William Wentworth for
Elizabeth A. Quinn, Senior Toxicologist

ORIGINAL (Red)

LIST OF SOURCES

1. Clayton, G.D., and F.E. Clayton. 1981. Patty's Industrial Hygiene and Toxicology. Third Revised Edition, Volume 2B. John Wiley & Sons, New York.

2. United States Environmental Protection Agency. Health Effects Assessment Summary Tables; Third Quarter FY90. Office of Emergency and Remedial Response, Washington, D.C.

3. Clement Associates, Incorporated for the United States Environmental Protection Agency. 1985. Chemical, Physical, and Biological Properties of Compounds at Hazardous Waste Sites. Final Report.

4. Oak Ridge National Laboratory for the United States Department of Health and Human Resources. 1987. Toxicological Profile for Benzene. Draft. Agency for Toxic Substances and Disease Registry, Atlanta, Georgia.

5. ICF-Clement Associates for the United States Environmental Protection Agency. 1988. Comparative Potency Approach for Estimating the Cancer Risk Associated with Exposure to Mixtures of Polycyclic Aromatic Hydrocarbons. Interim Final Report.

6. Technical Resources, Incorporated, for United States Department of Health and Human Resources. 1987. Toxicological Profile for Benzo(a)pyrene. Draft. Agency for Toxic Substances and Disease Registry, Atlanta, Georgia.

7. Shacklette, H.T., and J.G. Boerngen. 1984. Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States. United States Geological Survey Professional Paper 1270.

8. Dragun, James. The Soil Chemistry of Hazardous Materials. Hazardous Materials Control Research Institute, Silver Spring, Maryland. 1988.

9. United States Environmental Protection Agency. 1980. Ambient Water Quality Criteria for Arsenic. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C.

ORIGINAL (Red)

10. Technical Resources, Incorporated, for United States Department of Health and Human Resources. 1988. Toxicological Profile for Arsenic. Draft. Agency for Toxic Substances and Disease Registry, Atlanta, Georgia.

11. Technical Resources, Incorporated for United States Department of Health and Human Services. 1988. Toxicological Profile for Lead. Draft. Agency for Toxic Substances and Disease Registry, Atlanta, Georgia.

12. Federal Register. 1988. Drinking Water Regulations; Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Proposed Rule. Volume 53, Number 160. August 18, 1988.

13. United States Environmental Protection Agency. 1986. Quality Criteria for Water. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C. EPA 440/5-86-001.

14. Guthrie, F.E., and J.J. Perry, Editors. 1980. Introduction to Environmental Toxicology. Elsevier North Holland, Incorporated, New York.

15. United States Environmental Protection Agency. 1988. Ambient Aquatic Life Water Quality Criteria for Aluminum. Office of Research and Development, Duluth, Minnesota.

16. United States Environmental Protection Agency. 1987. Update Number 2 to Quality Criteria for Water 1986. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C.

17. Preliminary Assessment of Crown Central Petroleum Corporation. Final Report. Maryland Waste Management Administration, Baltimore, Maryland. August 1984.

APPENDIX A

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00228

CDR80

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR80

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 56506EK9

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ Date Analyzed: 04/13/90

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	15	
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	23	
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	3	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	4	J
100-42-5	Styrene	5	U
1330-20-7	Xylenes (Total)	62	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Ise 306, 351, 520 ORIGINAL

EPA SAMPLE NO.

00229

CDR80

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR80

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 56506EK9

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ Date Analyzed: 04/13/90

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN Oxygen cont. unknown	7.80	23 20	J
2. 96-37-7	METHYLCYCLOPENTANE C_6H_{12}	9.44	283 7.0	J
3. 611-14-3	METHYLETHYLBENZENE ISOMER C_9H_{12} 1-ethyl-2-methyl-benzene (iso)	20.90	627 30	J

Unsat HC
7

~~ethyl~~ methylethyl benzene (C_9H_{12})
611-14-3
30 iso

methylcyclopentane
C_6H_{12}
96-37-7
7 iso

Oxygen cont unk
20

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00959

CDR80

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR80

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506RE3

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/23/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 05/01/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	2	J
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00960
CDR80

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR80

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506RE3

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/23/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 05/01/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenyl Ether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenyl Ether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F JS e 823, 1035, 1344, 1605

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
~~00961~~
CDR80

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR80

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506RE3

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/23/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 05/01/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

umber TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~UNKNOWN~~ blank	12.17	~~730~~ 8.0	J
2. 5392-82-5	1,4-DICHLORO-2-ISOCYANATO-BE	19.37	1162 42	J
3. 626-43-7	DICHLOROBENZAMINE ISOMER $C_6H_5NCl_2$	21.45	1287 12	J
4.	UNKNOWN aromatic, poss N contam	26.46	1587 260	J

1,4-Dichloro-2-isocyanato benzenamine
$C_7H_4N_2Cl_2O$
42 ISO

3,5-Dichloro benzenamine
$C_6H_5NCl_2$
12 ISO

aromatic poss N contaminant
260

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

02072

CDR80

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR801/2Y

Sample wt/vol: 1000 (g/ml) ML Lab File ID: PG-124-1016

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec.____ dec.____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 05/05/90

GPC Cleanup: (Y/N) N pH:___ Dilution Factor: 2.0

CONCENTRATION UNITS: (ug/L or ug/KG) ug/L

CAS NO.	COMPOUND		Q
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC(Lindane)	0.10	U
76-44-8	Heptachlor	0.10	U
309-00-2	Aldrin	0.10	U
1024-57-3	Heptachlor epoxide	0.10	U
959-98-8	Endosulfan I	0.10	U
60-57-1	Dieldrin	0.20	U
72-55-9	4,4'-DDE	0.20	U
72-20-8	Endrin	0.20	U
33213-65-9	Endosulfan II	0.20	U
72-54-8	4,4'-DDD	0.20	U
1031-07-8	Endosulfan sulfate	0.20	U
50-29-3	4,4'-DDT	1.20	U
72-43-5	Methoxychlor	1.00	U
53494-70-5	Endrin Ketone	0.20	U
5103-71-9	alpha-Chlordane	1.00	U
5103-74-2	gamma-Chlordane	1.00	U
8001-35-2	Toxaphene	2.00	U
12674-11-2	Aroclor-1016	1.00	U
11104-28-2	Aroclor-1221	1.00	U
11141-16-5	Aroclor-1232	1.00	U
53469-21-9	Aroclor-1242	1.00	U
12672-29-6	Aroclor-1248	1.00	U
11097-69-1	Aroclor-1254	2.00	U
11096-82-5	Aroclor-1260	2.00	U

MK 5/12/90

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
~~00250~~
CDR81

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR81

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 56506EK10

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ Date Analyzed: 04/13/90

Column: (pack/cap) CAP Dilution Factor: 33

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	330	U
74-83-9	Bromomethane	330	U
75-01-4	Vinyl Chloride	330	U
75-00-3	Chloroethane	330	U
75-09-2	Methylene Chloride	510	B
67-64-1	Acetone	610	
75-15-0	Carbon Disulfide	170	U
75-35-4	1,1-Dichloroethene	170	U
75-34-3	1,1-Dichloroethane	170	U
540-59-0	1,2-Dichloroethene (total)	170	U
67-66-3	Chloroform	170	U
107-06-2	1,2-Dichloroethane	170	U
78-93-3	2-Butanone	330	U
71-55-6	1,1,1-Trichloroethane	170	U
56-23-5	Carbon Tetrachloride	170	U
108-05-4	Vinyl Acetate	330	U
75-27-4	Bromodichloromethane	170	U
78-87-5	1,2-Dichloropropane	170	U
10061-01-5	cis-1,3-Dichloropropene	170	U
79-01-6	Trichloroethene	170	U
124-48-1	Dibromochloromethane	170	U
79-00-5	1,1,2-Trichloroethane	170	U
71-43-2	Benzene	2700	
10061-02-6	trans-1,3-Dichloropropene	170	U
75-25-2	Bromoform	170	U
108-10-1	4-Methyl-2-Pentanone	330	U
591-78-6	2-Hexanone	330	U
127-18-4	Tetrachloroethene	170	U
79-34-5	1,1,2,2-Tetrachloroethane	170	U
108-88-3	Toluene	4600	
108-90-7	Chlorobenzene	170	U
100-41-4	Ethylbenzene	52	J
100-42-5	Styrene	170	U
1330-20-7	Xylenes (Total)	1500	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

I se 306, 351, 920

EPA SAMPLE NO.

00251

CDR81

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR81

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 56506EK10

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ Date Analyzed: 04/13/90

Column (pack/cap) CAP Dilution Factor: 33

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 1634-04-4	2-METHOXY-2-METHYLPROPANE $C_5H_{12}O$	7.77	233 3300	J
2. 611-14-3	METHYLETHYLBENZENE ISOMER C_9H_{12} 2-methyl-1-ethylbenzene isc	20.90	627 230	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR81 00978

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR81

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506EI4

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/25/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	440	
111-44-4	bis(2-Chloroethyl)Ether	20	U
95-57-8	2-Chlorophenol	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
100-51-6	Benzyl Alcohol	20	U
95-50-1	1,2-Dichlorobenzene	20	U
95-48-7	2-Methylphenol	20	U
108-60-1	bis(2-Chloroisopropyl)Ether	20	U
106-44-5	4-Methylphenol	20	U
621-64-7	N-Nitroso-di-n-propylamine	20	U
67-72-1	Hexachloroethane	20	U
98-95-3	Nitrobenzene	20	U
78-59-1	Isophorone	20	U
88-75-5	2-Nitrophenol	20	U
105-67-9	2,4-Dimethylphenol	20	U
65-85-0	Benzoic Acid	100	U
111-91-1	bis(2-Chloroethoxy)methane	20	U
120-83-2	2,4-Dichlorophenol	20	U
120-82-1	1,2,4-Trichlorobenzene	20	U
91-20-3	Naphthalene	20	U
106-47-8	4-Chloroaniline	20	U
87-68-3	Hexachlorobutadiene	20	U
59-50-7	4-Chloro-3-methylphenol	20	U
91-57-6	2-Methylnaphthalene	20	U
77-47-4	Hexachlorocyclopentadiene	20	U
88-06-2	2,4,6-Trichlorophenol	20	U
95-95-4	2,4,5-Trichlorophenol	100	U
91-58-7	2-Chloronaphthalene	20	U
88-74-4	2-Nitroaniline	100	U
131-11-3	Dimethylphthalate	20	U
208-96-8	Acenaphthylene	20	U
606-20-2	2,6-Dinitrotoluene	20	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR81 00979

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR81

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506EI4

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/25/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	100	U
83-32-9	Acenaphthene	20	U
51-28-5	2,4-Dinitrophenol	100	U
100-02-7	4-Nitrophenol	100	U
132-64-9	Dibenzofuran	20	U
121-14-2	2,4-Dinitrotoluene	20	U
84-66-2	Diethylphthalate	20	U
7005-72-3	4-Chlorophenyl-phenyl Ether	20	U
86-73-7	Fluorene	20	U
100-01-6	4-Nitroaniline	100	U
534-52-1	4,6-Dinitro-2-methylphenol	100	U
86-30-6	N-Nitrosodiphenylamine (1)	20	U
101-55-3	4-Bromophenyl-phenyl Ether	20	U
118-74-1	Hexachlorobenzene	20	U
87-86-5	Pentachlorophenol	100	U
85-01-8	Phenanthrene	20	U
120-12-7	Anthracene	20	U
84-74-2	Di-n-butylphthalate	20	U
206-44-0	Fluoranthene	20	U
129-00-0	Pyrene	20	U
85-68-7	Butylbenzylphthalate	20	U
91-94-1	3,3'-Dichlorobenzidine	40	U
56-55-3	Benzo(a)anthracene	20	U
218-01-9	Chrysene	20	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	J
117-84-0	Di-n-octylphthalate	20	U
205-99-2	Benzo(b)fluoranthene	20	U
207-08-9	Benzo(k)fluoranthene	20	U
50-32-8	Benzo(a)pyrene	20	U
193-39-5	Indeno(1,2,3-cd)pyrene	20	U
53-70-3	Dibenz(a,h)anthracene	20	U
191-24-2	Benzo(g,h,i)perylene	20	U

(1) - Cannot be separated from Diphenylamine

IS e 693, 914, 1241, 1517, 2026, 2281

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CDR81 00980

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR81

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506EI4

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/25/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 2.0

Number TICs found: 20

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	611-14-3	ETHYLMETHYLBENZENE ISOMER 1-ethyl-2-methyl-benzene C_9H_{12} iso	10.52	637 68	J
2.	"	TRIMETHYLBENZENE ISOMER C_9H_{12} iso	10.65	639 80	J
3.	"	TRIMETHYLBENZENE ISOMER C_9H_{12} iso	11.89	713 120	J
4.	611-15-4	UNKNOWN 1-ethenyl-2-methyl benzene C_9H_{10}	12.17	730 48	J
5.		UNKNOWN HYDROCARBON SHC	15.57	934 56	J
6.		UNKNOWN HYDROCARBON SHC	17.44	1046 52	J
7.		UNKNOWN HYDROCARBON SHC	19.20	1152 92	J
8.		UNKNOWN HYDROCARBON SHC	20.87	1252 84	J
9.		UNKNOWN 1,3,6-Trimethyl naphthalene + coel unk	21.77	1306 28	J
10.		UNKNOWN HYDROCARBON SHC	22.47	1348 120	J
11.		UNKNOWN HYDROCARBON SHC	23.97	1438 120	J
12.		UNKNOWN HYDROCARBON SHC	24.07	1444 110	J
13.	122-34-9	6-CHLORO-N,N'-DIETHYL-1,3,5-triazine-2,4-diamine $C_7H_{12}N_5Cl$	24.65	1479 64	J
14.		UNKNOWN HYDROCARBON SHC	25.41	1524 100	J
15.		UNKNOWN HYDROCARBON SHC	25.56	1533 64	J
16.		UNKNOWN HYDROCARBON SHC	26.77	1606 84	J
17.		UNKNOWN HYDROCARBON unsat HC	27.32	1639 40	J
18.		UNKNOWN HYDROCARBON SHC	28.07	1684 76	J
19.		UNKNOWN HYDROCARBON SHC	29.32	1759 56	J
20.		UNKNOWN unsat HC, poss oxy cpd	29.99	1799 140	J

1-ethyl-2-methyl benzene (C_9H_{12})
68
80
120
268 (3) tot iso

1-ethenyl-2-methyl benzene (C_9H_{10})
48 iso

Sat HC
56
52
92
84
120
120
110
100
64
84
76
56
1014 (12) tot

1,3,6-trimethyl naphthalene ($C_{13}H_{14}$) + coel unknown
28

6-chloro N,N'-DIETHYL-1,3,5-TRIAZINE-2,4-Diamine ($C_7H_{12}N_5Cl$)
64

unsat HC
40 unk

unsat HC, poss oxy cpd
140 unk

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR81 02076

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: ____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR811 8

Sample wt/vol: 1000 (g/ml) ML Lab File ID: PG-127-1035

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 05/05/90

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 5.0

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NO.	COMPOUND		
319-84-6	alpha-BHC	0.25	U
319-85-7	beta-BHC	0.25	U
319-86-8	delta-BHC	0.25	U
58-89-9	gamma-BHC(Lindane)	0.25	U
76-44-8	Heptachlor	0.25	U
309-00-2	Aldrin	0.25	U
1024-57-3	Heptachlor epoxide	0.25	U
959-98-8	Endosulfan I	0.25	U
60-57-1	Dieldrin	0.50	U
72-55-9	4,4'-DDE	0.50	U
72-20-8	Endrin	0.50	U
33213-65-9	Endosulfan II	0.50	U
72-54-8	4,4'-DDD	0.50	U
1031-07-8	Endosulfan sulfate	0.50	U
50-29-3	4,4'-DDT	0.50	U
72-43-5	Methoxychlor	2.50	U
53494-70-5	Endrin Ketone	0.50	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.00	U
11104-28-2	Aroclor-1221	1.00	U
11141-16-5	Aroclor-1232	1.00	U
53469-21-9	Aroclor-1242	1.00	U
12672-29-6	Aroclor-1248	1.00	U
11097-69-1	Aroclor-1254	1.00	U
11096-82-5	Aroclor-1260	1.00	U

MB 5/14/90

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00271

CDR82

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR82

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 56506EK6

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ Date Analyzed: 04/12/90

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	20	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	24	
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	3	J
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	4	J
100-42-5	Styrene	5	U
1330-20-7	Xylenes (Total)	69	

1E

ISe 305,350,519

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

00272

CDR82

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR82

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 56506EK6

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ Date Analyzed: 04/12/90

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 1634-04-4	2-METHOXY-2-METHYLPROPANE	7.73	232 20	J
2. 96-37-7	METHYLCYCLOPENTANE C_6H_{12}	9.40	282 20	J
3. 611-14-3	METHYLETHYLBENZENE ISOMER 1-ethyl-2-methyl (iso)	20.84	625 8.0	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR82 01017

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR82

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506EI3

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/25/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR82 01018

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR82

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506EI3

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/25/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenyl Ether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenyl Ether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F ISe 692, 912, 1238, 1514, 2022, 2275

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CDR82 01019

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR82

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506EI3

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/25/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 6

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~UNKNOWN~~ blank	8.85	531 8.0	BJ
2.	~~UNKNOWN~~ blank	9.90	591 24	J
3.	UNKNOWN HYDROCARBON SHC	24.00	1446 8.0	J
4. 122-34-9	6-CHLORO-N,N'-DIETHYL-1,3,5-	24.82	1489 130	J
5.	UNKNOWN	25.51	1530 16	J
6.	UNKNOWN HYDROCARBON unknown	27.29	1637 10	J

SHC
8
+

6-chloro, N,N'-diethyl-1,3,5-triazine-2,4-diamine $C_7H_{12}N_5Cl$
130

unknown
16
10
26

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR82 02085

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR821/5Y

Sample wt/vol: 1000 (g/ml) ML Lab File ID: PG-121-1035

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 05/04/90

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 5.0

CONCENTRATION UNITS: (ug/L or ug/KG) ug/L

CAS NO.	COMPOUND		Q
319-84-6	alpha-BHC	0.25	U
319-85-7	beta-BHC	0.25	U
319-86-8	delta-BHC	0.25	U
58-89-9	gamma-BHC(Lindane)	0.25	U
76-44-8	Heptachlor	0.25	U
309-00-2	Aldrin	0.25	U
1024-57-3	Heptachlor epoxide	0.25	U
959-98-8	Endosulfan I	0.25	U
60-57-1	Dieldrin	0.50	U
72-55-9	4,4'-DDE	0.50	U
72-20-8	Endrin	0.50	U
33213-65-9	Endosulfan II	0.50	U
72-54-8	4,4'-DDD	0.50	U
1031-07-8	Endosulfan sulfate	0.50	U
50-29-3	4,4'-DDT	0.50	U
72-43-5	Methoxychlor	2.50	U
53494-70-5	Endrin Ketone	0.50	U
5103-71-9	alpha-Chlordane	2.50	U
5103-74-2	gamma-Chlordane	2.50	U
8001-35-2	Toxaphene	5.00	U
12674-11-2	Aroclor-1016	2.50	U
11104-28-2	Aroclor-1221	2.50	U
11141-16-5	Aroclor-1232	2.50	U
53469-21-9	Aroclor-1242	2.50	U
12672-29-6	Aroclor-1248	2.50	U
11097-69-1	Aroclor-1254	5.00	U
11096-82-5	Aroclor-1260	5.00	U

MJS 5/11/90

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR83 00292

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR83

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 56506EK4

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ Date Analyzed: 04/12/90

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	BJ
67-64-1	Acetone	6	BJ
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylenes (Total)	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CDR83 00293

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR83

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 56506EK4

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. Date Analyzed: 04/12/90

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

01036

CDR83

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR83

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506EJ13

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/23/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR83 01037

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR83

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506EJ13

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/23/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenyl Ether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenyl Ether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CDR83 01038

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) WATER Lab Sample ID: CDR83

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 56506EJ13

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. _____ dec. _____ Date Extracted: 04/16/90

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/23/90

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALKYL HALIDE	11.12	30	BJ

ORIGINAL

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDRB3 02089

Lab Name: IT CERRITOS Contract: 68-D0-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CD-BB

Matrix: (soil/water) WATER Lab Sample ID: CDRB3

Sample wt/vol: 1000 (g/ml) ML Lab File ID: PB-121-1034

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. _____ dec. _____ Date Extracted: 04/16/90

Extraction: (Sept/Cont/Sonc) CONT Date Analyzed: 05/03/90

GPC Cleanup: (Y/N) N pH: ___ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/KG) ug/L	Q
319-84-6	alpha-BHC	0.05	U
319-85-7	beta-BHC	0.05	U
319-86-8	delta-BHC	0.05	U
58-89-9	gamma-BHC(Lindane)	0.05	U
76-44-8	Heptachlor	0.05	U
309-00-2	Aldrin	0.05	U
1024-57-3	Heptachlor epoxide	0.05	U
959-98-8	Endosulfan I	0.05	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin Ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.00	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.00	U
11096-82-5	Aroclor-1260	1.00	U

FORM I PEST 1/87 REV.

MMS 5/11/90

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
0303
CDR84

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR84

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 56507EK12

Level: (low/med) MED Date Received: 04/12/90

% Moisture: not dec. 17 Date Analyzed: 04/19/90

Column: (pack/cap) CAP Dilution Factor: 10

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	15000	U
74-83-9	Bromomethane	15000	U
75-01-4	Vinyl Chloride	15000	U
75-00-3	Chloroethane	15000	U
75-09-2	Methylene Chloride	9800	B
67-64-1	Acetone	40000	B
75-15-0	Carbon Disulfide	7500	U
75-35-4	1,1-Dichloroethene	7500	U
75-34-3	1,1-Dichloroethane	7500	U
540-59-0	1,2-Dichloroethene (total)	7500	U
67-66-3	Chloroform	7500	U
107-06-2	1,2-Dichloroethane	7500	U
78-93-3	2-Butanone	15000	U
71-55-6	1,1,1-Trichloroethane	7500	U
56-23-5	Carbon Tetrachloride	7500	U
108-05-4	Vinyl Acetate	15000	U
75-27-4	Bromodichloromethane	7500	U
78-87-5	1,2-Dichloropropane	7500	U
10061-01-5	cis-1,3-Dichloropropene	7500	U
79-01-6	Trichloroethene	7500	U
124-48-1	Dibromochloromethane	7500	U
79-00-5	1,1,2-Trichloroethane	7500	U
71-43-2	Benzene	2700	J
10061-02-6	trans-1,3-Dichloropropene	7500	U
75-25-2	Bromoform	7500	U
108-10-1	4-Methyl-2-Pentanone	15000	U
591-78-6	2-Hexanone	15000	U
127-18-4	Tetrachloroethene	7500	U
79-34-5	1,1,2,2-Tetrachloroethane	7500	U
108-88-3	Toluene	7500	U
108-90-7	Chlorobenzene	7500	U
100-41-4	Ethylbenzene	7500	U
100-42-5	Styrene	7500	U
1330-20-7	Xylenes (Total)	270000	

1E JS e 308, 354, 524

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CDR84 00304

Lab Name: IT CERRITOS **Contract:** 68-W8-0068

Lab Code: IT **Case No.:** 13852 **SAS No.:** _____ **SDG No.:** CDR80

Matrix: (soil/water) SOIL **Lab Sample ID:** CDR84

Sample wt/vol: 4.0 (g/mL) G **Lab File ID:** 56507EK12

Level: (low/med) MED **Date Received:** 04/12/90

% Moisture: not dec. 17 **Date Analyzed:** 04/19/90

Column (pack/cap) CAP **Dilution Factor:** 10

Number TICs found: 10

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 51677-41-9	2-AZIDO-2,3,3-TRIMETHYLBUTAN $C_7H_{15}N_3$	10.80	324 30000	J
2. 19411-65-5	O-(2-METHYLBUTYL)-HYDROXYLAM $C_5H_{13}NO$	12.90	387 150000	J
3. 1609-26-7	3-ETHYL-2-METHYL-PENTANE SHC	13.20	396 150000	J
4.	TRIMETHYLHEXANE ISOMER C_9H_{20} SHC	13.57	407 75000	J
5. e.g. 611-14-3	METHYLETHYL BENZENE ISOMER C_9H_{12}	21.04	631 150000	J
6. "	TRIMETHYL BENZENE ISOMER C_9H_{12}	21.20	636 120000	J
7. "	METHYLETHYL BENZENE ISOMER C_9H_{12}	22.07	662 120000	J
8. "	TRIMETHYL BENZENE ISOMER C_9H_{12}	22.57	677 300000	J
9.	DIMETHYL BENZENE ISOMER $C_{10}H_{14}$	25.61	768 140000	J
10. 25340-17-4	DIETHYL-BENZENE $C_{10}H_{14}$	25.21	756 110000	J
108-08-7	2,4-dimethyl pentane	8.56	265 10700	J

2-azido-2,3,3-trimethylbutane
$C_7H_{15}N_3$
51677-41-9
30,000

SHC
150,000
75,000
225,000 (2)
10700
235700 (3)

1-ethyl-2-methyl benzene
C_9H_{12}
150,000 iso
120,000
120,000
300,000
690,000 (4)

~~1,2,4-trimethyl benzene~~
4-ethyl-1,2-dimethyl ~~Pene~~ Benzene
$C_{10}H_{14}$
140,000 iso
110,000
250,000 (2) iso

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR84 01051

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR84

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL9

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 17 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/20/90

GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	40000	U
111-44-4	bis(2-Chloroethyl)Ether	40000	U
95-57-8	2-Chlorophenol	40000	U
541-73-1	1,3-Dichlorobenzene	40000	U
106-46-7	1,4-Dichlorobenzene	40000	U
100-51-6	Benzyl Alcohol	40000	U
95-50-1	1,2-Dichlorobenzene	40000	U
95-48-7	2-Methylphenol	40000	U
108-60-1	bis(2-Chloroisopropyl)Ether	40000	U
106-44-5	4-Methylphenol	40000	U
621-64-7	N-Nitroso-di-n-propylamine	40000	U
67-72-1	Hexachloroethane	40000	U
98-95-3	Nitrobenzene	40000	U
78-59-1	Isophorone	40000	U
88-75-5	2-Nitrophenol	40000	U
105-67-9	2,4-Dimethylphenol	40000	U
65-85-0	Benzoic Acid	190000	U
111-91-1	bis(2-Chloroethoxy)methane	40000	U
120-83-2	2,4-Dichlorophenol	40000	U
120-82-1	1,2,4-Trichlorobenzene	40000	U
91-20-3	Naphthalene	24000	J
106-47-8	4-Chloroaniline	40000	U
87-68-3	Hexachlorobutadiene	40000	U
59-50-7	4-Chloro-3-methylphenol	40000	U
91-57-6	2-Methylnaphthalene	83000	
77-47-4	Hexachlorocyclopentadiene	40000	U
88-06-2	2,4,6-Trichlorophenol	40000	U
95-95-4	2,4,5-Trichlorophenol	190000	U
91-58-7	2-Chloronaphthalene	40000	U
88-74-4	2-Nitroaniline	190000	U
131-11-3	Dimethylphthalate	40000	U
208-96-8	Acenaphthylene	40000	U
606-20-2	2,6-Dinitrotoluene	40000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

01052

CDR84

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR84

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL9

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 17 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/20/90

GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	190000	U
83-32-9	Acenaphthene	40000	U
51-28-5	2,4-Dinitrophenol	190000	U
100-02-7	4-Nitrophenol	190000	U
132-64-9	Dibenzofuran	40000	U
121-14-2	2,4-Dinitrotoluene	40000	U
84-66-2	Diethylphthalate	40000	U
7005-72-3	4-Chlorophenyl-phenyl Ether	40000	U
86-73-7	Fluorene	20000	J
100-01-6	4-Nitroaniline	190000	U
534-52-1	4,6-Dinitro-2-methylphenol	190000	U
86-30-6	N-Nitrosodiphenylamine (1)	40000	U
101-55-3	4-Bromophenyl-phenyl Ether	40000	U
118-74-1	Hexachlorobenzene	40000	U
87-86-5	Pentachlorophenol	190000	U
85-01-8	Phenanthrene	41000	
120-12-7	Anthracene	40000	U
84-74-2	Di-n-butylphthalate	40000	U
206-44-0	Fluoranthene	5300	J
129-00-0	Pyrene	9500	J
85-68-7	Butylbenzylphthalate	40000	U
91-94-1	3,3'-Dichlorobenzidine	80000	U
56-55-3	Benzo(a)anthracene	40000	U
218-01-9	Chrysene	4100	J
117-81-7	bis(2-Ethylhexyl)phthalate	40000	U
117-84-0	Di-n-octylphthalate	40000	U
205-99-2	Benzo(b)fluoranthene	40000	U
207-08-9	Benzo(k)fluoranthene	40000	U
50-32-8	Benzo(a)pyrene	40000	U
193-39-5	Indeno(1,2,3-cd)pyrene	40000	U
53-70-3	Dibenz(a,h)anthracene	40000	U
191-24-2	Benzo(g,h,i)perylene	40000	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CDR84 01053

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR84

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL9

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 17 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/20/90

GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 100

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	611-14-3	TRIMETHYLBENZENE ISOMER C_9H_{12}	6.10	541 200000	J
2.	"	ETHYLMETHYLBENZENE ISOMER C_9H_{12}	6.37	565 140000	J
3.	"	TRIMETHYLBENZENE ISOMER C_9H_{12}	6.72	597 340000	J
4.		ETHYLMETHYLBENZENE ISOMER C_9H_{12}	7.42	657 170000	J
5.	611-15-4	UNKNOWN ALKYL BENZENE 1-ethenyl-2-methyl benzene (C_9H_{10})	7.70	683 100000	J
6.		UNKNOWN ALKYL BENZENE 2-ethyl-1,3-dimethyl	8.35	741 130000	J
7.		UNKNOWN ALKYL BENZENE 2-ethyl-1,3-dimethyl $C_{10}H_{14}$	8.95	794 300000	J
8.		UNKNOWN HYDROCARBON SHC	9.39	833 240000	J
9.		TETRAMETHYLBENZENE ISOMER $C_{10}H_{14}$	9.70	862 150000	J
10.	874-35-1	2,3-DIHYDRO-5-METHYL-1H-INDENE $C_{10}H_{12}$	10.32	916 140000	J
11.		UNKNOWN HYDROCARBON SHC	11.49	1019 160000	J
12.		UNKNOWN HYDROCARBON SHC	11.77	1044 400000	J
13.		UNKNOWN HYDROCARBON SHC	12.90	1146 440000	J
14.	90-12-0	1-METHYLNAPHTHALENE $C_{11}H_{10}$	13.45	1194 130000	J
15.		UNKNOWN HYDROCARBON SHC	14.75	1310 390000	J
16.	54832-83-6	1H-INDENE,OCTAHYDRO-2,2,4,4,	15.50	1376 180000	J
17.		UNKNOWN HYDROCARBON SHC	16.19	1437 440000	J
18.		UNKNOWN HYDROCARBON SHC	19.05	1692 360000	J
19.		UNKNOWN HYDROCARBON SHC	19.90	1767 680000	J
20.		UNKNOWN HYDROCARBON SHC	21.30	1892 480000	J
	~~108-08-7~~	~~2,4-Dimethylpentane~~	~~8.1~~	~~268 10700~~	

1-ethyl-3-mesityl benzene C_9H_{12}
200000
140000
340,000
170,000
850,000 (4) ISO

1-ethenyl-2-methyl Benzene (C_9H_{10})
100,000

2-ethyl-1,3-dimethyl Benzene ($C_{10}H_{14}$)
130,000
300,000
150000
580 000 (3) ISO

SHC
210,000
160 000
400,000
440,000
390,000
440,000
360,000
680,000
480,000
3590,000 (9)

2-3,dihydro-4-methyl-1H Indene $C_{10}H_{12}$
146,000 ISO

1-methyl naphthalene not a hit
$C_{11}H_{10}$
130,000

octahydro-hexamethyl 1H-Indene $C_{15}H_{26}$
180,000

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR84 02093

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR841/50Y

Sample wt/vol: 30.0 (g/ml) G Lab File ID: PG-127-1018

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 12 dec. Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 05/07/90

GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 50.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/KG) ug/KG	Q
319-84-6	alpha-BHC	480	U
319-85-7	beta-BHC	480	U
319-86-8	delta-BHC	480	U
58-89-9	gamma-BHC(Lindane)	480	U
76-44-8	Heptachlor	480	U
309-00-2	Aldrin	480	U
1024-57-3	Heptachlor epoxide	480	U
959-98-8	Endosulfan I	480	U
60-57-1	Dieldrin	960	U
72-55-9	4,4'-DDE	960	U
72-20-8	Endrin	960	U
33213-65-9	Endosulfan II	960	U
72-54-8	4,4'-DDD	960	U
1031-07-8	Endosulfan sulfate	960	U
50-29-3	4,4'-DDT	960	U
72-43-5	Methoxychlor	4800	U
53494-70-5	Endrin Ketone	960	U
5103-71-9	alpha-Chlordane	4800	U
5103-74-2	gamma-Chlordane	4800	U
8001-35-2	Toxaphene	9600	U
12674-11-2	Aroclor-1016	4800	U
11104-28-2	Aroclor-1221	4800	U
11141-16-5	Aroclor-1232	4800	U
53469-21-9	Aroclor-1242	4800	U
12672-29-6	Aroclor-1248	4800	U
11097-69-1	Aroclor-1254	9600	U
11096-82-5	Aroclor-1260	9600	U

MB 5/14/90

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ORIGINAL (Red)

CDR85 00335

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR85

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 56507EK14

Level: (low/med) MED Date Received: 04/12/90

% Moisture: not dec. 13 Date Analyzed: 04/19/90

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1400	U
74-83-9	Bromomethane	1400	U
75-01-4	Vinyl Chloride	1400	U
75-00-3	Chloroethane	1400	U
75-09-2	Methylene Chloride	1200	B
67-64-1	Acetone	2900	B
75-15-0	Carbon Disulfide	720	U
75-35-4	1,1-Dichloroethene	720	U
75-34-3	1,1-Dichloroethane	720	U
540-59-0	1,2-Dichloroethene (total)	720	U
67-66-3	Chloroform	720	U
107-06-2	1,2-Dichloroethane	720	U
78-93-3	2-Butanone	1400	U
71-55-6	1,1,1-Trichloroethane	720	U
56-23-5	Carbon Tetrachloride	720	U
108-05-4	Vinyl Acetate	1400	U
75-27-4	Bromodichloromethane	720	U
78-87-5	1,2-Dichloropropane	720	U
10061-01-5	cis-1,3-Dichloropropene	720	U
79-01-6	Trichloroethene	720	U
124-48-1	Dibromochloromethane	720	U
79-00-5	1,1,2-Trichloroethane	720	U
71-43-2	Benzene	1700	
10061-02-6	trans-1,3-Dichloropropene	720	U
75-25-2	Bromoform	720	U
108-10-1	4-Methyl-2-Pentanone	1400	U
591-78-6	2-Hexanone	1400	U
127-18-4	Tetrachloroethene	720	U
79-34-5	1,1,2,2-Tetrachloroethane	720	U
108-88-3	Toluene	2300	
108-90-7	Chlorobenzene	720	U
100-41-4	Ethylbenzene	3200	
100-42-5	Styrene	720	U
1330-20-7	Xylenes (Total)	20000	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

ISe 306, 351, 521

EPA SAMPLE NO.

ORIGINAL

CDR85 00336

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR85

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 56507EK14

Level: (low/med) MED Date Received: 04/12/90

% Moisture: not dec. 13 Date Analyzed: 04/19/90

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	DIMETHYL OCTANE ISOMER SHC	13.07	392 14000	J
2.	TRIMETHYL HEXANE ISOMER SHC	13.37	401 14000	J
3. 921-47-1	2,3,4-TRIMETHYL HEXANE SHC	14.14	424 14000	J
4.	METHYL OCTANE ISOMER SHC	16.04	481 29000	J
5.	UNKNOWN HYDROCARBON SHC	16.30	489 14000	J
6. 611-14-3	ETHYLMETHYL BENZENE ISOMER C_9H_{12}	20.94	628 57000	J
7. "	TRIMETHYL BENZENE ISOMER C_9H_{12} iso	22.47	674 110000	J
8. "	TRIMETHYLBENZENE ISOMER C_9H_{12} iso	24.34	730 43000	J
9. 25340-17-4	DIETHYL BENZENE $C_{10}H_{14}$	25.07	752 57000	J
10.	METHYLETHYL BENZENE ISOMER $C_{10}H_{14}$	25.47	764 57000	J
11	2,3,6-trimethyl heptane ($C_{10}H_{22}$)	15.12	456 2500	J
	oxygen containing unknown	20.00	665 2040	J

SHC
14,000
14,000
14,000
29,000
14,000
85,000 (5) tot
2500
87,500 (6)

1-ethyl-2-methyl benzene C_9H_{12}
611-14-3
57,000 iso
110,000
43,000
210,000 (3) tot iso

diethyl benzene $C_{10}H_{14}$
57,000
57,000 iso
114,000 (2) tot iso

oxygen containing unknown
2040

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ORIGINAL

CDR85 01102

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR85

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL16

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 13 dec. Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/23/90

GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	3800	U
111-44-4	bis(2-Chloroethyl)Ether	3800	U
95-57-8	2-Chlorophenol	3800	U
541-73-1	1,3-Dichlorobenzene	3800	U
106-46-7	1,4-Dichlorobenzene	3800	U
100-51-6	Benzyl Alcohol	3800	U
95-50-1	1,2-Dichlorobenzene	3800	U
95-48-7	2-Methylphenol	3800	U
108-60-1	bis(2-Chloroisopropyl)Ether	3800	U
106-44-5	4-Methylphenol	3800	U
621-64-7	N-Nitroso-di-n-propylamine	3800	U
67-72-1	Hexachloroethane	3800	U
98-95-3	Nitrobenzene	3800	U
78-59-1	Isophorone	3800	U
88-75-5	2-Nitrophenol	3800	U
105-67-9	2,4-Dimethylphenol	3800	U
65-85-0	Benzoic Acid	18000	U
111-91-1	bis(2-Chloroethoxy)methane	3800	U
120-83-2	2,4-Dichlorophenol	3800	U
120-82-1	1,2,4-Trichlorobenzene	3800	U
91-20-3	Naphthalene	7300	
106-47-8	4-Chloroaniline	3800	U
87-68-3	Hexachlorobutadiene	3800	U
59-50-7	4-Chloro-3-methylphenol	3800	U
91-57-6	2-Methylnaphthalene	7300	
77-47-4	Hexachlorocyclopentadiene	3800	U
88-06-2	2,4,6-Trichlorophenol	3800	U
95-95-4	2,4,5-Trichlorophenol	18000	U
91-58-7	2-Chloronaphthalene	3800	U
88-74-4	2-Nitroaniline	18000	U
131-11-3	Dimethylphthalate	3800	U
208-96-8	Acenaphthylene	3800	U
606-20-2	2,6-Dinitrotoluene	3800	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR85

01103

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR85

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL16

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 13 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/23/90

GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	18000	U
83-32-9	Acenaphthene	3800	U
51-28-5	2,4-Dinitrophenol	18000	U
100-02-7	4-Nitrophenol	18000	U
132-64-9	Dibenzofuran	3800	U
121-14-2	2,4-Dinitrotoluene	3800	U
84-66-2	Diethylphthalate	3800	U
7005-72-3	4-Chlorophenyl-phenyl Ether	3800	U
86-73-7	Fluorene	770	J
100-01-6	4-Nitroaniline	18000	U
534-52-1	4,6-Dinitro-2-methylphenol	18000	U
86-30-6	N-Nitrosodiphenylamine (1)	3800	U
101-55-3	4-Bromophenyl-phenyl Ether	3800	U
118-74-1	Hexachlorobenzene	3800	U
87-86-5	Pentachlorophenol	18000	U
85-01-8	Phenanthrene	3800	U
120-12-7	Anthracene	3800	U
84-74-2	Di-n-butylphthalate	3800	U
206-44-0	Fluoranthene	730	J
129-00-0	Pyrene	570	J
85-68-7	Butylbenzylphthalate	3800	U
91-94-1	3,3'-Dichlorobenzidine	7600	U
56-55-3	Benzo(a)anthracene	3800	U
218-01-9	Chrysene	3800	U
117-81-7	bis(2-Ethylhexyl)phthalate	3800	U
117-84-0	Di-n-octylphthalate	3800	U
205-99-2	Benzo(b)fluoranthene	3800	U
207-08-9	Benzo(k)fluoranthene	3800	U
50-32-8	Benzo(a)pyrene	3800	U
193-39-5	Indeno(1,2,3-cd)pyrene	3800	U
53-70-3	Dibenz(a,h)anthracene	3800	U
191-24-2	Benzo(g,h,i)perylene	3800	U

(1) - Cannot be separated from Diphenylamine

1F IS e 628, 968, 1446, 1836, 2552, 2910

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: CDR85

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR85

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL16

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 13 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/23/90

GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 10.0

Number TICs found: 20 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	611-14-3	TRIMETHYLBENZENE ISOMER C_9H_{12}	6.10	541 21000	J
2.	"	TRIEMTHYLBENZENE ISOMER C_9H_{12}	6.75	597 50000	J
3.	"	ETHYLMETHYLBENZENE ISOMER C_9H_{12}	7.42	658 16000	J
4.	611-15-4	UNKNOWN ALKYL BENZENE 1-ethenyl-2-methyl benzene C_9H_{10}	7.70	683 13000	J
5.	207089-4	UNKNOWN ALKYL BENZENE 2-ethyl-1,3-dimethyl $C_{10}H_{14}$	8.15	724 13000	J
6.	2870-4-4	UNKNOWN ALKYL BENZENE $C_{10}H_{14}$	8.34	740 14000	J
7.	"	ALKYL BENZENE $C_{10}H_{14}$	8.94	793 28000	J
8.	"	ALKYL BENZENE $C_{10}H_{14}$	9.37	831 10000	J
9.	"	ALKYL BENZENE $C_{10}H_{14}$	9.70	861 16000	J
10.	874-35-1	DIHYDROMETHY-1H-INDENE ISOME $C_{10}H_{12}$	10.29	913 10000	J
11.		UNKNOWN HYDROCARBON SHC	11.72	1041 11000	J
12.		UNKNOWN HYDROCARBON SHC	12.85	1141 8400	J
13.		UNKNOWN HYDROCARBON SHC	14.69	1304 8400	J
14.	571-61-9	DIMETHYLNAPHTHALENE ISOMER $C_{12}H_{12}$	15.07	1336 4600	J
15.	"	DIMETHYLNAPHTHALENE ISOMER $C_{12}H_{12}$	15.30	1359 2700	J
16.		UNKNOWN HYDROCARBON SHC	16.10	1430 8800	J
17.		UNKNOWN HYDROCARBON SHC	16.70	1483 3400	J
18.		UNKNOWN HYDROCARBON SHC	18.97	1684 5000	J
19.		UNKNOWN HYDROCARBON SHC	19.70	1749 3100	J
20.	122-34-9	6-CHLORO-N,N'-DIETHYL-1,3,5-Triazine-2-4, diamine $C_7H_{12}N_5Cl$	20.27	1800 2300	J

SHC: 1000, 8400, 8400, 800, 400, 5000, 3100 — 41100 (7)

1-ethyl-2-methyl benzene C_9H_{12}: 21,000; 50,000; 16,000 — 87,000 (3)

1-ethenyl-2-methyl benzene C_9H_{10} 611-15-4: 13,000 ISO

2-ethyl-1,3 dimethyl benzene $C_{10}H_{14}$: 13,000; 14,000; 28,000; 10,000; 16,000 — 81,000 (5)

2,3-DIHYDRO-4-METHYL-1H INDENE $C_{10}H_{12}$: 10000 ISO

1,5-DIMETHYL NAPHTHALENE $C_{12}H_{12}$: 4600; 2700 — 7300 (2) tot ISO

6-Chloro-N,N'-Diethyl-1,3,5-Triazine 2,4-Diamine $C_7H_{12}N_5Cl$: 2300

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR85

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR851/5Y

Sample wt/vol: 30.0 (g/ml) G Lab File ID: PG-127-1027

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 13 dec. Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 05/08/90

GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 5.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/KG) ug/KG	Q
319-84-6	alpha-BHC	46	U
319-85-7	beta-BHC	46	U
319-86-8	delta-BHC	46	U
58-89-9	gamma-BHC(Lindane)	46	U
76-44-8	Heptachlor	46	U
309-00-2	Aldrin	46	U
1024-57-3	Heptachlor epoxide	46	U
959-98-8	Endosulfan I	46	U
60-57-1	Dieldrin	92	U
72-55-9	4,4'-DDE	92	U
72-20-8	Endrin	92	U
33213-65-9	Endosulfan II	92	U
72-54-8	4,4'-DDD	92	U
1031-07-8	Endosulfan sulfate	92	U
50-29-3	4,4'-DDT	92	U
72-43-5	Methoxychlor	460	U
53494-70-5	Endrin Ketone	92	U
5103-71-9	alpha-Chlordane	460	U
5103-74-2	gamma-Chlordane	460	U
8001-35-2	Toxaphene	920	U
12674-11-2	Aroclor-1016	460	U
11104-28-2	Aroclor-1221	460	U
11141-16-5	Aroclor-1232	460	U
53469-21-9	Aroclor-1242	460	U
12672-29-6	Aroclor-1248	460	U
11097-69-1	Aroclor-1254	920	U
11096-82-5	Aroclor-1260	920	U

MB 5/14/90

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00370
CDR86

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR86

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 56507EK18

Level: (low/med) MED Date Received: 04/12/90

% Moisture: not dec. 15 Date Analyzed: 04/20/90

Column: (pack/cap) CAP Dilution Factor: 10

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	15000	U
74-83-9	Bromomethane	15000	U
75-01-4	Vinyl Chloride	15000	U
75-00-3	Chloroethane	15000	U
75-09-2	Methylene Chloride	12000	B
67-64-1	Acetone	15000	U
75-15-0	Carbon Disulfide	7400	U
75-35-4	1,1-Dichloroethene	7400	U
75-34-3	1,1-Dichloroethane	7400	U
540-59-0	1,2-Dichloroethene (total)	7400	U
67-66-3	Chloroform	7400	U
107-06-2	1,2-Dichloroethane	7400	U
78-93-3	2-Butanone	15000	U
71-55-6	1,1,1-Trichloroethane	7400	U
56-23-5	Carbon Tetrachloride	7400	U
108-05-4	Vinyl Acetate	15000	U
75-27-4	Bromodichloromethane	7400	U
78-87-5	1,2-Dichloropropane	7400	U
10061-01-5	cis-1,3-Dichloropropene	7400	U
79-01-6	Trichloroethene	7400	U
124-48-1	Dibromochloromethane	7400	U
79-00-5	1,1,2-Trichloroethane	7400	U
71-43-2	Benzene	3700	J
10061-02-6	trans-1,3-Dichloropropene	7400	U
75-25-2	Bromoform	7400	U
108-10-1	4-Methyl-2-Pentanone	15000	U
591-78-6	2-Hexanone	15000	U
127-18-4	Tetrachloroethene	7400	U
79-34-5	1,1,2,2-Tetrachloroethane	7400	U
108-88-3	Toluene	7400	U
108-90-7	Chlorobenzene	7400	U
100-41-4	Ethylbenzene	10000	
100-42-5	Styrene	7400	U
1330-20-7	Xylenes (Total)	340000	

I S e 305, 850, 519

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

00371

CDR86

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR86

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 56507EK18

Level: (low/med) MED Date Received: 04/12/90

% Moisture: not dec. 15 Date Analyzed: 04/20/90

Column (pack/cap) CAP Dilution Factor: 10

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 96-14-0	3-METHYLPENTANE SHC	8.07	242 8800	J
2. 108-08-7	2,4-DIMETHYLPENTANE SHC	8.84	265 15000	J
3. 96-37-7	METHYLCYCLOPENTANE UHC	9.37	281 15000	J
4. 51677-41-9	2-AZIDO-2,3,3-TRIMETHYLBUTANE $C_7H_{15}N_3$	10.67	320 150000	J
5. 20278-87-9	3,3,4-TRIMETHYLHEPTANE SHC	12.80	384 150000	J
6.	UNKNOWN SHC	13.07	392 150000	J
7.	TRIMETHYLHEXANE ISOMER SHC	13.47	404 100000	J
8.	DIMETHYLCYCLOHEXANE ISOMER UnsatHC	14.07	422 29000	J
9.	UNKNOWN unknown ~~UHC~~	15.04	451 29000	J
10.	UNKNOWN unknown	15.97	479 88000	J

SHC
8800
15000
150000
150000
100000
423,800 (5) tot

Unsat HC
15000
29000
44000

2-AZIDO-2,3,3-TRIMETHYL-BUTANE
$C_7H_{15}N_3$
CAS# 51677-4-9
150,000

Unknown
29000
88000
117000 (2) tot unk

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR86 01148

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR86

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL11

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 15 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/21/90

GPC Cleanup: (Y/N) N pH: 8.5 Dilution Factor: 100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	39000	U
111-44-4	bis(2-Chloroethyl)Ether	39000	U
95-57-8	2-Chlorophenol	39000	U
541-73-1	1,3-Dichlorobenzene	39000	U
106-46-7	1,4-Dichlorobenzene	39000	U
100-51-6	Benzyl Alcohol	39000	U
95-50-1	1,2-Dichlorobenzene	39000	U
95-48-7	2-Methylphenol	39000	U
108-60-1	bis(2-Chloroisopropyl)Ether	39000	U
106-44-5	4-Methylphenol	39000	U
621-64-7	N-Nitroso-di-n-propylamine	39000	U
67-72-1	Hexachloroethane	39000	U
98-95-3	Nitrobenzene	39000	U
78-59-1	Isophorone	39000	U
88-75-5	2-Nitrophenol	39000	U
105-67-9	2,4-Dimethylphenol	39000	U
65-85-0	Benzoic Acid	190000	U
111-91-1	bis(2-Chloroethoxy)methane	39000	U
120-83-2	2,4-Dichlorophenol	39000	U
120-82-1	1,2,4-Trichlorobenzene	39000	U
91-20-3	Naphthalene	39000	U
106-47-8	4-Chloroaniline	39000	U
87-68-3	Hexachlorobutadiene	39000	U
59-50-7	4-Chloro-3-methylphenol	39000	U
91-57-6	2-Methylnaphthalene	52000	
77-47-4	Hexachlorocyclopentadiene	39000	U
88-06-2	2,4,6-Trichlorophenol	39000	U
95-95-4	2,4,5-Trichlorophenol	190000	U
91-58-7	2-Chloronaphthalene	39000	U
88-74-4	2-Nitroaniline	190000	U
131-11-3	Dimethylphthalate	39000	U
208-96-8	Acenaphthylene	39000	U
606-20-2	2,6-Dinitrotoluene	39000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR86

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR86

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL11

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 15 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/21/90

GPC Cleanup: (Y/N) N pH: 8.5 Dilution Factor: 100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	190000	U
83-32-9	Acenaphthene	39000	U
51-28-5	2,4-Dinitrophenol	190000	U
100-02-7	4-Nitrophenol	190000	U
132-64-9	Dibenzofuran	39000	U
121-14-2	2,4-Dinitrotoluene	39000	U
84-66-2	Diethylphthalate	39000	U
7005-72-3	4-Chlorophenyl-phenyl Ether	39000	U
86-73-7	Fluorene	39000	U
100-01-6	4-Nitroaniline	190000	U
534-52-1	4,6-Dinitro-2-methylphenol	190000	U
86-30-6	N-Nitrosodiphenylamine (1)	39000	U
101-55-3	4-Bromophenyl-phenyl Ether	39000	U
118-74-1	Hexachlorobenzene	39000	U
87-86-5	Pentachlorophenol	190000	U
85-01-8	Phenanthrene	36000	J
120-12-7	Anthracene	39000	U
84-74-2	Di-n-butylphthalate	39000	U
206-44-0	Fluoranthene	39000	U
129-00-0	Pyrene	8000	J
85-68-7	Butylbenzylphthalate	39000	U
91-94-1	3,3'-Dichlorobenzidine	78000	U
56-55-3	Benzo(a)anthracene	39000	U
218-01-9	Chrysene	39000	U
117-81-7	bis(2-Ethylhexyl)phthalate	39000	U
117-84-0	Di-n-octylphthalate	39000	U
205-99-2	Benzo(b)fluoranthene	39000	U
207-08-9	Benzo(k)fluoranthene	39000	U
50-32-8	Benzo(a)pyrene	39000	U
193-39-5	Indeno(1,2,3-cd)pyrene	39000	U
53-70-3	Dibenz(a,h)anthracene	39000	U
191-24-2	Benzo(g,h,i)perylene	39000	U

(1) - Cannot be separated from Diphenylamine

1F

ISe 627, 969, 1449, 1842, 2553, 2910

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CDR86 01150

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13352 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR86

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL11

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 15 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/21/90

GPC Cleanup: (Y/N) N pH: 8.5 Dilution Factor: 100

Number TICs found: 20

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

Scan

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 611-14-3	ETHYLMETHYLBENZENE ISOMER C_9H_{12}	5.92	526 ISO 160000	J
2. "	TRIMETHYLBENZENE ISOMER C_9H_{12}	6.10	541 ISO 200000	J
3. "	ETHYLMETHYLBENZENE ISOMER C_9H_{12}	6.37	565 ISO 140000	J
4. "	TRIMETHYLBENZENE ISOMER C_9H_{12}	6.72	597 ISO 290000	J
5. "	TRIMETHYLBENZENE ISOMER C_9H_{12}	7.42	658 ISO 150000	J
6. 2870-4-4	UNKNOWN ALKYL BENZENE $C_{10}H_{14}$	8.34	740 ISO 130000	J
7. "	UNKNOWN ALKYL BENZENE $C_{10}H_{14}$	8.79	780 ISO 130000	J
8.	UNKNOWN ALKYL BENZENE $C_{10}H_{14}$	8.94	793 ISO 260000	J
9. ~~2870-4-4~~	UNKNOWN HYDROCARBON SHC	9.37	832 210000	J
10. 2870-4-4	TETRAMETHYLBENZENE ISOMER $C_{10}H_{14}$	9.70	861 ISO 140000	J
11. 4830-99-3	UNKNOWN 1-ethyl-2,3-dihydro-1H Indene $C_{11}H_{14}$	10.30	914 ISO 140000	J
12.	UNKNOWN SHC	11.47	1018 150000	J
13.	UNKNOWN HYDROCARBON SHC	11.75	1044 370000	J
14.	UNKNOWN HYDROCARBON unknown	12.62	1120 120000	J
15.	UNKNOWN HYDROCARBON unsat HC	12.89	1144 380000	J
16.	UNKNOWN HYDROCARBON SHC	14.74	1307 290000	J
17. 571-61-9	DIMETHYLNAPHTHALENE ISOMER (1,5)	15.37	1364 110000	J
18.	UNKNOWN HYDROCARBON SHC	16.17	1435 350000	J
19.	UNKNOWN HYDROCARBON SHC	19.05	1691 320000	J
20.	UNKNOWN HYDROCARBON SHC	19.89	1766 550000	J

1-ethyl-3-methyl benzene C_9H_{12}	2-ethyl-1,3-dimethyl benzene $C_{10}H_{14}$	Saturated HC	1-ethyl-2,3-dihydro-1H Indene ($C_{11}H_{14}$)	unknown	unsat HC
160,000	130,000	210,000	140,000 ISO	120,000 est	380,000 est
200,000	130,000	150,000			
140,000	260,000	370,000			
290,000	140,000	290,000			
150,000		350,000			
940000 (5) tot ISO	660,000 tot (4) ISO	320,000			
		550,000			
		2240000 tot (7)			

1,5-Dimethyl naphthalene $C_{12}H_{12}$

110,000 ISO

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR86 02109

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR861/50Y

Sample wt/vol: 30.0 (g/ml) G Lab File ID: PG-127-1021

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 15 dec. Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 05/08/90

GPC Cleanup: (Y/N) N pH: 8.5 Dilution Factor: 50.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/KG) ug/KG	Q
319-84-6	alpha-BHC	470	U
319-85-7	beta-BHC	470	U
319-86-8	delta-BHC	470	U
58-89-9	gamma-BHC(Lindane)	470	U
76-44-8	Heptachlor	470	U
309-00-2	Aldrin	470	U
1024-57-3	Heptachlor epoxide	470	U
959-98-8	Endosulfan I	470	U
60-57-1	Dieldrin	940	U
72-55-9	4,4'-DDE	940	U
72-20-8	Endrin	940	U
33213-65-9	Endosulfan II	940	U
72-54-8	4,4'-DDD	940	U
1031-07-8	Endosulfan sulfate	940	U
50-29-3	4,4'-DDT	940	U
72-43-5	Methoxychlor	4700	U
53494-70-5	Endrin Ketone	940	U
5103-71-9	alpha-Chlordane	4700	U
5103-74-2	gamma-Chlordane	4700	U
8001-35-2	Toxaphene	9400	U
12674-11-2	Aroclor-1016	4700	U
11104-28-2	Aroclor-1221	4700	U
11141-16-5	Aroclor-1232	4700	U
53469-21-9	Aroclor-1242	4700	U
12672-29-6	Aroclor-1248	4700	U
11097-69-1	Aroclor-1254	9400	U
11096-82-5	Aroclor-1260	9400	U

MB 5/14/90

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00404

CDR87 ORIGINAL (Red)

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR87

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 56507EK17

Level: (low/med) MED Date Received: 04/12/90

% Moisture: not dec. 26 Date Analyzed: 04/20/90

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1700	U
74-83-9	Bromomethane	1700	U
75-01-4	Vinyl Chloride	1700	U
75-00-3	Chloroethane	1700	U
75-09-2	Methylene Chloride	1800	B
67-64-1	Acetone	18000	B
75-15-0	Carbon Disulfide	840	U
75-35-4	1,1-Dichloroethene	840	U
75-34-3	1,1-Dichloroethane	840	U
540-59-0	1,2-Dichloroethene (total)	840	U
67-66-3	Chloroform	840	U
107-06-2	1,2-Dichloroethane	840	U
78-93-3	2-Butanone	1700	U
71-55-6	1,1,1-Trichloroethane	840	U
56-23-5	Carbon Tetrachloride	840	U
108-05-4	Vinyl Acetate	1700	U
75-27-4	Bromodichloromethane	840	U
78-87-5	1,2-Dichloropropane	840	U
10061-01-5	cis-1,3-Dichloropropene	840	U
79-01-6	Trichloroethene	840	U
124-48-1	Dibromochloromethane	840	U
79-00-5	1,1,2-Trichloroethane	840	U
71-43-2	Benzene	390	J
10061-02-6	trans-1,3-Dichloropropene	840	U
75-25-2	Bromoform	840	U
108-10-1	4-Methyl-2-Pentanone	1700	U
591-78-6	2-Hexanone	1700	U
127-18-4	Tetrachloroethene	840	U
79-34-5	1,1,2,2-Tetrachloroethane	840	U
108-88-3	Toluene	300	J
108-90-7	Chlorobenzene	840	U
100-41-4	Ethylbenzene	1500	
100-42-5	Styrene	840	U
1330-20-7	Xylenes (Total)	1500	

1E

ISe 305, 350, 519

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CDR87 00405

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR87

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 56507EK17

Level: (low/med) MED Date Received: 04/12/90

% Moisture: not dec. 26 Date Analyzed: 04/20/90

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 10

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN HYDROCARBON unknown	7.20	216 6200	J
2.		UNKNOWN HYDROCARBON S#C	7.67	230 5600	J
3.	96-37-7	METHYLCYCLOPENTANE VHC	9.37	281 2400	J
4.		UNKNOWN HYDROCARBON S#C	10.67	320 1400	J
5.		UNKNOWN HYDROCARBON VHC	12.44	373 1000	J
6.	560-21-4	2,3,3-TRIMETHYLPENTANE S#C C_8H_{18}	13.04	391 1000	J
7.		UNKNOWN DIMETHYLCYCLOHEXANE VHC C_8H_{16}	14.04	421 1500	J
8.		UNKNOWN HYDROCARBON (C_8H_{16}) VHC	15.94	478 4400	J
9.		UNKNOWN HYDROCARBON (C_8H_{16}) VHC	16.24	487 1900	J
10.		UNKNOWN HYDROCARBON unknown	18.84	565 7100	J
	108-08-7	2,4-dimethyl pentane (probably oxygen cont) (C_7H_{16})	8:50	265 880	

unknown: 6200 unk

S#C: 5600, 1400, 1000 — 8000 (3) sat; 880 — 8880 (4)

Unsat HC: 2400, 1000, 1500, 4400, 1900 — 11200 (5) ~~sat~~ unk

probably oxygen cont unknown: 7100 unk

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR87 01196

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR87

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL17

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 26 dec. Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/23/90

GPC Cleanup: (Y/N) N pH: 7.8 Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	4500	U
111-44-4	bis(2-Chlorcethyl)Ether	4500	U
95-57-8	2-Chlorophenol	4500	U
541-73-1	1,3-Dichlorobenzene	4500	U
106-46-7	1,4-Dichlorobenzene	4500	U
100-51-6	Benzyl Alcohol	4500	U
95-50-1	1,2-Dichlorobenzene	4500	U
95-48-7	2-Methylphenol	4500	U
108-60-1	bis(2-Chloroisopropyl)Ether	4500	U
106-44-5	4-Methylphenol	4500	U
621-64-7	N-Nitroso-di-n-propylamine	4500	U
67-72-1	Hexachloroethane	4500	U
98-95-3	Nitrobenzene	4500	U
78-59-1	Isophorone	4500	U
88-75-5	2-Nitrophenol	4500	U
105-67-9	2,4-Dimethylphenol	4500	U
65-85-0	Benzoic Acid	22000	U
111-91-1	bis(2-Chloroethoxy)methane	4500	U
120-83-2	2,4-Dichlorophenol	4500	U
120-82-1	1,2,4-Trichlorobenzene	4500	U
91-20-3	Naphthalene	2000	J
106-47-8	4-Chloroaniline	4500	U
87-68-3	Hexachlorobutadiene	4500	U
59-50-7	4-Chloro-3-methylphenol	4500	U
91-57-6	2-Methylnaphthalene	4500	
77-47-4	Hexachlorocyclopentadiene	4500	U
88-06-2	2,4,6-Trichlorophenol	4500	U
95-95-4	2,4,5-Trichlorophenol	22000	U
91-58-7	2-Chloronaphthalene	4500	U
88-74-4	2-Nitroaniline	22000	U
131-11-3	Dimethylphthalate	4500	U
208-96-8	Acenaphthylene	4500	U
606-20-2	2,6-Dinitrotoluene	4500	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CDR87 0119

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR87

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL17

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 26 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/23/90

GPC Cleanup: (Y/N) N pH: 7.8 Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	22000	U
83-32-9	Acenaphthene	3400	J
51-28-5	2,4-Dinitrophenol	22000	U
100-02-7	4-Nitrophenol	22000	U
132-64-9	Dibenzofuran	3900	J
121-14-2	2,4-Dinitrotoluene	4500	U
84-66-2	Diethylphthalate	4500	U
7005-72-3	4-Chlorophenyl-phenyl Ether	4500	U
86-73-7	Fluorene	4600	
100-01-6	4-Nitroaniline	22000	U
534-52-1	4,6-Dinitro-2-methylphenol	22000	U
86-30-6	N-Nitrosodiphenylamine (1)	4500	U
101-55-3	4-Bromophenyl-phenyl Ether	4500	U
118-74-1	Hexachlorobenzene	4500	U
87-86-5	Pentachlorophenol	22000	U
85-01-8	Phenanthrene	28000	
120-12-7	Anthracene	5200	
84-74-2	Di-n-butylphthalate	4500	U
206-44-0	Fluoranthene	28000	
129-00-0	Pyrene	19000	
85-68-7	Butylbenzylphthalate	4500	U
91-94-1	3,3'-Dichlorobenzidine	8900	U
56-55-3	Benzo(a)anthracene	11000	
218-01-9	Chrysene	10000	
117-81-7	bis(2-Ethylhexyl)phthalate	4500	U
117-84-0	Di-n-octylphthalate	4500	U
205-99-2	Benzo(b)fluoranthene	7900	
207-08-9	Benzo(k)fluoranthene	7200	
50-32-8	Benzo(a)pyrene	7200	
193-39-5	Indeno(1,2,3-cd)pyrene	2900	J
53-70-3	Dibenz(a,h)anthracene	880	J
191-24-2	Benzo(g,h,i)perylene	2300	J

(1) - Cannot be separated from Diphenylamine

ISC 627, 969, 1449, 1841, 2554, 2912

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CDR87 01198

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix: (soil/water) SOIL Lab Sample ID: CDR87

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 56507EL17

Level: (low/med) LOW Date Received: 04/12/90

% Moisture: not dec. 26 dec. ____ Date Extracted: 04/18/90

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 04/23/90

GPC Cleanup: (Y/N) N pH: 7.8 Dilution Factor: 10.0

Number TICs found: 20

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN HYDROCARBON SHC	7.55	670 9400	J
2.	13151-73-0	2-CYCLOHEXYL-DECANE 2-CYCLOH UHC	7.67	681 5800	J
3.		UNKNOWN HYDROCARBON UHC	7.92	703 5400	J
4.	91-17-8	DECAHYDRONAPHTHALENE ISOMER $C_{10}H_{18}$	8.15	723 4500	J
5.	2870-4-4	ALKYL BENZENE $C_{10}H_{14}$	8.92	792 6800	J
6.		UNKNOWN HYDROCARBON SHC	9.37	831 9400	J
7.	2958-76-1	DECAHYDRO-2-METHYLNAPHTHALENE $C_{11}H_{20}$	9.80	870 5800	J
8.	4830-99-3	ALKYL BENZENE $C_{11}H_{14}$	11.32	1005 7600	J
9.		UNKNOWN HYDROCARBON SHC	11.47	1018 12000	J
10.		UNKNOWN HYDROCARBON SHC	11.75	1043 18000	J
11.		DIHYDRODIMETHYL-1H-INDENE IS $C_{11}H_{14}$	12.34	1095 6800	J
12.		UNKNOWN HYDROCARBON SHC	13.37	1187 9000	J
13.		UNKNOWN HYDROCARBON SHC	14.74	1308 23000	J
14.	571-61-9	DIMETHYLNAPHTHALENE ISOMER $C_{12}H_{12}$	15.12	1342 32000	J
15.		UNKNOWN HYDROCARBON SHC	16.17	1435 30000	J
16.		UNKNOWN HYDROCARBON SHC	18.30	1625 18000	J
17.		UNKNOWN HYDROCARBON SHC	19.04	1690 40000	J
18.		UNKNOWN HYDROCARBON SHC + coel unk	19.77	1755 30000	J
19.		UNKNOWN HYDROCARBON SHC	19.87	1764 63000	J
20.		UNKNOWN HYDROCARBON SHC	21.27	1889 45000	J

Saturated HC: 9400, 9400, ~~[illegible]~~, 12000, 18000, 9000, 23000, 30000, 18000, 40000, 63,000, 45,000 — 276800 Tot (11)

Unsaturated HC: 5800, 5400 — 11200 (2) Tot Unk

decahydronaphthalene $C_{10}H_{18}$: 4500 ISO

2-ETHYL-1,3-DIMETHYL Benzene ($C_{10}H_{14}$): 6800 ISO

decahydro-2-methylnaphthalene $C_{11}H_{20}$: 5800

1-ethyl-2,3-dihydro-1H-indene $C_{11}H_{14}$: 7600, 6800 ISO — 14400 Tot (2) ISO

~~1,3-dimethyl-2,3-dihydro-1H-indene $C_{11}H_{14}$~~

1,5-dimethylnaphthalene $C_{12}H_{12}$: 32000 ISO

SHC + Coel unk: 30,000 Tot Unk

FORM I SV-TIC

1/87 Rev.

ORIGINAL
(Red)

APPENDIX B

PROJECT NAME: CROWN CENTRAL PETROLEUM
TDD NO.: F3-9003-08

EPA SITE NO.: MD 813
REGION: III

SUPPORT DOCUMENTATION FOR THE REVIEW OF ORGANIC ANALYSIS LAB DATA PACKAGE

CASE/SAS NO.: 13852
TYPE OF ANALYSIS: ORGANIC: VOA/BNA/PEST
CONTRACT LABORATORY: IT CERRITOS
APPLICABLE IFB OR SOW: 2/88
REVIEWER: DANIEL O. BENEDIKT
REVIEW DATE:

APPLICABLE SAMPLE NO's.: CDR80 - CDR96, CDR98

THE FOLLOWING TABLE INDICATES AREAS WHICH WERE EXAMINED IN DETAIL, THE IDENTIFIED PROBLEM AREAS, AND SUPPORT DOCUMENTATION ATTACHMENTS:

	AREAS EXAMINED IN DETAIL (CHECK (✓) IF YES OR FOOTNOTE LETTER FOR COMMENTS BELOW)				PROBLEM AREAS IDENTIFIED (CHECK (✓) IF YES OR FOOTNOTE NUMBER FOR COMMENTS BELOW)				SUPPORT DOCUMENTATION ATTACHMENTS (CHECK (✓) IF YES OR IDENTIFY ATTACHMENT NO.)			
	ALL APPLICABLE ANALYSES	VOA	BNA	PEST/PCB	ALL APPLICABLE ANALYSES	VOA	BNA	PEST/PCB	ALL APPLICABLE ANALYSES	VOA	BNA	PEST/PCB
HOLDING TIMES	X											
BLANK ANALYSIS RESULTS: TARGET COMPOUNDS	X					X	X		X			
BLANK ANALYSIS RESULTS: TENTATIVE I.D.s	X					X	X		X			
SURROGATE SPIKE RESULTS	X						X		X			
MATRIX SPIKE RESULTS	X								X			
DUPLICATE ANALYSIS RESULTS	X											
TARGET COMPOUND MATCHING QUALITY	X											
TENTATIVELY IDENTIFIED COMPOUNDs	X											
DFTPP & BFB SPECTRUM TUNE RESULTS	X											
GC INSTRUMENT PERFORMANCE	X											
INITIAL CALIBRATIONS	X											
CONTINUING CALIBRATIONS	X					X			X			
QUANTITATION OF RESULTS	X											
OTHERS												

COMMENTS:

CASE 15552 BLANK ANALYSIS RESULTS FOR TARGET COMPOUNDS

FRACTION	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT)
VOA	LAB	LOW	AQ	VBLK1 4/12/90	LAB	Methylene Chloride (5 ug/l (1))
						Acetone (8 ug/l / 10 ug/l)
						1,1,1-TRICHLOROETHANE (0.12 ug/l (2) / 5 ug/l)
					*	TOLUENE (0.27 ug/l (2) / 5 ug/l)
				VBLK2 4/13/90		METHYLENE CHLORIDE (1.6 ug/l / 5 ug/l)
						TOLUENE (0.15 ug/l (2) / 5 ug/l)
				VBLK3 4/17/90	*	METHYLENE CHLORIDE (1.8 ug/l / 5 ug/l)
					*	ACETONE (5.8 ug/l / 10 ug/l)
					*	1,1,1-TRICHLOROETHANE (3.5 ug/l / 5 ug/l)
				VBLK4 4/18/90		METHYLENE CHLORIDE (6 ug/l / 5 ug/l)
						4-METHYL-2-PENTANONE (0.16 ug/l (2) / 10 ug/l)
						2-HEXANONE (0.49 ug/l (2) / 10 ug/l)
						1,1,2,2-TETRACHLOROETHANE (0.17 ug/l (2) / 5 ug/l)
				↓		ACETONE (1.6 ug/l (2) / 10 ug/l)
				VBLK7 5/8/90		METHYLENE CHLORIDE (2.6 ug/l / 5 ug/l)
						TOLUENE (0.04 ug/l (2) / 5 ug/l)
	FIELD	LOW	AQ	CDR83 4/12/90	NUS	METHYLENE CHLORIDE (1.2 ug/l / 5 ug/l)
						ACETONE (5.7 ug/l / 10 ug/l)
						TOLUENE (0.055 ug/l (2) / 5 ug/l)
				CDR96 4/12/90		METHYLENE CHLORIDE (0.38 ug/l (2) / 5 ug/l)
						ACETONE (4.9 ug/l / 10 ug/l)
BNA	LAB	LOW	AQ	SBLK1 4/20/90	LAB	None detected

LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHIN SAMPLE ANALYTICAL DATA SUMMARY. TENTATIVELY IDENTIFIED COMPOUNDS IN BLANKS ARE LISTED ON A SEPARATE

COMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM QUANTITATION LIST, DIAGNOSTICS, CHROMATOGRAM AND/OR SPECTRA.

* HIGHEST RESULT FOUND IN ANY BLANK - APPLIES TO BOTH LOW-LEVEL AND MEDIUM LEVEL ANALYSES

CASE 13852

BLANK ANALYSIS RESULTS

Pg 2 of 2

TASK	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT)
BNA	LAB	LOW	SOL	SBLK2 4/20/90	LAB	None detected
	LAB	LOW	AQ	SBLK3 4/25/90		None detected
	LAB	LOW	SOL	SBLK4 4/26/90		None detected
	LAB	LOW	AQ	SBLK5 4/30/90	*	BIS (2-ETHYLHEXYL) PHTHALATE (0.54 ug/L) (2)
	FIELD	LOW	AQ	CDR83 4/23/90	NVS	BIS (2-ETHYLHEXYL) PHTHALATE (0.178 ug/L) (2)
PEST	LAB	LOW	AQ	PBLK1 5/3/90	LAB	None detected
	LAB	LOW	SOL	PBLK2 5/5/90		None detected
	LAB	LOW	AQ	PBLK3 5/3/90		None detected
	FIELD	LOW	AQ	CDR83 5/3/90	NVS	None detected

LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM SAMPLE ANALYTICAL DATA SUMMARY.

COMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM RAW DATA

* HIGHEST LEVEL FOUND IN ANY BLANK

2B
SOIL VOLATILE SURROGATE RECOVERY

00199

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Level:(low/med) MED

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	CDR84	97	104	87	0	0
02	CDR85	98	108	94	0	0
03	CDR86	95	105	84	0	0
04	CDR87	94	109	84	0	0
05	CDR85MS	99	111	98	0	0
06	CDR85MSD	100	114	92	0	0
07	VBLK5	100	103	74	0	0
08	VBLK6	98	104	74	0	0

		QC LIMITS
S1 (TOL)	= Toluene-d8	(81-117)
S2 (BFB)	= Bromofluorobenzene	(74-121)
S3 (DCE)	= 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

FORM II VOA-2 1/87 Rev.

BLANK ANALYSIS RESULTS FOR TARGET COMPOUNDS

FRACTION	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT
VOA	LAB/MED/AQ			VBLK5 4/11/90	LAB	METHYLENE CHLORIDE (650 ug/L / 620 ug/L)
						ACETONE (950 ug/L / 1200 ug/L)
						1,1,2,2-TETRACHLOROETHANE (10 ug/L (2) / 620 ug/L)
						TOLUENE (72 ug/L (2) / 620 ug/L)
						ETHYL BENZENE (17 ug/L (2) / 620 ug/L)
						XYLENE (12 ug/L (2) / 620 ug/L)
				VBLK6 4/20/90		METHYLENE CHLORIDE (668 ug/L / 5 ug/L)
						ACETONE (1960 ug/L / 1200 ug/L)
						TOLUENE (61 ug/L (2) / 620 ug/L)
						1,1,1-TRICHLOROETHANE (21 ug/L (2) / 620 ug/L)

LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHIN SAMPLE ANALYTICAL DATA SUMMARY. TENTATIVELY IDENTIFIED COMPOUNDS IN BLANKS ARE LISTED ON A SEPARATE

COMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM QUANTITATION LIST, DIAGNOSTICS, CHROMATOGRAM AND/OR SPECTRA.

BLANK ANALYSIS RESULTS FOR TENTATIVELY IDENTIFIED COMPOUNDS

HSE 13852 - LOW LEVEL

ORIGINAL (Red)

ALL TENTATIVELY IDENTIFIED COMPOUNDS FOUND IN BLANK ANALYSES ARE LISTED BELOW:

SAMPLE #	FRACTION	SCAN ~~#(S)~~ OR R.T	ESTIMATED CONCENTRATION	COMPOUND NAME	COMMENTS
VBLK1	VOA	393	1%	ISE 350	NLS	ISE 305, 350 519
↓		565	<1%	ISE 519	↓	
VBLK2		244	1%	ISE 306		ISE 306
VBLK3		248	1%	ISE 311		ISE 311
VBLK4					None detected
VBLK7		130			ACETONE + FREON COELUTE	ISE 254
↓					- main peaks. 43*, 58, 66, 85, 101**, 103* 151**, 153
CDR83		393	1%	ISE 350	NLS	ISE 305 350 519
CDR96	↓	100	5%	ISE 305	NLS	ISE 305 350 519
SBLK1	BNA	667	16 ug/l		Unknown - main peaks: 38-43*, 55-57	ISE 827 1040 1349 1610 208
		816	8 ug/l		1,1'-OXYBIS(2-ETHANOL) ETHANE - main peaks 403 41, 43-45	
		843	10 ug/l		4-ETHYL-1-OCTYN-3-OL ($C_{10}H_{18}O$) - MAIN PEAKS - 69-70, 72, 75	
		733	5%	ISE 826	NLS 39, 41-43, 55-57*, 58, 69-70, 83, 84, 98	
SBLK2		1801	1%	ISE 1835	NLS	ISE 1835
SBLK3		528	12 ug/l		Unknown - main peaks: 38-43*, 44, 51, 53, 55, 57, 84-85*, 86	
		593	4%	ISE 692	Unknown (2) main peaks: 38-43* 71*, 75-76, 83-85	ISE 692, 913, 1240, 1515 202
		683	5%	ISE 692		2278
		719	6%	ISE 692		
		724	3%	ISE 692		
		2227	2%	ISE 2278	↓	
SBLK4					None detected
SBLK5		662	18 ug/l		ALKYL HALIDE - main PEAKS 38-43*, 44, 51, 53-55, 57, 61, 65*	
		729	7%	ISE 823	ALKYL HALIDE (2) main peaks: 38, 41-43*, 76, 83	ISE 823, 1034, 1344, 1604, 1082
		801	7%	ISE 823	NLS	
		836	3%	ISE 823		
		851	7%	ISE 823		
		1021	1%	ISE 1034		
		1368	1%	ISE 1344		
		679	2%	ISE 823	↓	
CDR83		667	30 ug/l		ALKYL HALIDE	
		734	1%	ISE 829	NLS	ISE 829, 1041, 1351, 1613
		807	8%	ISE 829		
		858	4%	ISE 829		
		883	2%	ISE 829		
		980	1%	ISE 1041		
		1376	1%	ISE 1351		
		1537	<1%	ISE 1613	↓	
		1723	3%	ISE 1613	Unknown - main peaks 41, 56, 57, 104, 149*, 150	

NLS = no library search conducted

BLANK ANALYSIS RESULTS FOR TENTATIVELY IDENTIFIED COMPOUNDS

ISE 13852 – MEDIUM LEVEL

ALL TENTATIVELY IDENTIFIED COMPOUNDS FOUND IN BLANK ANALYSES ARE LISTED BELOW:

SAMPLE #	FRACTION	SCAN #(S) OR R.T	ESTIMATED CONCENTRATION	COMPOUND NAME	COMMENTS
VBLK5	VOA	282	190 ISe 307	UNKNOWN MAJOR PEAKS. 40, 43*, 72	ISe 307, 355 522
		388	190 ISe 352	METHYLBUTYL HYDROXYLAMINE – MAJOR PEAKS 39, 40, 41, 42*, 55, 57, 70, 71, 72	
		651	190 ISe 522		
		669	190 ISe 522		
VBLK6		242	290 ISe 305	NLS	ISe 305, 350, 519
		386	290 ISe 350		
		558	190 ISe 519		

NLS = no library search conducted

2B
SOIL VOLATILE SURROGATE RECOVERY

00198

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Level:(low/med) LOW

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	CDR88	109	86	91	0	0
02	CDR89	105	102	91	0	0
03	CDR90	104	98	94	0	0
04	CDR91	108	88	96	0	0
05	CDR92	104	96	92	0	0
06	CDR93	101	87	91	0	0
07	CDR94	114	78	101	0	0
08	CDR95	115	102	91	0	0
09	CDR98	116	89	101	0	0
10	CDR88MS	105	82	101	0	0
11	CDR88MSD	107	83	99	0	0
12	VBLK3	100	116	70	0	0
13	VBLK4	106	92	97	0	0
14	VBLK7	98	89	100	0	0

		QC LIMITS
S1 (TOL)	= Toluene-d8	(81-117)
S2 (BFB)	= Bromofluorobenzene	(74-121)
S3 (DCE)	= 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

2A

WATER VOLATILE SURROGATE RECOVERY

00191

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	CDR80	104	98	80	0	0
02	CDR81	108	102	106	0	0
03	CDR82	103	102	91	0	0
04	CDR83	104	103	88	0	0
05	CDR96	107	100	86	0	0
06	CDR80MS	98	95	101	0	0
07	CDR80MSD	99	95	101	0	0
08	VBLK1	102	100	90	0	0
09	VBLK2	104	101	80	0	0

		QC LIMITS
S1 (TOL)	= Toluene-d8	(88-110)
S2 (BFB)	= Bromofluorobenzene	(86-115)
S3 (DCE)	= 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix Spike - EPA Sample No.: CDR80

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.0	0	42.5	85	61-145
Trichloroethene	50.0	0	42.1	84	71-120
Benzene	50.0	22.8	63.0	80	76-127
Toluene	50.0	2.57	44.9	85	76-125
Chlorobenzene	50.0	0	45.9	92	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50.0	43.5	87	-2	14	61-145
Trichloroethene	50.0	47.1	94	-11	14	71-120
Benzene	50.0	65.4	85	-6	11	76-127
Toluene	50.0	47.9	91	-7	13	76-125
Chlorobenzene	50.0	48.7	97	-5	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: CDR80
GCMSK VOA CASE#13852-SDG# CDR80-5ML

3B

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix Spike - EPA Sample No.: CDR88 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	63.3	0	64.4	102	59-172
Trichloroethene	63.3	0	62.2	98	62-137
Benzene	63.3	0	62.4	99	66-142
Toluene	63.3	0	62.0	98	59-139
Chlorobenzene	63.3	0	61.5	97	60-133

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	63.3	60.1	95	7	22	59-172
Trichloroethene	63.3	61.5	97	1	24	62-137
Benzene	63.3	63.3	100	-1	21	66-142
Toluene	63.3	63.2	100	-2	21	59-139
Chlorobenzene	63.3	63.5	100	-3	21	60-133

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: CDR88
GCMSK VOA CASE#13852-SDG#CDR85-5G

3B

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix Spike - EPA Sample No.: CDR85 Level:(low/med) MED

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	7180	0	6220	87	59-172
Trichloroethene	7180	0	7660	107	62-137
Benzene	7180	1680	9450	108	66-142
Toluene	7180	2330	10500	114	59-139
Chlorobenzene	7180	0	8090	113	60-133

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	7180	5700	79	10	22	59-172
Trichloroethene	7180	7400	103	4	24	62-137
Benzene	7180	9670	111	-3	21	66-142
Toluene	7180	11000	121	-6	21	59-139
Chlorobenzene	7180	7920	110	3	21	60-133

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: CDR85
GCMSK VOA CASE#13852-SDG#CDR85-4G+10ML MEOH--100UL:5ML

2C

WATER SEMIVOLATILE SURROGATE RECOVERY

00923 ORIGINAL

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

	EPA SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	OTHER	TOT OUT
01	CDR80	76	75	54	48	43	46	0	0
02	CDR81	46	52	43	87	85	94	0	0
03	CDR82	73	75	40	84	74	86	0	0
04	CDR83	61	60	61	90	91	96	0	0
05	CDR80MS	84	81	67	94	88	96	0	0
06	CDR80MSD	82	79	67	81	79	88	0	0
07	SBLK1	59	55	59	94	96	96	0	0
08	SBLK3	42	49	50	84	76	90	0	0
09	SBLK5	85	80	79	90	88	90	0	0

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(35-114)
S2 (FBP)	= 2-Fluorobiphenyl	(43-116)
S3 (TPH)	= Terphenyl	(33-141)
S4 (PHL)	= Phenol-d5	(10-94)
S5 (2FP)	= 2-Fluorophenol	(21-100)
S6 (TBP)	= 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out

00025 ORIGINAL

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix Spike - EPA Sample No.: CDR80

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
Phenol	200	0	183	92 *	12- 89
2-Chlorophenol	197	0	183	93	27-123
1,4-Dichlorobenzene	101	0	62.6	62	36 97
N-Nitroso-di-n-prop.(1)	107	0	98.0	92	41 116
1,2,4-Trichlorobenzene	104	0	73.2	70	39 98
4-Chloro-3-methylphenol	199	0	200	100 *	23 97
Acenaphthene	102	0	85.4	84	46-118
4-Nitrophenol	200	0	193	96 *	10- 80
2,4-Dinitrotoluene	103	0	90.4	88	24- 96
Pentachlorophenol	207	0	220	106 *	9-103
Pyrene	105	0	87.8	84	26-127

Ok good recovery

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	200	154	77	18	42	12- 89
2-Chlorophenol	197	160	81	14	40	27-123
1,4-Dichlorobenzene	101	62.6	62	0	28	36 97
N-Nitroso-di-n-prop.(1)	107	96.2	90	2	38	41 116
1,2,4-Trichlorobenzene	104	72.4	70	0	28	39 98
4-Chloro-3-methylphenol	199	176	88	13	42	23 97
Acenaphthene	102	85.2	84	0	31	46-118
4-Nitrophenol	200	186	93 *	3	50	10- 80
2,4-Dinitrotoluene	103	87.6	85	3	38	24- 96
Pentachlorophenol	207	191	92	14	50	9-103
Pyrene	105	87.2	83	1	31	26-127

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 11 outside limits
Spike Recovery: 5 out of 22 outside limits

COMMENTS: CDR80
GCMSJ EPA CASE#13852,SDG#CDR80 500ML:1ML 042390

2D

SOIL SEMIVOLATILE SURROGATE RECOVERY

00924

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Level:(low/med) LOW

OK - no effect on detection limits from high recoveries and no similar compounds were detected in any of the soil samples

	EPA SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	OTHER	TOT OUT
01	CDR84	0 D	153 *	134	99	111	86	0	1
02	CDR85	88	85	74	86	93	74	0	0
03	CDR86	0 D	137 *	122	98	124 *	97	0	2
04	CDR87	47	88	77	80	86	74	0	0
05	CDR88	67	92	80	88	100	71	0	0
06	CDR89	57	76	69	77	90	60	0	0
07	CDR90	66	86	74	78	79	51	0	0
08	CDR91	66	86	78	79	85	74	0	0
09	CDR92	61	86	78	80	87	72	0	0
10	CDR93	70	91	84	88	101	74	0	0
11	CDR94	69	90	76	84	94	82	0	0
12	CDR95	84	95	97	96	98	88	0	0
13	CDR98	78	89	74	76	78	68	0	0
14	CDR85MS	103	90	84	99	98	78	0	0
15	CDR85MSD	117	94	87	92	78	41	0	0
16	SBLK2	72	89	86	93	106	66	0	0
17	SBLK4	83	91	95	97	94	83	0	0

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(23-120)
S2 (FBP)	= 2-Fluorobiphenyl	(30-115)
S3 (TPH)	= Terphenyl	(18-137)
S4 (PHL)	= Phenol-d5	(24-113)
S5 (2FP)	= 2-Fluorophenol	(25-121)
S6 (TBP)	= 2,4,6-Tribromophenol	(19-122)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out

3D

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix Spike - EPA Sample No.: CDR85 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
Phenol	7650	0	7160	94 *	26- 90
2-Chlorophenol	7530	0	7270	97	25-102
1,4-Dichlorobenzene	3870	0	3750	97	28 104
N-Nitroso-di-n-prop.(1)	4100	0	4130	101	41 126
1,2,4-Trichlorobenzene	3970	0	3900	98	38 107
4-Chloro-3-methylphenol	7620	0	7080	93	26 103
Acenaphthene	3920	0	4440	113	31-137
4-Nitrophenol	7650	0	6010	79	11-114
2,4-Dinitrotoluene	3940	0	4290	109 *	28- 89
Pentachlorophenol	7920	0	6770	85	17-109
Pyrene	4000	574	4750	104	35-142

OK good recovery

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	7650	6620	87	8	35	26- 90
2-Chlorophenol	7530	6160	82	17	50	25-102
1,4-Dichlorobenzene	3870	3900	101	-4	27	28 104
N-Nitroso-di-n-prop.(1)	4100	3870	94	7	38	41 126
1,2,4-Trichlorobenzene	3970	4130	104	-6	23	38 107
4-Chloro-3-methylphenol	7620	6120	80	15	33	26 103
Acenaphthene	3920	4210	107	5	19	31-137
4-Nitrophenol	7650	9840	129 *	-48	50	11-114
2,4-Dinitrotoluene	3940	4750	121 *	-10	47	28- 89
Pentachlorophenol	7920	6320	80	6	47	17-109
Pyrene	4000	4330	94	10	36	35-142

OK good recovery (no surrogate data)

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 11 outside limits
Spike Recovery: 4 out of 22 outside limits

COMMENTS: CDR85
GCMSL,CASE#13852,SDG#CDR80,EXT 4/18/90 30G:10ML

02063

WATER PESTICIDE SURROGATE RECOVERY

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT **Case No.:** 13852 SAS No.: _____ SDG No.: CDR80

	EPA SAMPLE NO.	S1 (DBC)#	OTHER
1	CDR80	39	0
2	CDR80MS	37	0
3	CDR80MSD	28	0
4	CDR81	48	0
5	CDR82	43	0
6	CDR83	30	0
7	PBLK1	83	0
8	PBLK3	81	0
9			
10			
11			
12			
13			
14			
15			
16			
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18			
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20			
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24			
25			
26			
27			
28			
29			
30			

ADVISORY QC LIMITS (24-150)

S1 (DBC) = Dibutylchlorendate

Column to be used to flag recovery values

* Values outside of QC limits

D Surrogates diluted out

page 1 of 1

FORM II PEST-1 EPA FMV.

MB 5/11/90

2F

SOIL PESTICIDE SURROGATE RECOVERY

02064

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No: _____ SDG No.: CDR80

Level:(low/med) LOW

	EPA SAMPLE NO.	S1 (DBC)#	OTHER
1	CDR84	57	0
2	CDR85	58	0
3	CDR85MS	46	0
4	CDR85MSD	51	0
5	CDR86	60	0
6	CDR87	44	0
7	CDR88	67	0
8	CDR89	51	0
9	CDR90	33	0
10	CDR91	40	0
11	CDR92	68	0
12	CDR93	59	0
13	CDR94	53	0
14	CDR95	56	0
15	CDR98	74	0
16	PBLK2	39	0
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

ADVISORY QC LIMITS (20-150)

S1 (DBC) = Dibutylchlorendate

Column to be used to flag recovery values

* Values outside of QC limits

D Surrogates diluted out

MB 5/14/90

FORM II PEST-2 1/87 Rev.

3E

WATER PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix Spike - EPA Sample No.: CDR80

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
gamma-BHC (Lindane)	0.205	0.000	0.181	88	56-123
Heptachlor	0.204	0.000	0.083	41	40-131
Aldrin	0.204	0.000	0.063	31 *	40-120
Dieldrin	0.501	0.000	0.218	44 *	52-126
Endrin	0.499	0.000	0.277	56	56-121
4,4'-DDT	0.499	0.000	0.345	69	38-127

UK - MSD recovery acceptable so no problem this sample

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
gamma-BHC (Lindane)	0.205	0.205	100	12	15	56-123
Heptachlor	0.204	0.094	46	12	20	40-131
Aldrin	0.204	0.069	34 *	9	22	40-120
Dieldrin	0.501	0.286	57	27 *	18	52-126
Endrin	0.499	0.380	76	31 *	21	56-121
4,4'-DDT	0.499	0.303	61	13	27	38-127

Column to be used to flag recovery and RPD values with an asterisk

***** Values outside of QC limits

RPD: 2 out of 6 outside limits
Spike Recovery: 3 out of 12 outside limits

COMMENTS: * MATRIX INTERFERENCE

02066

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

ORIGINAL

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Matrix Spike - EPA Sample No.: CDR85 Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC	#	QC LIMITS REC.
gamma-BHC (Lindane)	31.4	0.0	14.1	45	*	46-127
Heptachlor	31.3	0.0	22.[illegible]	70		35-130
Aldrin	31.3	0.0	24.1	77		34-132
Dieldrin	76.8	0.0	54.[illegible]	71		31-134
Endrin	76.5	0.0	64.4	84		42-139
4,4'-DDT	76.5	0.0	43.4	57		23-134

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC	#	% RPD	#	QC LIMITS RPD	QC LIMITS REC.
gamma-BHC (Lindane)	31.4	17.7	56		23		50	46-127
Heptachlor	31.3	26.2	84		7		31	35-130
Aldrin	31.3	25.5	81		6		43	34-132
Dieldrin	76.8	62.9	82		15		38	31-134
Endrin	76.5	71.1	93		11		45	42-139
4,4'-DDT	76.5	53.9	70		22		50	23-134

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 6 outside limits
Spike Recovery: 1 out of 12 outside limits

COMMENTS: * DUE TO MATRIX INTERFERENCE

MS 5/14/90

7A

VOLATILE CONTINUING CALIBRATION CHECK

00704

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Instrument ID: GCMSK Calibration date: 04/19/90 Time: 0918

Lab File ID: MSVEK207 Init. Calib. Date(s): 04/16/90 04/16/90

Matrix:(soil/water) SOIL Level:(low/med) MED Column:(pack/cap) CAP

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) = 25.0

COMPOUND		RRF	RRF50	%D	
Chloromethane	#	2.048	1.820	11.1	#
Bromomethane		1.180	1.422	-20.5	
Vinyl Chloride	*	1.615	1.435	11.2	* nd
Chloroethane		0.744	0.937	-25.9	
Methylene Chloride		2.299	2.120	7.8	
Acetone		0.217	0.227	-4.6	
Carbon Disulfide		4.827	4.769	1.2	
1,1-Dichloroethene	*	1.383	1.642	-18.7	*
1,1-Dichloroethane	#	3.494	3.009	13.9	#
1,2-Dichloroethene (total)		1.663	1.700	-2.2	
Chloroform	*	3.158	3.028	4.1	* de estimated
1,2-Dichloroethane		2.075	2.110	-1.7	
2-Butanone		0.066	0.043	34.8	
1,1,1-Trichloroethane		0.594	0.497	16.3	
Carbon Tetrachloride		0.527	0.446	15.4	nd
Vinyl Acetate		0.815	0.587	28.0	
Bromodichloromethane		0.779	0.675	13.4	
1,2-Dichloropropane	*	0.455	0.430	5.5	*
cis-1,3-Dichloropropene		0.745	0.709	4.8	
Trichloroethene		0.442	0.395	10.6	
Dibromochloromethane		0.521	0.490	6.0	
1,1,2-Trichloroethane		0.309	0.302	2.3	
Benzene		1.053	0.908	13.8	
trans-1,3-Dichloropropene		0.294	0.296	-0.7	
Bromoform	#	0.362	0.310	14.4	#
4-Methyl-2-Pentanone		0.612	0.507	17.2	
2-Hexanone		0.172	0.150	12.8	
Tetrachloroethene		0.398	0.365	8.3	nd
1,1,2,2-Tetrachloroethane	#	0.809	0.612	24.4	#
Toluene	*	0.747	0.675	9.6	*
Chlorobenzene	#	0.987	0.929	5.9	#
Ethylbenzene	*	0.477	0.439	8.0	*
Styrene		0.957	0.877	8.4	
Xylenes (Total)		0.639	0.541	15.3	
Toluene-d8		1.283	1.181	8.0	
Bromofluorobenzene		1.034	0.944	8.7	
1,2-Dichloroethane-d4		2.053	2.067	-0.7	

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: IT CERRITOS Contract: 68-W8-0068

Lab Code: IT Case No.: 13852 SAS No.: _____ SDG No.: CDR80

Instrument ID: GCMSK Calibration date: 04/20/90 Time: 0655

Lab File ID: MSVEK210 Init. Calib. Date(s): 04/16/90 04/16/90

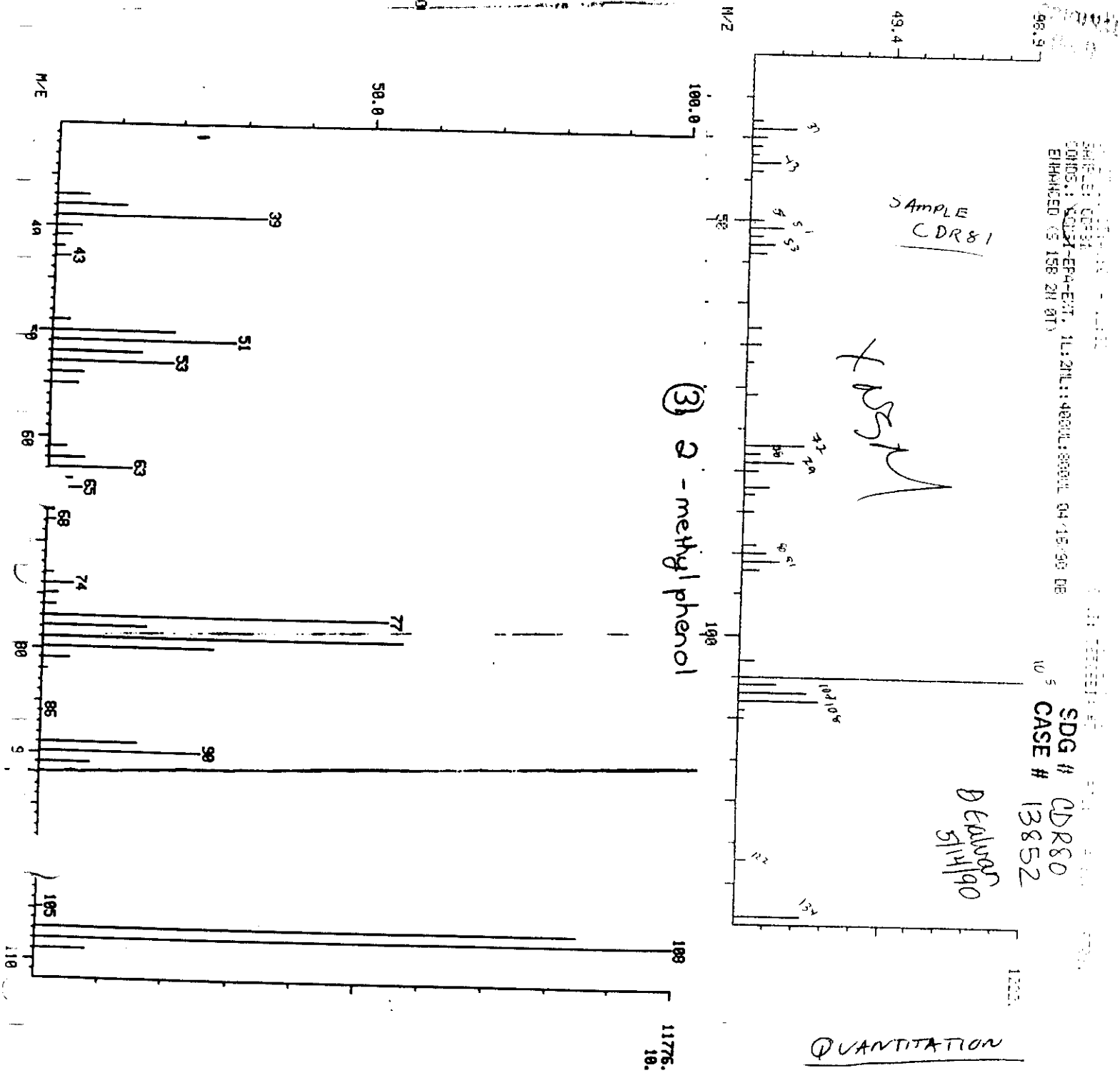
Matrix:(soil/water) SOIL Level:(low/med) MED Column:(pack/cap) CAP

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) = 25.0

COMPOUND		RRF	RRF50	%D	
Chloromethane	#	2.048	1.598	22.0	#
Bromomethane		1.180	1.256	-6.4	
Vinyl Chloride	*	1.615	1.248	22.7	*
Chloroethane		0.744	0.813	-9.3	
Methylene Chloride		2.299	1.893	17.5	
Acetone		0.217	0.201	7.4	
Carbon Disulfide		4.827	4.611	4.5	
1,1-Dichloroethene	*	1.383	1.422	-2.8	*
1,1-Dichloroethane	#	3.494	3.937	-12.7	#
1,2-Dichloroethene (total)		1.663	1.692	-1.7	
Chloroform	*	3.158	3.201	-1.4	*
1,2-Dichloroethane		2.075	2.073	~~0.1~~	
2-Butanone		0.066	0.046	30.3	
1,1,1-Trichloroethane		0.594	0.508	14.5	
Carbon Tetrachloride		0.527	0.447	15.2	
Vinyl Acetate		0.815	0.724	11.2	
Bromodichloromethane		0.779	0.681	12.6	
1,2-Dichloropropane	*	0.455	0.450	1.1	*
cis-1,3-Dichloropropene		0.745	0.723	3.0	
Trichloroethene		0.442	0.378	14.5	
Dibromochloromethane		0.521	0.479	8.1	
1,1,2-Trichloroethane		0.309	0.296	4.2	
Benzene		1.053	0.946	10.2	
trans-1,3-Dichloropropene		0.294	0.296	-0.7	
Bromoform	#	0.362	0.298	17.7	#
4-Methyl-2-Pentanone		0.612	0.529	13.6	
2-Hexanone		0.172	0.157	8.7	
Tetrachloroethene		0.398	0.357	10.3	
1,1,2,2-Tetrachloroethane	#	0.809	0.628	22.4	#
Toluene	*	0.747	0.695	7.0	*
Chlorobenzene	#	0.987	0.943	4.5	#
Ethylbenzene	*	0.477	0.447	6.3	*
Styrene		0.957	0.886	7.4	
Xylenes (Total)		0.639	0.550	13.9	
Toluene-d8		1.283	1.241	3.3	
Bromofluorobenzene		1.034	1.011	2.2	
1,2-Dichloroethane-d4		2.053	2.107	-2.6	

dl estimated
%D (but not RRFs) ND
on-not
detection limits not affected

SAMPLE CDR81: SPECTRA FOR COMPOUND WITH RETENTION 12:32 SHOWING MATCH WITH 2-METHYL PHENOL



RETENTION TIME MATCH

	SAMPLE CDR81	4/25/90 DAILY STANDARD	SHIFT
INT. STND #1	693	693	0
2-METHYL PHENOL	752	752	0
INTERNAL STND #2	914	914	0

QUANTITATION

$$\text{Conc} = \frac{\text{area compound}}{\text{area INT STND}} \times \frac{\text{conc INT STND}}{} \times \frac{1}{\text{response factor}} \times \text{SPLIT} \times \text{DILUTION FACTOR}$$

Conc INT STND = 40 ng/l
area compound = 995
area INT STND #1 = 15848
response factor = 1.328
SPLIT = 2
Dilution factor = 2

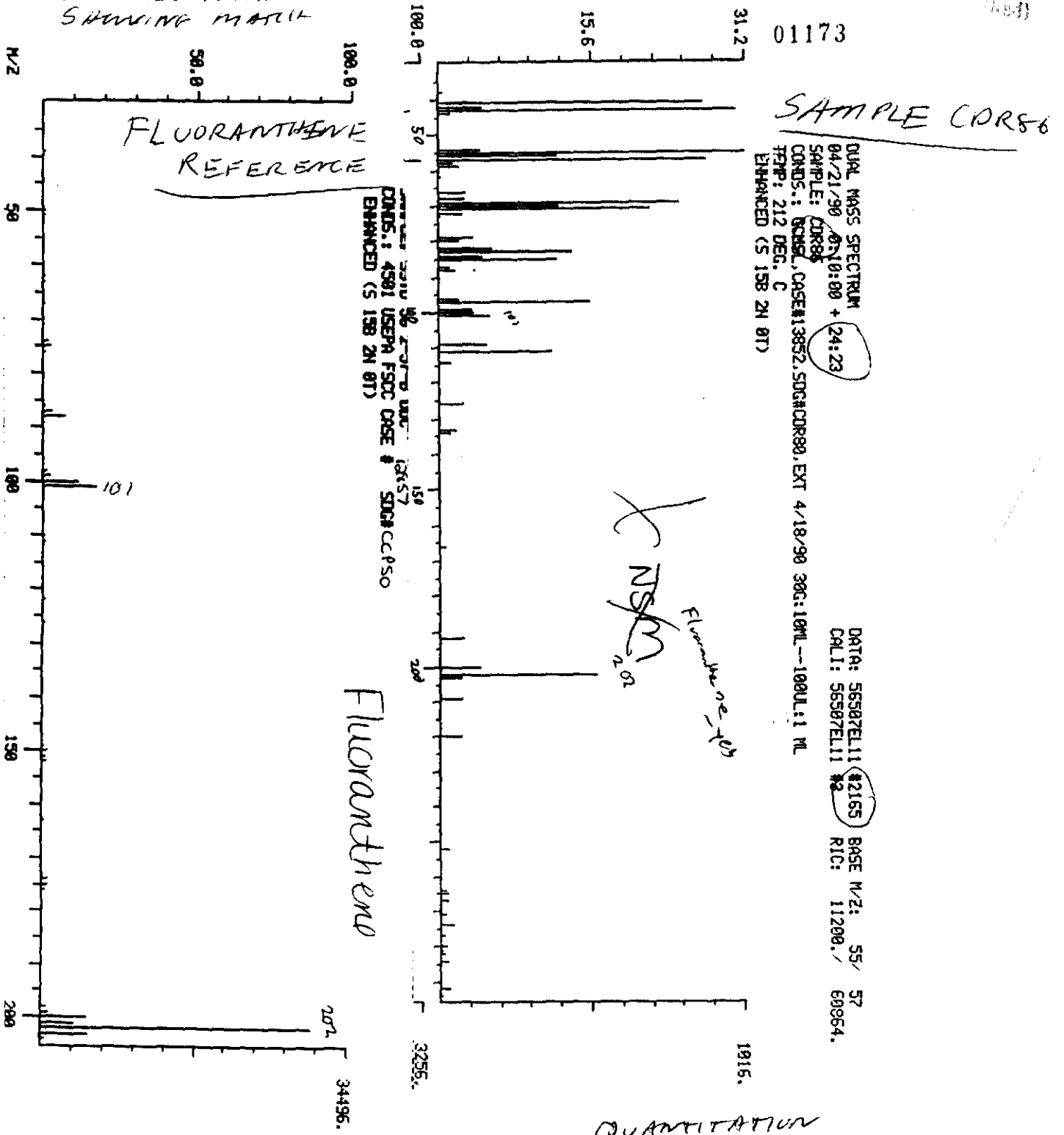
$$\text{CONC} = \frac{995}{15848} \times 40\,\text{ng/l} \times \frac{1}{1.328} \times 2 \times 2$$

$$= 7.6\ \text{ng/l}$$

SAMPLE CDR86: COMPARISON OF SPECTRA OF COMPOUND WITH RT 24:23 WITH REFERENCE SPECTRA FOR FLUORANTHENE SHOWING MATCH

ORIGINAL

01173



Retention time match

	DAILY STANDARD	SAMPLE CDR86	SHIFT
IS #4	1837	1842	+5
FLUORANTHENE	2162	2165	+3
IS #5	2553	2553	+0

QUANTITATION

$$\text{Conc} = \frac{\text{area compound}}{\text{area internal std}} \times \text{Conc. Int Standard} \times \frac{1}{\text{response factor}} \times \frac{1000\ \text{ng/ug}}{30.0\ \text{grams used}} \times \frac{100\ \%}{\%\ \text{solids}} \times \text{Dilution factor}$$

area Fluoranthene = 4826

area Int Std #4 = 80875

Conc Int Standard #4 = 40 ng/l

response factor = 0.452

% solids = 85%

Dilution factor = 100

$$\text{CONC} = \frac{4826}{80875} \times 40\ \text{ng/l} \times \frac{1}{.452} \times \frac{1000\ \text{ng/ug}}{30.0\ \text{g}} \times \frac{100\ \%}{85\ \%} \times 100$$

$$= \boxed{9800\ \text{ng/kg}}$$

SAMPLE CDR86: COMPARISON OF SPECTRA FOR RT 16.23 AND STANDARD SPECTRA FOR ACENAPHTHENE SHOWING MATCH - BUT RETENTION TIME SLIGHTLY OFF INDEX

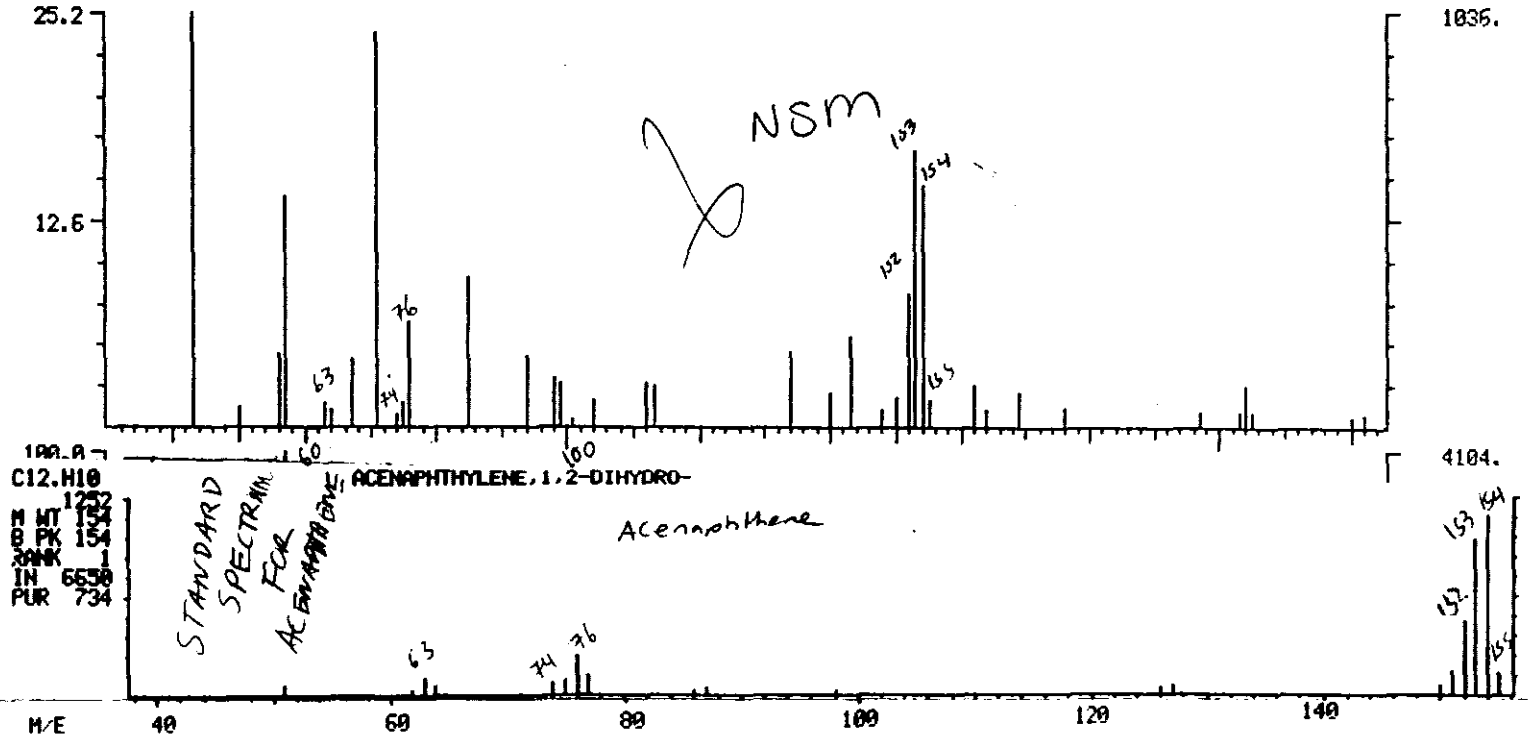
INTERNAL STANDARD SHIFTS MADE THE ACCURACY

SAMPLE CDR86

0116??

DUAL MASS SPECTRUM
04/21/90 0:10:00 + 16:23
SAMPLE: CDR86
CONDS.: GCMS,CASE#13852,SDG#CDR80,EXT 4/18/90 30G:10ML--100UL:1 ML
TEMP: 148 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 56507EL11 #1455 BASE M/Z: 43/ 57
CALI: 56507EL11 #3 RIC: 7456./ 62976.



Quantation

$$\text{Conc} = \frac{\text{area Compound}}{\text{area Internal Standard}} \times \text{Concentration Int. Standard} \times \frac{1}{\text{response factor}} \times \frac{100\%}{\%\text{ Solids}}$$

area compound 2261
area Int std 43433
conc Int std 40 ng/µl
response factor 1.1868
% solids 85%

$$\text{Conc} = \frac{2261}{43433} \times \frac{1}{1.1868} \times \frac{40\text{ ng}}{\mu l} \times \frac{100\%}{85\%} \times \frac{10000\text{ µl/ml}}{30.0\text{ gms}} \times 100$$

= 1670 ug/kg

Retention time

	Daily Stnd 4/20/90	Sample CDR86	Shift
IS #3	1446	1449	+ 3
Acenaphthene	1455	1455	0
IS #4	1837	1842	+ 5

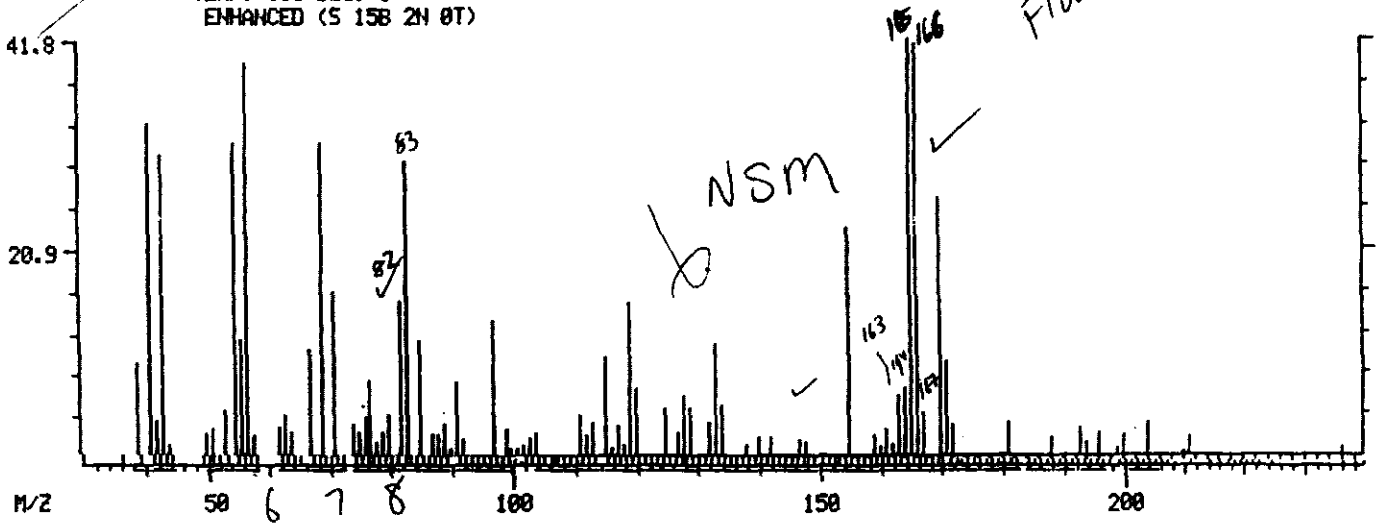
SAMPLE CDR86: COMPARISON OF SPECTRA FOR COMPOUND WITH RT 17.66 AND REFERENCE SPECTRA FOR FLUORENE STANDARD

01169

DUAL MASS SPECTRUM
04/21/90 8:10:00 + 17:56
SAMPLE: CDR86
CONDS.: GCMSL,CASE#13852,SDG#CDR80,EXT 4/18/90 30G:10ML--100UL:1 ML
TEMP: 161 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 56507EL11 #1593 BASE M/Z: 165/ 57
CALI: 56507EL11 #3 RIC: 23648./ 81408.

SAMPLE CDR86



1526.

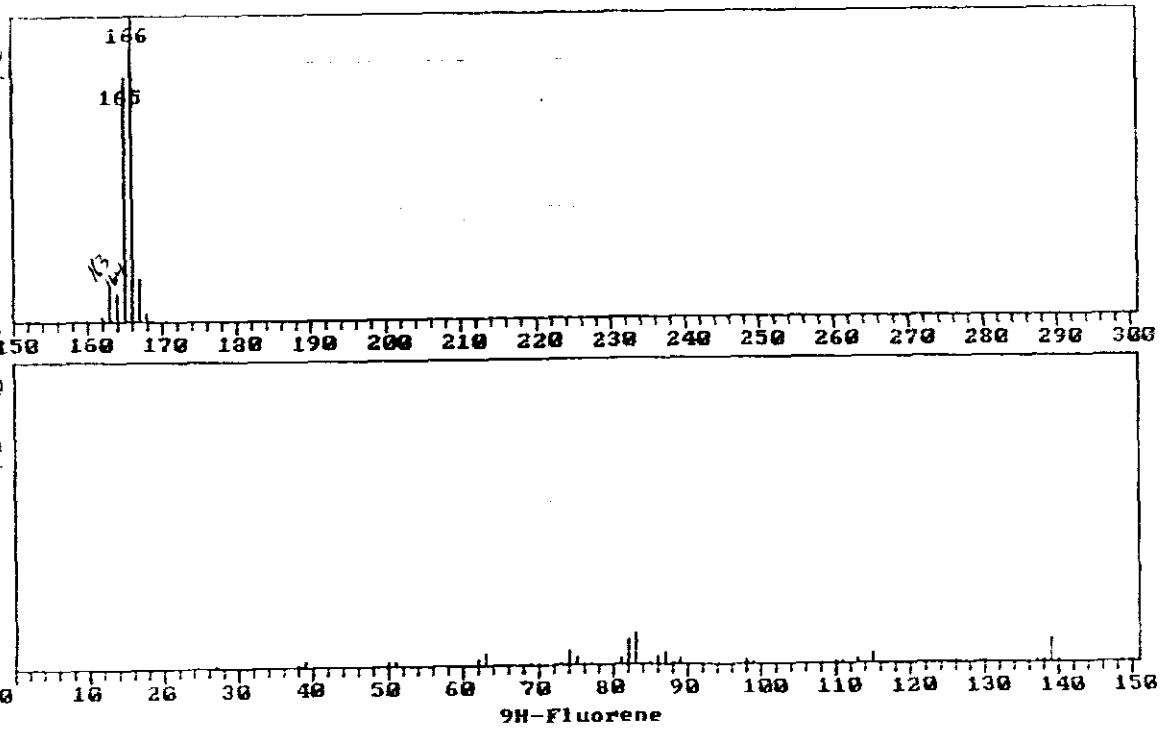
Quantitation

$$\text{Conc} = \frac{\text{area compound}}{\text{Int Std area}} \times \frac{\text{Conc Int Std}}{\text{response factor}} \times \frac{1000\,\text{ml}}{30.0\,\text{g sample}} \times \frac{100\%}{\text{\% solids}}$$

area compound = 6279
area Int Std = 43433
concentration Int Std = 40 ng/ml
response factor = 1.361
percent solids = 85%
Dilution factor = 100 x

$$\text{Conc} = \frac{6279}{43433} \times 40\,\text{ng/ml} \times \frac{1}{1.361} \times \frac{1000\,\text{ml}}{30.0\,\text{g}} \times \frac{100\%}{85\%} = \boxed{16700\,\text{ng/kg}}$$

REFERENCE SPECTRA



Retention time match

4/20/90 Daily Standard

	Sample CDR86	SHIFT
INT STND #3	1449	+3
FLUORENE	1593	+2
INT STND #4	1847	+5
	1446	
	1591	
	1837	

PROJECT NAME: CROWN
TDD NO.: F3-9003-05

EPA SITE NO.: MD713
REGION: III

SUPPORT DOCUMENTATION FOR THE REVIEW OF INORGANIC ANALYTICAL DATA PACKAGE

CASE/SAS NO.: 13852
TYPE OF ANALYSIS: INORGANIC
CONTRACT LABORATORY: COLUMBIA
APPLICABLE IFB OR SOW: 7/88
REVIEWER: DANIEL O. BENEDICT
REVIEW DATE: 9/19/90

APPLICABLE SAMPLE NO's.: MLCD00 - MLCD15, MLCD17

THE FOLLOWING TABLE INDICATES AREAS WHICH WERE EXAMINED IN DETAIL, THE IDENTIFIED PROBLEM AREAS, AND SUPPORT DOCUMENTATION ATTACHMENTS:

	AREAS EXAMINED IN DETAIL (CHECK (✓) IF YES OR FOOTNOTE LETTER FOR COMMENTS BELOW)					PROBLEM AREAS IDENTIFIED (CHECK (✓) IF YES OR FOOTNOTE NUMBER FOR COMMENTS BELOW)					SUPPORT DOCUMENTATION ATTACHMENTS (CHECK (✓) IF YES OR IDENTIFY ATTACHMENT NO.)				
	ALL APPLICABLE ANALYSES	ICP OR A.A. METALS	FURNACE METALS	COLD VAPOR MERCURY	CYANIDE	ALL APPLICABLE ANALYSES	ICP OR A.A. METALS	FURNACE METALS	COLD VAPOR MERCURY	CYANIDE	ALL APPLICABLE ANALYSES	ICP OR A.A. METALS	FURNACE METALS	COLD VAPOR MERCURY	CYANIDE
HOLDING TIMES	X														
BLANK ANALYSIS RESULTS	X						X	X			X				
MATRIX SPIKES (PRE-DIGESTION)	X						X	X		X	X				
DUPLICATES	X						X				X				
QUANTITATION OF RESULTS	X														
DETECTION LIMITS/SENSITIVITY	X										X				
INITIAL CALIBRATIONS	X														
CONTINUING CALIBRATIONS	X														
LABORATORY CONTROL STANDARDS	X														
ICP LINEAR RANGE ANALYSIS	X														
ICP INTERFERENCE CHECKS	X														
ICP SERIAL DILUTIONS	X						X				X				
GFAA POST-DIGESTION SPIKES	X										X				
GFAA DUPLICATE BURNS	X														
GFAA STANDARD ADDITIONS	X										X				
OTHERS															

COMMENTS:

CASE 13852

BLANK ANALYSIS RESULTS

TASK	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT)
INR	LAB	LOW	AQ	CCB	LAB	ALUMINUM (22.8 ug/l / 20.0 ug/l)
						CALCIUM (22.9 ug/l / 10.0 ug/l)
						COPPER (3.2 ug/l / 2.0 ug/l)
						* IRON (21.6 ug/l / 4.0 ug/l)
						* POTASSIUM (806 ug/l / 700 ug/l)
						* SELENIUM (2.8 ug/l / 2.0 ug/l)
						THALLIUM (2.0 ug/l / 1.0 ug/l)
			LAB	PB		CALCIUM (15.9 ug/l / 10.0 ug/l)
						* COPPER (24.0 ug/l / 2.0 ug/l)
						IRON (7.9 ug/l / 4.0 ug/l)
			LAB	ICB		None detected
			LAB	PB		* ALUMINUM (7.178 mg/kg / 4.0 mg/kg)
						BARIUM (0.258 mg/kg / 0.20 mg/kg)
						CALCIUM (2.854 mg/kg / 2.0 mg/kg)
						* CHROMIUM (0.832 mg/kg / 0.60 mg/kg)
						COPPER (3.440 mg/kg / 0.40 mg/kg)
						IRON (0.944 mg/kg / 0.80 mg/kg)
						* LEAD (0.220 mg/kg / 0.20 mg/kg)
						SELENIUM (0.460 mg/kg / 0.40 mg/kg)
			FIELD	MCCD03	NUS	* CALCIUM (34.5 ug/l / 20.0 ug/l)
						IRON (17.1 ug/l / 4.0 ug/l)

LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM SAMPLE ANALYTICAL DATA SUMMARY.

COMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM RAW DATA

* HIGHEST RESULT FOUND IN ANY BLANK

CCB RESULTS ARE A COMPILATION OF THE HIGHEST LEVELS FOUND IN ANY CCB

U.S. EPA - CLP

3
BLANKS

Lab name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	20.0	U	20.0	U	20.0	U	20.0	U	20.000	U	P
Antimony	20.0	U	20.0	U	20.0	U	20.0	U	-20.600	B	P
Arsenic	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	F
Barium	1.0	U	1.0	U	1.0	U	1.0	B	1.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Cadmium	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	P
Calcium	10.0	U	10.0	U	11.6	B	17.0	B	15.900	B	P
Chromium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Cobalt	4.0	U	4.0	U	4.0	U	4.0	U	4.000	U	P
Copper	2.0	U	2.0	U	3.2	B	2.0	U	24.000	B	P
Iron	4.0	U	4.0	U	8.8	B	14.2	B	7.900	B	P
Lead	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	F
Magnesium	50.0	U	50.0	U	50.0	U	50.0	U	50.000	U	P
Manganese	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Mercury	.2	U	.2	U	.2	U	.2	U	.200	U	CV
Nickel	10.0	U	10.0	U	10.0	U	10.0	U	10.000	U	P
Potassium	700.0	U	700.0	U	700.0	U	731.9	B	700.000	U	P
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Silver	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	P
Sodium	60.0	U	60.0	U	60.0	U	60.0	U	60.000	U	P
Thallium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	F
Vanadium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Zinc	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	P
Cyanide	10.0	U	10.0	U	10.0	U	10.0	U	10.000	U	C

U.S. EPA - CLP

3
BLANKS

Lab name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			20.0	U	22.8	B			7.178	B	P
Antimony			20.0	U	20.0	U			4.000	U	P
Arsenic			1.0	U	1.0	U	1.0	U	.200	U	F
Barium			1.0	B	1.0	U			.258	B	P
Beryllium			1.0	U	1.0	U			.200	U	P
Cadmium			2.0	U	2.0	U			.400	U	P
Calcium			22.9	B	29.9	B			2.854	B	P
Chromium			3.0	U	3.0	U			.832	B	P
Cobalt			4.0	U	4.0	U			.800	U	P
Copper			2.4	B	2.0	U			3.440	B	P
Iron			18.9	B	21.6	B			.944	B	P
Lead			1.0	U	1.0	U	1.0	U	.220	B	F
Magnesium			50.0	U	50.0	U			10.000	U	P
Manganese			1.0	U	1.0	U			.200	U	P
Mercury			.2	U	.2	U			.100	U	CV
Nickel			10.0	U	10.0	U			2.000	U	P
Potassium			801.6	B	806.0	B			-157.712	B	P
Selenium	2.0	U	2.0	U	2.0	U	2.1	B	.460	B	F
Silver			2.0	U	2.0	U			.400	U	P
Sodium			60.0	U	60.0	U			12.000	U	P
Thallium			1.2	B	1.0	U	1.0	U	.200	U	F
Vanadium			3.0	U	3.0	U			.600	U	P
Zinc			2.0	U	2.0	U			.400	U	P
Cyanide			10.0	U	10.0	U	10.0	U	1.000	U	C

U.S. EPA - CLP

3
BLANKS

Lab name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											
Antimony											
Arsenic			1.0	U	1.0	U					F
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead			1.0	U							F
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium			2.0	U	2.0	U	2.7	B			F
Silver											
Sodium											
Thallium			1.0	U							F
Vanadium											
Zinc											
Cyanide	10.0	U	10.0	U	10.0	U					C

U.S. EPA - CLP

3
BLANKS

Lab name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium	2.0	U	2.0	U	2.0	U	2.0	U			F
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

3
BLANKS

Lab name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium	2.0	U	2.0	U	2.8	B					F
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

3
BLANKS

Lab name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium	2.0	U	2.0	U	2.0	U					F
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

MCCD00S

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	3063.4000		998.5700		2000.00	103.2		P
Antimony	75-125	490.8500		20.0000	U	500.00	98.2		P
Arsenic	75-125	95.2000		61.4000		40.00	84.5		F
Barium	75-125	2090.6700		84.4500	B	2000.00	100.3		P
Beryllium	75-125	53.5500		1.0000	U	50.00	107.1		P
Cadmium	75-125	44.3700		2.0000	U	50.00	88.7		P
Calcium		120,000		120,000					NR
Chromium	75-125	223.1300		23.3200		200.00	99.9		P
Cobalt	75-125	491.4200		4.0000	U	500.00	98.3		P
Copper	75-125	474.4900		211.5000		250.00	105.2		P
Iron	75-125	4836.1100		3651.7500		1000.00	118.4		P
Lead		436.0000		420.0000		20.00	80.0		F
Magnesium		15,200		15,500					NR
Manganese	75-125	871.8900		366.6800		500.00	101.0		P
Mercury	75-125	1.0800		.2000	U	1.00	108.0		CV
Nickel	75-125	518.2900		10.0000	U	500.00	103.7		P
Potassium		32,970		33,500					NR
Selenium	75-125	12.5000		2.0000	U	10.00	125.0		F
Silver	75-125	48.0000		2.0000	U	50.00	96.0		P
Sodium		71000		67100					NR
Thallium	75-125	48.7000		1.3000	B	50.00	94.8		F
Vanadium	75-125	510.5500		14.7600	B	500.00	99.2		P
Zinc	75-125	773.5500		289.6800		500.00	96.8		P
Cyanide	75-125	102.9800		10.0000	U	100.00	103.0		C

Comments:

Lead

	SSR	SR	SA	%R
MCC000	436 ug/L	420 ug/L	20 ug/L	80 %
MCC008 (duplicate)	436 ug/L	424 ug/L	20 ug/L	60 %

Spike level too small relative to minor variability in sample concentration

FORM V (Part 1) - IN

13852

03042

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

MCCD05S

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Matrix: SOIL Level (low/med): LOW

% Solids for Sample: 87.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

primarily sample inhomogeneity but some dilution (?)

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum		16000 mg/kg		16700 mg/kg					NR
Antimony	75-125	69.8924		4.5767	U	114.42	61.1	N	P
Arsenic		20.9382		56.0641		9.15	-383.9		F
Barium	75-125	492.3455		50.3890		457.67	96.6		P
Beryllium	75-125	12.4211		.6590	B	11.44	102.8		P
Cadmium	75-125	9.6087		.4577	U	11.44	84.0		P
Calcium		185000 mg/kg		149700 mg/kg					NR
Chromium	75-125	70.1808		42.1396		45.77	61.3	N	P
Cobalt	75-125	110.5195		3.4416	B	114.42	93.6		P
Copper		329.8009		291.2082		57.21	67.5		P
Iron		33200 mg/kg		48100 mg/kg					NR
Lead		213.9588		226.5446		SPIKE 4.58	-274.8		F
Magnesium		59000 mg/kg		43300 mg/kg					NR
Manganese	75-125	288.6934		193.0572		114.42	83.6		P
Mercury	75-125	.6808		.1253		.57	97.5		CV
Nickel	75-125	121.6476		14.0824		114.42	94.0		P
Potassium		2300 mg/kg		3020 mg/kg					NR
Selenium	75-125	3.0206		3.8215		2.29	-35.0	N	F
Silver	75-125	11.9771		1.0801	B	11.44	95.3		P
Sodium		5690 mg/kg		4910 mg/kg					NR
Thallium	75-125	11.7849		.4577	B	11.44	99.0		F
Vanadium	75-125	131.5378		28.5492		114.42	90.0		P
Zinc	75-125	419.5995		331.6499		114.42	76.9		P
Cyanide	75-125	21.8021		17.7059		5.72	71.6	N	C

pos results

Comments:

arsenic	SSR (mg/L)	SR (mg/L)	SA (mg/L)	%R
MCCD05	91.5	245	40	-384
MCCD05 (Lab dup)	91.5	730	40	(-) 46.3

lead	SSR (mg/L)	SR (mg/L)	SA (mg/L)	%R
MCCD05	935	940	200	(-) 275 %
MCCD05 (lab dup)	935	1325	200	(-) 1950 %

Spike amount is dwarfed by minor percentage variability in the much larger sample concentration

FORM V (Part 1) - IN

13852

03043

ORIGINAL (Red)

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

MCCD05A

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Matrix: SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony		94.77		20.00	U	120.0	79.0		P
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium		527.01		184.15		400.0	85.7		P
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide		910.00		309.50		600.0	100.1		C

good recovery - digestion losses

(maybe some matrix interference as well for antimony)

good recovery - distillation loss

Comments:

FORM V (Part 2) - IN

CASE 13852

ELEMENT: ARSENIC

SPIKE RECOVERIES

MCC000 (AQ): 87.5
MCC005 (SOLID): 39.4 (46.3% if dilution level is used) – possible digestion loss, but also a large inhomogeneity effect

Spike Recovery Evaluation Form

% SOLIDS	SAMPLE ID	Sample #	Instr. Level Result (ug/l)	PDS Recovery (%)	Diluted Result (ug/l)	Diluted Recovery (%)	MSA Result (if needed)	Final Result Reported
	AQ-1	MCC000			30.7 DF=2x	92.5		61.4 ug/l
	AQ-10 (dup AQ-1)	MCC002			20.9 DF=5x	95.5		104 ug/l
	AQ-2	MCC001	7.0	92.6				7.0 ug/l
	AQ-blank (blank)	MCC003	0.1	96.6				undetected
88.6	SUB-1	MCC004			12.6 DF=25x	96.5		71.1 mg/kg
85.7	SUB-10	MCC006			27.3 DF=10x	98.5		63.7 mg/kg
87.4	SUB-2	MCC005	49.0 DF=5x	— over cal.	24.5 DF=10x	96.5		56.1 mg/kg
8	SUB-3	MCC007			28.4 DF=100x	97.0		759 mg/kg
77.5	SUB-4	MCC008			21.2 DF=10x	95.0		54.7 mg/kg
91.1	SUB-5	MCC009	9.8	90.5				2.2 mg/kg
92.4	SUB-6	MCC010			12.6 DF=10x	100		27.3 mg/kg
64.7	SUB-7	MCC011			14.6 DF=10x	98.6		45.1 mg/kg
89.8	SUB-8	MCC012			14.9 DF=2x	92.6		6.6 mg/kg
88.8	SUB-9	MCC013			14.0 DF=50x	99.0		158 mg/kg
76.6	SD-1	MCC014			29.8 DF=50x	100		389 mg/kg
75.0	SD-10 (dup SD-1)	MCC017			38.0 DF=50x	104		507 mg/kg
7	S-BACK (off-site background)	MCC015	10.9	95.0	5.6 DF=2x	97.0		2.5 mg/kg
	DUP AQ-1	MCC000			30.9 DF=2x	95.5		61.8 ug/l
87.4	DUP SUB-2	MCC005			14.6 DF=5x	95.6		16.7 mg/kg
87.4	matrix spike SUB-2	MCC005			18.3 DF=5x			20.9 mg/kg

FOR SOLID SAMPLES FINAL RESULT = INSTRUMENT LEVEL (mg/L) × 0.2 × 100% / % SOLIDS

CASE 13852

ELEMENT: LEAD

SPIKE RECOVERIES
MCCD00 (AQ): 80 %
MCCD05 (SOLID): → 275 %

Spike Recovery Evaluation Form

% SOLIDS	SAMPLE ID	Sample #	Instr. Level Result (mg/l)	PDS Recovery (%)	Diluted Result (mg/l)	Diluted Recovery (%)	MSA Result (if needed)	Final Result Reported	ICP result
	AQ-1	MCCD00			DF=20x 21.6	101		420 mg/l	* 487
	AQ-10 (dup AQ-1)	MCCD02			DF=20x 19.2	97.0		384 mg/l	* 420
	AQ-2	MCCD01			DF=10x 14.9	95.5		149 mg/l	* 157
	AQ-blank (blank)	MCCD03	0.7	92.0				undetected	—
88.6	SUB-1	MCCD04			DF=1000x 12.1	95.5		2730 mg/kg	* 3500
85.7	SUB-10	MCCD06			DF=1000x 12.5	99.5		2920 mg/kg	* 3620
87.4	SUB-2	MCCD05			DF=50x 19.8	98.0		227 mg/kg	* 263
8	SUB-3	MCCD07			DF=100x 14.1	96.5		377 mg/kg	* 499
77.5	SUB-4	MCCD08			DF=50x 21.5	97.5		277 mg/kg	* 323
91.1	SUB-5	MCCD09			DF=5x 9.1	91.0		10.0 mg/kg	* 19.0
92.4	SUB-6	MCCD10			DF=50x 14.8	93.5		160 mg/kg	* 165
64.7	SUB-7	MCCD11	DF=260x 43.1	over cal	DF=500x 22.4	98.5		* 3460 mg/kg	2260
89.8	SUB-8	MCCD12			DF=50x 10.2	96.0		114 mg/kg	* 125
88.8	SUB-9	MCCD13			DF=100x 23.1	101		520 mg/kg	* 657
76.6	SD-1	MCCD14			DF=200x 14.9	99.5		778 mg/kg	* 831
75.0	SD-10 (dup SD-1)	MCCD17			DF=500x 16.0	98.0		2130 mg/kg	* 2930
7	S-BACK (offsite background)	MCCD15			DF=50x 11.2	98.5		* 125 mg/kg	112
	DUP AQ-1	MCCD00			DF=20x 21.2	97.5		424 mg/l	487
7.4	DUP SUB-2	MCCD05			DF=50x 26.5	99.0		303 mg/kg	245

FOR SOLID SAMPLES FINAL RESULT = INSTRUMENT LEVEL (mg/l) × 0.2 × 100% / % SOLIDS

* = result reported on data summary

CASE 13852

ELEMENT: SELENIUM

ORIGINAL

Spike Recoveries

MCCD00 (AQ): 125
MCCD05 (SOLID): -35.0 (ok - sample inhomogeneity effect! if MCCD05 duplicate analysis is used, % R becomes 98 %)

Spike Recovery Evaluation Form

% SOLIDS	SAMPLE ID	Sample #	Instr. Level Result (mg/l)	PDS Recovery (%)	Diluted Result (mg/l)	Diluted Recovery (%)	MSA Result (if needed) (mg/l)	Final Result Reported
	AQ-1	MCCD00	1.6	124				undetected
	AQ-10 (dup AQ-1)	MCCD02	0.6	96.0				undetected
	AQ-2	MCCD01	1.6	113				undetected
	AQ-blank (blank)	MCCD03	-0.3	87.0	DF=1x 1.0	90.0		undetected
88.6	SUB-1	MCCD04	11.6	91.0				2.6 mg/kg
85.7	SUB-10	MCCD06	11.0	97.0				2.6 mg/kg
87.4	SUB-2	MCCD05	16.7	94.0				3.8 mg/kg
8	SUB-3	MCCD07	10.3	96.0				2.8 mg/kg
77.5	SUB-4	MCCD08	9.2	87.0				2.4 mg/kg
91.1	SUB-5	MCCD09	-0.5	99.0				undetected
92.4	SUB-6	MCCD10	over cal	—	DF=5x 21.4	114		23.2 mg/kg
64.7	SUB-7	MCCD11	13.3	76.0			r=0.4999 15.08	4.7 mg/kg
89.8	SUB-8	MCCD12	2.9	91.6				0.65 mg/kg
88.8	SUB-9	MCCD13	over cal	—	DF=10x 27.6	104		62.2 mg/kg
76.6	SD-1	MCCD14	16.1	99.0				4.2 mg/kg
75.0	SD-10 (dup SD-1)	MCCD17	20.9	115				5.6 mg/kg
~0.7	S-BACK (off-site background)	MCCD15	3.1	121				0.69 mg/kg
	DUP AQ-1	MCCD00	1.5	124				undetected
87.4	DUP SUB-2	MCCD05	3.4	91.6				0.78 mg/kg
87.4	matrix spike SUB-2	MCCD05	13.2	—				3.0 mg/kg

Calculated result agrees with reported result within 10%

FOR SOLID SAMPLES FINAL RESULT = INSTRUMENT LEVEL (mg/l) × 0.2 × 100% / % SOLIDS

CASE 13852

ELEMENT: THALLIUM

SPIKE RECOVERIES
MCCD00 (AQ): 94.8
MCCD05 (SOLID): 99.0

Spike Recovery Evaluation Form

% SOLIDS	SAMPLE ID	Sample #	Instr. Level Result (mg/l)	PDS Recovery (%)	Diluted Result (mg/l)	Diluted Recovery (%)	MSA Result (if needed)	Final Result Reported
	AQ-1	MCCD00	1.3	100				1.3 mg/l
	AQ-10 (dup AQ-1)	MCCD02	1.9	95.0				1.9 mg/l
	AQ-2	MCCD01	0.3	105				undetected
	AQ-blank (blank)	MCCD03	-0.1	98.0				undetected
88.6	SUB-1	MCCD04	5.6	94.0				1.3 mg/kg
85.7	SUB-10	MCCD06	6.0	98.0				1.4 mg/kg
87.4	SUB-2	MCCD05	2.0	96.5				0.46 mg/kg
8	SUB-3	MCCD07	12.0	97.5				3.2 mg/kg
77.5	SUB-4	MCCD08	3.1	98.0				0.80 mg/kg
91.1	SUB-5	MCCD09	2.2	98.5				0.48 mg/kg
92.4	SUB-6	MCCD10	2.2	96.0				0.48 mg/kg
64.7	SUB-7	MCCD11	5.1	92.5				1.6 mg/kg
89.8	SUB-8	MCCD12	1.4	99.0				0.31 mg/kg
88.8	SUB-9	MCCD13	2.6	100				0.59 mg/kg
76.6	SD-1	MCCD14	12.1	95.0				3.2 mg/kg
75.0	SD-10 (dup SD-1)	MCCD17	12.7	92.0				3.4 mg/kg
20.7	S-BACK (offsite background)	MCCD15	2.1	94.5				0.47 mg/kg
	DUP AQ-1	MCCD00	0.7	106				undetected
87.4	DUP SUB-2	MCCD05	1.9	97.6				0.44 mg/kg

FOR SOLID SAMPLES FINAL RESULT = INSTRUMENT LEVEL (mg/l) × 0.2 × $\frac{100\%}{\%\ \text{SOLIDS}}$

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

MCCD00D

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Matrix (water/soil): WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum	200.0	998.5700		1094.7200		9.2		P
Antimony		20.0000	U	20.0000	U			P
Arsenic		61.4000		61.8000		.6		F
Barium		84.4500	B	83.1600	B	1.5		P
Beryllium		1.0000	U	1.0000	U			P
Cadmium		2.0000	U	2.0000	U			P
Calcium		122068.6100		121638.0300		.4		P
Chromium	10.0	23.3200		21.5400		7.9		P
Cobalt		4.0000	U	4.0000	U			P
Copper		211.5000		211.7500		.1		P
Iron		3651.7500		3887.1900		6.2		P
Lead		420.0000		424.0000		.9		F
Magnesium	5000.0	15539.8300		15506.4000		.2		P
Manganese		366.6800		370.0400		.9		P
Mercury		.2000	U	.2000	U			CV
Nickel		10.0000	U	12.3000	B	200.0		P
Potassium		33509.7800		33470.5700		.1		P
Selenium		2.0000	U	2.0000	U			F
Silver		2.0000	U	2.0000	U			P
Sodium		67147.1200		67074.3200		.1		P
Thallium		1.3000	B	1.0000	U	200.0		F
Vanadium		14.7600	B	14.9600	B	1.3		P
Zinc		289.6800		286.1000		1.2		P
Cyanide		10.0000	U	10.0000	U			C

FORM VI - IN

7/88

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

MCCD05D

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Matrix (water/soil): SOIL Level (low/med): LOW

% Solids for Sample: 87.4 % Solids for Duplicate: 85.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum		3822.6270		4138.0252		7.9		P
Antimony		4.5767	U	4.5767	U			P
Arsenic		56.0641		16.7048		108.2	*	F
Barium	45.8	50.3890		51.8719		2.9		P
Beryllium		.6590	B	.6911	B	4.8		P
Cadmium	1.1	.4577	U	3.0732		200.0	*	P
Calcium		34251.0000		36397.4800		6.1		P
Chromium		42.1396		39.5172		6.4		P
Cobalt		3.4416	B	5.9176	B	52.9		P
Copper		291.2082		267.8650		8.4		P
Iron		11013.6010		12257.9010		10.7		P
Lead		226.5446		303.2037		28.9	*	F
Magnesium		9916.9451		12589.0000		23.7	*	P
Manganese		193.0572		253.8810		27.2	*	P
Mercury	.1	.1253		.1144	U	200.0	*	CV
Nickel	9.2	14.0824		12.2540		13.9		P
Potassium		690.3959	B	674.4439	B	2.3		P
Selenium	1.1	3.8215		.7780	B	132.3	*	F
Silver		1.0801	B	20.5446		180.0	*	P
Sodium		112.3822	B	145.9336	B	26.0		P
Thallium		.4577	B	.4348	B	5.1		F
Vanadium	11.4	28.5492		33.0549		14.6		P
Zinc		331.6499		433.7048		26.7	*	P
Cyanide		17.7059		17.8169		.6		C

Silver results estimated in soil samples due to inhomogeneity

FORM VI - IN 7/88

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

AA CRDL Standard Source: CAS-AACRDL

ICP CRDL Standard Source: CAS-ICPCRDL

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum					0		19	
Antimony				120.0	110.51	92.1	105.67	88.1
Arsenic	10.0	10.00	100.0					
Barium					0		0	
Beryllium				10.0	10.50	105.0	10.86	108.6
Cadmium				10.0	8.53	85.3	8.95	89.5
Calcium					0		21.5	
Chromium				20.0	19.79	99.0	19.94	99.7
Cobalt				100.0	99.49	99.5	100.29	100.3
Copper				50.0	48.46	96.9	51.61	103.2
Iron					0		23.2	
Lead	3.0	3.30	110.0		24.3		22.6	
Magnesium					0		0	
Manganese				30.0	30.92	103.1	31.89	106.3
Mercury					—		—	
Nickel				80.0	86.16	107.7	80.83	101.0
Potassium					0		904	
Selenium	5.0	5.40	108.0					
Silver				20.0	16.90	84.5	19.25	96.2
Sodium					280		310	
Thallium	10.0	9.30	93.0					
Vanadium				100.0	99.29	99.3	94.26	94.3
Zinc				40.0	43.23	108.1	44.20	110.5

FORM II (PART 2) - IN

7/88

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

AA CRDL Standard Source: CAS-AACRDL

ICP CRDL Standard Source:

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium	5.0	4.50	90.0					
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

FORM II (PART 2) - IN

7/88

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

AA CRDL Standard Source: CAS-AACRDL

ICP CRDL Standard Source:

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium	5.0	4.10	82.0					
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

FORM II (PART 2) - IN

7/88

(Wed)

(Wed)

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

AA CRDL Standard Source: CAS-AACRDL

ICP CRDL Standard Source:

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium	5.0	5.40	108.0					
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

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2B
CRDL STANDARD FOR AA AND ICP

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

AA CRDL Standard Source: CAS-AACRDL

ICP CRDL Standard Source:

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium	5.0	4.60	92.0					
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

ORIGINAL

U.S. EPA - CLP

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

MCCD02L

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Matrix (soil/water): WATER Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	1949.48		2016.70		3.4		P
Antimony	20.00	U	100.00	U			P
Arsenic							
Barium	108.29	B	111.35	B	2.8		P
Beryllium	1.01	B	5.00	U	100.0		P
Cadmium	2.00	U	10.00	U			P
Calcium	121284.48		125701.45		3.6		P
Chromium	25.77		18.75	B	27.2		P
Cobalt	4.00	U	20.00	U			P
Copper	360.18		374.70		4.0		P
Iron	6183.94		6470.45		4.6		P
Lead	420		411.5				P
Magnesium	15550.97		15727.00	B	1.1		P
Manganese	433.80		455.35		5.0		P
Mercury							
Nickel	15.63	B	50.00	U	100.0		P
Potassium	32472.88		33013.10		1.7		P
Selenium							
Silver	2.00	U	10.00	U			P
Sodium	65129.55		65065.20		.1		P
Thallium							
Vanadium	20.20	B	15.00	U	ok 100.0		P
Zinc	370.71		397.75		7.3		P

FORM IX - IN

7/88

U.S. EPA - CLP

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

MCCD15L

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	19646.83		20138.55		2.5		P
Antimony	20.00	U	100.00	U			P
Arsenic							
Barium	201.55		209.80	B	4.1		P
Beryllium	3.76	B	7.60	B	102.1		P
Cadmium	2.00	U	10.00	U			P
Calcium	99181.93		102379.05		3.2		P
Chromium	116.70		113.25		3.0		P
Cobalt	44.60	B	52.75	B	18.3		P
Copper	859.87		915.35		6.5		P
Iron	106090.71		111285.15		4.9		P
Lead							
Magnesium	41358.21		42484.65		2.7		P
Manganese	1473.14		1529.70		3.8		P
Mercury							
Nickel	257.81		312.70		21.3		P
Potassium	2790.48	B	5195.40	B	86.2		P
Selenium							
Silver	5.84	B	10.00	U	100.0		P
Sodium	332.44	B	694.80	B	109.0		P
Thallium							
Vanadium	126.97		120.10	B	5.4		P
Zinc	764.35		821.85		7.5		P

Sodium results estimated in this sample

FORM IX - IN

7/88

6948 - 3324 = 730

ORIGINAL (Red)

U.S. EPA - CLP

10
INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

ICP ID Number: TJA-1 Date: 4/15/90

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	20.0	P
Antimony	206.80		60	20.0	P
Arsenic			10		
Barium	493.40		200	1.0	P
Beryllium	313.00		5	1.0	P
Cadmium	288.80		5	2.0	P
Calcium	317.90		5000	10.0	P
Chromium	267.70		10	3.0	P
Cobalt	228.60		50	4.0	P
Copper	324.70		25	2.0	P
Iron	259.90		100	4.0	P
Lead			3		
Magnesium	383.20		5000	50.0	P
Manganese	257.60		15	1.0	P
Mercury			0.2		
Nickel	231.60		40	10.0	P
Potassium	766.50		5000	700.0	P
Selenium			5		
Silver	328.00		10	2.0	P
Sodium	588.90		5000	60.0	P
Thallium			10		
Vanadium	292.40		50	3.0	P
Zinc	213.80		20	2.0	P

Comments:

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

ICP ID Number: Date: 4/15/90

Flame AA ID Number: VARIAN-3

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		
Antimony			60		
Arsenic			10		
Barium			200		
Beryllium			5		
Cadmium			5		
Calcium			5000		
Chromium			10		
Cobalt			50		
Copper			25		
Iron			100		
Lead			3		
Magnesium			5000		
Manganese			15		
Mercury	253.70	BD	0.2	.2	CV
Nickel			40		
Potassium			5000		
Selenium			5		
Silver			10		
Sodium			5000		
Thallium			10		
Vanadium			50		
Zinc			20		

Comments:

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

ICP ID Number: Date: 4/15/90

Flame AA ID Number:

Furnace AA ID Number: VARIAN-4

Analyte	Wave-length (nm)	Back ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		
Antimony			60		
Arsenic	193.70	BZ	10	1.0	F
Barium			200		
Beryllium			5		
Cadmium			5		
Calcium			5000		
Chromium			10		
Cobalt			50		
Copper			25		
Iron			100		
Lead			3		
Magnesium			5000		
Manganese			15		
Mercury			0.2		
Nickel			40		
Potassium			5000		
Selenium	196.00	BZ	5	2.0	F
Silver			10		
Sodium			5000		
Thallium			10		
Vanadium			50		
Zinc			20		

Comments:

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

ICP ID Number: Date: 4/15/90

Flame AA ID Number:

Furnace AA ID Number: VARIAN-5

Analyte	Wave-length (nm)	Back ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		
Antimony			60		
Arsenic			10		
Barium			200		
Beryllium			5		
Cadmium			5		
Calcium			5000		
Chromium			10		
Cobalt			50		
Copper			25		
Iron			100		
Lead	283.30	BZ	3	1.0	F
Magnesium			5000		
Manganese			15		
Mercury			0.2		
Nickel			40		
Potassium			5000		
Selenium			5		
Silver			10		
Sodium			5000		
Thallium	276.80	BZ	10	1.0	F
Vanadium			50		
Zinc			20		

Comments:

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: COLUMBIA ANALYTICAL INC. Contract: 68-D9-0085

Lab Code: COLUMB Case No.: 13852 SAS No.: SDG No.: MCCD00

ICP ID Number: Date: 4/15/90

Flame AA ID Number:

Furnace AA ID Number: VARIAN-2

Analyte	Wave-length (nm)	Back ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		
Antimony			60		
Arsenic			10		
Barium			200		
Beryllium			5		
Cadmium			5		
Calcium			5000		
Chromium			10		
Cobalt			50		
Copper			25		
Iron			100		
Lead			3		
Magnesium			5000		
Manganese			15		
Mercury			0.2		
Nickel			40		
Potassium			5000		
Selenium	196.00	BZ	5	2.0	F
Silver			10		
Sodium			5000		
Thallium			10		
Vanadium			50		
Zinc			20		

Comments:

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PLATE 1

EPA REGION III
SUPERFUND DOCUMENT MANAGEMENT SYSTEM

DOC ID # _____
PAGE # _____

IMAGERY COVER SHEET
UNSCANNABLE ITEM

Contact the CERCLA Records Center to view this document.

SITE NAME Crown Central Petroleum

OPERABLE UNIT 00

SECTION/BOX/FOLDER 1C Box 1 1,001

REPORT OR DOCUMENT TITLE Site Inspection Report

DATE OF DOCUMENT 12/27/90

DESCRIPTION OF IMAGERY oversized four mile radius map

NUMBER AND TYPE OF IMAGERY ITEM(S) 1 map