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R-585-5-6-9

SITE INSPECTION OF OCCIDENTAL CHEMICAL PREPARED UNDER

TDD NOS. F3-8509-06/F3-8611-13
EPA NO. PA-588
CONTRACT NO. 68-01-7346

FOR THE

HAZARDOUS SITE CONTROL DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

NOVEMBER 17, 1986

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY	REVIEWED BY	APPROVED BY
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SECTION 1

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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 Nos. F3-8509-06/F3-8611-13 for the Occidental Chemical Corporation site located in Lower Pottsgrove Township, Montgomery County, Pennsylvania.

1.2 Scope of Work

NUS FIT III was tasked to conduct a site inspection with sampling of the subject site.

1.3 Summary

The Occidental Chemical Corporation site (formerly owned by the Firestone Tire and Rubber Company (FTR)) is situated within a meander loop of the Schuylkill River adjacent to the southeast borough boundary of the city of Pottstown, Pennsylvania. The 250-acre plant occupies an entire meander loop and is therefore bordered on three sides by the river. The disposal site consists of an inactive 17-acre landfill, an active 7-acre landfill, 4 inactive, unlined seepage lagoons, and 2 active, lined lagoons. The entire disposal site was constructed within the 100-year flood plain.

The inactive landfill was begun as an open dump by the original owner and operator, the Jacob's Aircraft and Engine Company (JAEC). JAEC manufactured aircraft engines at this location from 1942 until 1945. During this period, JAEC dumped the cutting oils and metal filings generated from their operation at the inactive landfill site.

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In 1945, FTR purchased the property and began operations as a tire manufacturing facility and a chemical plant, producing polyvinyl chloride (PVC). FTR operated the now inactive landfill from 1945 until 1970 as an open dump, disposing of tires, rubber, refinery wastes, pigments, zinc oxide, sulfur dioxide scrubber wastes, and polyvinyl chloride (PVC) sludge resins. In 1970, the open dump was converted to a landfill operation. According to the preliminary assessment prepared by Mr. Thomas Sheehan, of the Pennsylvania Department of Environmental Resources (PA DER), the landfill received an average of 33 tons per day of refuse, including 4.6 tons per day of scrap PVC resins (see appendix E). During this period, the seepage lagoons received the plant effluent. The solids which settled out, primarily PVC sludge, were periodically dredged from the seepage lagoons and disposed of in the landfill.

In 1974, the use of the four unlined seepage lagoons was halted by the Pennsylvania Department of Environmental Resources Bureau of Water Quality Management. The two lined lagoons were then constructed to receive and pretreat the plant effluent. This effluent was then discharged to the Pottstown Sanitary System for complete treatment.

The volume of materials being landfilled by FTR in 1971 prompted the company to seek permission to expand the landfill. The state of Pennsylvania informed the company that some type of leachate control system would be necessary prior to approval of the new landfill. FTR determined that it would be impractical to line the existing landfill and more expensive to line the proposed landfill than to manipulate groundwater flow in the area as a means of leachate control. Therefore, FTR hired Martin and Martin, Incorporated to conduct a detailed hydrogeologic study at the site. This study included the drilling of 4 deep wells into bedrock and 22 monitoring wells adjacent to the 2 landfills and the 6 lagoons (see appendix B, figure 2, and appendix F).

The results of their hydrogeologic study indicated a recharge connection between the shallow aquifer and the bedrock aquifer. In addition, on-site monitoring wells showed the presence of iron (185 ppm). The continuous pumping of the nine on-site process water wells succeeded in producing a cone of depression which controls the migration of contaminants into the deep aquifer and the Schuylkill River. Therefore, the initiation of a groundwater recovery system to control the migration of contaminants was accomplished by pumping the nine process water wells used during production. Approval for the expansion of the landfill was granted in 1973. Monitoring well nos. 5, 6, 7, and 8 are sampled quarterly. The available well logs for monitoring well nos. 1 to 26, and process water well nos. 1 to 10, can be found in appendix F.

During the summer of 1980, FTR closed the tire manufacturing portion of the facility and, in December of that same year, sold the entire plant to Hooker Chemical, Incorporated. Shortly, thereafter, Hooker Chemical, Incorporated became, in name only, the Occidental Chemical Corporation. Since 1980, Occidental Chemical has continued to manufacture PVC, utilizing the same procedures and techniques used by FTR.

In July 1984, a trichloroethylene (TCE) spill occurred in the vicinity of process water well no. 8. High levels of TCE were detected in well no. 8, with a plume extending toward process water well nos. 5 and 10. Occidental Chemical excavated the contaminated soil and now periodically tests these three wells.

In 1985, Occidental Chemical proceeded to close the inactive landfill. The closure plan, designed by Betz, Converse, and Murdock, Incorporated, was approved by PA DER and was underway at the time of the FIT site inspection.

Contaminants detected in gw at inactive landfill site →

The site inspection, conducted between September 26, 1985 and October 3, 1985, concentrated on the potential contamination of groundwater in the vicinity of the site. The major contaminants detected include vinyl chloride, trichloroethene, and trans-1,2-dichloroethene. The analytical results and quality assurance review of samples collected during this investigation can be found in section 6.0. The toxicological evaluation of the potential impact on human health and the environment is presented in section 7.0 of this report.

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SECTION 2

2.0 THE SITE

2.1 Location

The Occidental Chemical Corporation facility is located within a meander loop of the Schuylkill River approximately 2,000 feet southeast of the borough boundary of Pottstown, Pennsylvania. The site itself is situated behind and to the south of the plant, on the flood plain of the Schuylkill River. The site location can be seen more accurately on the United States Geological Survey (U.S.G.S.) 7.5 minute series, Phoenixville and Pottstown, Pennsylvania quandrangle maps (see appendix B, figure 1). The site coordinates are 40° 13' 34" north latitude and 75° 36' 14" west longitude.

2.2 Site Layout

The Occidental Chemical Corporation site consists of an old, 17-acre, inactive landfill; a new, 7-acre active landfill; 4 inactive, unlined seepage lagoons; and 2 active, lined lagoons. All are constructed on top of the flood plain of the Schuylkill River. The layout of these features of the site are depicted in appendix B, figure 2.

The inactive landfill, which includes a sulfite dump area, lies to the south of the plant. This landfill is approximately 1,700 feet long and ranges from 350 to 650 feet wide. The landfill rises 30 feet above the flood plain.

The active landfill lies to the east of the inactive landfill and is much smaller in size. The active landfill area, including the sedimentation pond, is approximately 1,000 feet long and 300 feet wide. The current fill rises 30 feet above the flood plain, yet covers only 1/3 of the available acreage.

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The four inactive, unlined seepage lagoons lie adjacent to and northeast of the active landfill. The inactive lagoons cover a total area of approximately 3 acres (370 feet square), with each lagoon measuring an estimated 150 feet per side. A five-foot high dike surrounds the lagoons and separates them from one another. These lagoons, when in use, operated in series, with the northernmost lagoon receiving the plant effluent. When the first lagoon reached its holding capacity, an overflow swale, which breached the dike, discharged the effluent in a clockwise direction to the second lagoon. In a similar fashion, the second lagoon discharged to the third and the third to the fourth. The fourth lagoon was a closed basin that received effluent only when the preceeding lagoons reached capacity. The overflow swales maintained a two-foot freeboard, allowing the time necessary for solids to settle out and the aqueous portion of the effluent to seep through the bottom of the lagoons.

The two lined lagoons cover approximately three acres and lie adjacent to and north of the seepage lagoons. The active lagoons are 160 feet wide and 350 feet long and are lined with an impermeable rubber liner. A free board of two feet (minimum) is maintained in these lagoons.

The Occidental Chemical Corporation currently maintains 25 monitoring wells and 9 process wells at the Pottstown plant. The monitoring wells have been located, predominantly, on the flood plain between the disposal sites and the Schuylkill River. The process wells have been more appropriately located near plant operations. The disposal sites lie within 300 feet of the Schuylkill River. The 100-year frequency flood raises the river stage to the point where it floods the bottom of the landfill. This phenomenon has occurred several times in recent years (see appendix B, figures 1 and 2, and appendix F).

2.3 Ownership History

The Occidental Chemical Corporation site was originally owned and operated in 1942 by JAEC. JAEC operated a machine shop for the production of aircraft engines. Various cutting oils and metal filings were generated from this process. These waste materials were dumped into the now inactive landfill.

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In 1945, FTR purchased the property and began operations as a tire manufacturing plant and a chemical plant. The plant produced plastic resins and tires (i.e., PVC). In December 1980, FTR, having closed the tire manufacturing plant six months earlier, sold the entire facility to Hooker Chemical, Incorporated. Soon thereafter, Hooker Chemical, Incorporated changed their name to Occidental Chemical Corporation, the name by which it is known today. The Occidental Chemical Corporation continues to own and operate the Pottstown facility to date.

2.4 Site Use History

The Occidental Chemical Corporation facility at Pottstown was originally used by JAEC for the production of aircraft engines. During this period (1942 until 1945), JAEC dumped cutting oils and metal filings at the old landfill site.

In 1945, FTR purchased the property and operated a tire manufacturing plant and a chemical plant that produced plastic resins (i.e., PVC). FTR landfilled tires, rubber, refinery wastes, pigments, zinc oxide, sulfur dioxide scrubber wastes, and PVC sludge resins. According to the preliminary assessment prepared for this site by Mr. Thomas Sheehan, of PA DER, an average of 33 tons of refuse were landfilled per day. The majority of this waste was factory trash and paper (see appendix E).

However, approximately 4.6 tons per day of PVC scrap resins were also deposited in the landfill. In addition, the PVC sludge, which accumulated in the four inactive lagoons, was periodically dredged and disposed of in the landfill. From 1945 until 1970, the old landfill site was operated as an open dump. In 1970, it was converted to a landfill operation. In 1973, FTR received permission to landfill sulfur dioxide, scrubber wastes, and fly ash at this site. In 1974, the PA DER Bureau of Water Quality Management ordered the use of the four unlined lagoons to be discontinued. The two lined lagoons were constructed during this same year.

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Due to the volume of waste materials being landfilled, FTR sought permission to expand their landfill in 1971. The state of Pennsylvania informed the company that some type of a leachate control system would be necessary for the entire site prior to approval of the new landfill. FTR determined that it would be impractical to line the existing landfill and more expensive to line the proposed landfill than to manipulate groundwater flow in the area as a means to leachate control. Therefore, FTR hired Martin and Martin, Incorporated to conduct a detailed hydrogeologic study at the site. This study resulted in the initiation of a groundwater recovery system, via the pumping of the nine process water wells. Approval for the expansion of the landfill was granted in 1973 by PA DER and an additional seven acres were put into use, with the stipulation that the process water wells be pumped indefinitely.

In December 1980, six months following the closure of the tire manufacturing plant, FTR sold the facility to Occidental Chemical Corporation (formerly Hooker Chemical, Incorporated). Occidental Chemical continues to operate only the PVC manufacturing portion of the facility. The solids in the effluent are filtered out, mixed with fly ash, and disposed of in the active landfill. The resulting effluent receives some modest aeration and pretreatment and is discharged into the borough sanitary system for complete treatment. The company of Betz, Converse, and Murdock designed a closure plan for the inactive landfill. The plan has been approved by PA DER and is nearing completion at this time (see section 2.6).

The Occidental Chemical Corporation experienced a TCE spill (quantity unknown) in July 1984, in the vicinity of process water well no. 8. High levels of TCE were observed in well no. 8; the plume extended toward process water well nos. 5 and 10. Occidental Chemical Corporation agreed to drill corings, excavate the contaminated soil, pump well nos. 5, 8, and 10, and test the wells periodically. The company is phasing out the use of TCE at this facility.

Occidental Chemical Corporation continues to pump their process wells, as stipulated by PA DER in their approval of the new landfill. In light of the TCE spill and the resulting plume, process well nos. 5, 8, and 10 are dedicated to continuous pumping. The remaining process wells are pumped on a rotating basis. At any given time, one well is down for services or repairs.

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2.5 Permit and Regulatory Action History

According to the PA DER preliminary assessment, the Occidental Chemical Corporation operates under two permits. NPDES permit no. PA 0010944 was granted for the effluent outfall to the borough sanitary sewer. Pennsylvania Solid Waste Permit No. 300001 was granted for the on-site industrial landfill.

To date, no known regulatory action has been taken against the Occidental Chemical Corporation site. Apparently, all regulatory requests made by PA DER have been complied with.

2.6 Remedial Action To Date

In 1974, FTR sought to expand their on-site landfill. The state of Pennsylvania informed the company that some type of a leachate control system would be necessary prior to approval of the new landfill. FTR determined that it would be impractical to line the existing landfill and more expensive to line the proposed landfill than to manipulate groundwater flow in the area as a means to leachate control. Therefore, FTR hired Martin and Martin, Incorporated to conduct a detailed hydrogeologic study at the site. This study resulted in the initiation of a groundwater recovery system. The study included the drilling of 4 deep wells into bedrock and 22 monitoring wells adjacent to the 2 landfills and the 6 lagoons.

The results of the hydrogeologic study indicated a recharge connection between the shallow aquifer and the bedrock aquifer. In addition, on-site monitoring wells showed the presence of iron (185 ppm). The continuous pumping of the nine on-site process water wells succeeded in producing a cone of depression, which prevents the migration of contaminants into the deep aquifer and the Schuylkill River. Well nos. 5, 6, 7, and 8 are sampled quarterly for pH, akalinity, iron, sulfates, total chlorides, biological oxygen demand (BOD) 5 day, and chemical oxygen demand (COD). The available well logs for monitoring well nos. 1 through 25 and process water well nos. 1 through 10 can be found in appendix F. Monitoring well nos. 14 and 24 are presently inoperable. These wells are to be redrilled and a new well, no. 27, will be installed near the old landfill.

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Betz, Converse, and Murdock designed a closure plan for the inactive landfill. The plan was approved by PA DER and, in 1985, the old landfill was completely closed out. This closure plan involved the regrading of side slopes, complete coverage with puncture-resistant fabric, complete coverage with an impermeable butyl rubber cover, two feet of cover material, one foot of top soil, and seed. In addition, erosion control barriers have been installed along the entire perimeter of both the active and inactive landfills.

The Occidental Chemical Corporation experienced a TCE spill in July 1984, in the vicinity of process water well no. 8. High levels of TCE were observed in well no. 8; the plume extended toward process water well nos. 5 and 10. Occidental Chemical Corporation agreed to drill corings, excavate the contaminated soil, pump well nos. 5, 8, and 10, and test the wells periodically. The company is phasing out the use of TCE at this facility.

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SECTION 3

3.0 ENVIRONMENTAL SETTING

3.1 Water Supply

There are two municipal water supply systems located within three miles of the Occidental Chemical Corporation site. They are the Pottstown Borough Water Works and the Citizen's Home Utility Water Company.

The Pottstown Borough Water Works draws its water from the Schuylkill River via three surface water intakes located near the town of Stowe, Pennsylvania. These intakes lie approximately five miles upstream from the site. This system supplies water to an estimated 10,000 customers within a service area which includes the towns of Pottstown, Glasgow, Stowe, South Pottstown, Pottstown Landing, Kenilworth, Sanatoga, and the Occidental Chemical plant itself (see appendix G).[1,2,3]

The Citizen's Home Utility Water Company utilizes four sources for their water supply. This system draws water from three wells and a surface water intake to supply water to the towns of Spring City and Royersford, Pennsylvania. One of these sources, a well, is located between Parker Ford and Pennhurst, Pennsylvania, 2.7 miles southwest of the site. The remaining three sources lie outside the three-mile radius. Water from the well is mixed with water from all other sources and distributed throughout the system. The Citizen's Home Utility Water Company system serves 7,632 persons who reside outside the 3-mile radius of the Occidental Chemical Corporation site.[4]

The balance of the three-mile radius utilizes private wells. The number of people using private wells is estimated to be 6,890 persons.[1,4] The nearest well is 1,100 feet west of the site.[5]

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3.2 Surface Waters

The Occidental Chemical Corporation site is situated within a meander loop on the 100-year flood plain of the Schuylkill River. The disposal sites lie an estimated 300 feet from the river at its closest point. The Schuylkill River, utilized for both a drinking water source and a recreational resource, flows in a southeastwardly direction through the city of Philadelphia, Pennsylvania, eventually converging with the Delaware River. There are no surface water intakes for municipal drinking water supplies within three miles of the site.[1,4]

3.3 Geology and Soils

Lying within the Triassic Lowlands Physiographic Province, the Occidental Chemical site (including the lagoon and landfill area) is constructed within flood plain alluvial deposits. Beneath this cover of consolidated material, sedimentary formations of the Newark Group, specifically the Brunswick and Stockton Formations, are mapped.

The Brunswick Formation has been mapped as the bedrock type located beneath the site. Composed of fine-grained rocks, including reddish-brown shale, siltstone, and mudstone, thin beds of green and brown shale may be encountered locally. Near the base of the formation, a tough, thick-bedded red argillite is found, interbedded with the dark gray argillite of the Lockatong Formation. The total thickness of the Brunswick is estimated to be 16,000 feet near Pottstown, Pennsylvania.[5,6,7]

Due to the mode of deposition, lateral changes in lithology take place within the formation; lithologies of the Brunswick have been emplaced in a series of overlapping and lens-shaped beds, which are discontinuous in all directions. However, individual lenses may extend for several thousand feet along strike. Bedding generally possesses an approximate dip of 20 degrees to the north and northwest.[5,6]

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Joint systems have been developed in many of the beds within the Brunswick Formation. These orientations have been identified; all are nearly vertical. An average distance of six inches between joints is reported. Two interbeds of the Lockatong Formation traverse the plant site. Lying stratigraphically below the Brunswick, the Lockatong consists of a medium to dark gray argillite (very dense shale and mud stone) interbedded with thin beds of gray to black shale, siltstone, and mud stone. Bedding is principally massive within the formation, dipping an average of 20 degrees to the northwest. Fractures that exist in the Lockatong are narrower and more widely spaced than those found in the Brunswick.[5,6]

Overlying the above formations is a cover of alluvium generated by the Schuylkill River. Consisting of thin layers of silt, sand, and gravel, these sediments are reported to be up to 25 feet thick on site.[7]

Soil series identified on site included two types of "Made Land" (MeB and Mb) and the Rowland silt loam (Ru). Test pits on site indicate that the minimum thickness of the soil, to horizons containing 60 percent or more coarse fragments, is 120 inches. Percolation rates, as reported in the Soil Survey of Montgomery County, Pennsylvania, are indicated as variable for those areas indicated as Made Land and range from 4.44×10^{-4} to 4.44×10^{-3} centimeters per second (.63 to 6.3 inches per hour) for the Rauland silt loam.[7]

3.4 Groundwaters

The numerous monitoring and pumping (process) wells located on site have allowed for an understanding of the local groundwater regime. As a result of pump testing, two distinct, yet interdependent, hydrogeologic settings are better understood.[7,8]

Within the alluvial deposits, the primary porosity and permeability inherent to these unconsolidated sediments allow for free movement and storage of groundwater. Within this material, water-table levels tend to correlate closely with river stage; little hydraulic gradient exists here and shallow flow is towards the river.[7,8]

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In contrast, the primary porosity found in the bedrock aquifer is small. Groundwater flow and storage occurs largely via secondary porosity features (joints, fractures, etc.) and along bedding plane surfaces. The nearly verticle joint planes, which cross each other at various angles, are the most important openings for groundwater movement and storage. While the average distance between joints in most sets is about six inches, the number and width of the joints does differ from bed to bed in the Brunswick. As such, some beds will yield more water to wells than others. The situation is similar in the Lockatong, yet here the fractures are narrower and more widely spaced.[6,7,8]

Four monitoring wells have been drilled into the bedrock aquifer, in order to evaluate the response of the flow system located there to pumpage of the well field. In addition, numerous shallow wells monitor conditions in the upper alluvial flow system. Hydrologic studies involving pump testing indicate that, not only can the bedrock flow system be affected by pumping, but responses by several of the alluvial observation wells was noted as well. While most of the shallow monitoring wells respond to precipitation and river stage, pump testing indicates a limited flow system. In general, the alluvial deposits act as a recharge source for the underlying bedrock aquifer.[7,8]

Interconnection between the two is also noted as a result of the deep aquifer's response to river stage. It is reported that this response is carried out via the alluvial deposits but may also result from a direct connection through bedrock outcrop in the river bed.[7,8]

3.5 Climate and Meteorology

The Occidental Chemical Corporation site experiences prevailing westerly winds which produce a humid-continental type of climate. The temperature ranges between winter and summer are relatively wide. Variations in temperature from day to day are common due to weather systems, which alternately bring in warm air from the south and cold air from the north.

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The summer months (June through October) are generally hot and humid; a maximum temperature of 90°F can be expected on an average of 25 days. The average monthly temperature throughout the year ranges from 32°F in January to 77°F in July, with an average annual temperature of 57°F.

The average annual total precipitation is slightly more than 42 inches and is generally well distributed throughout the year. The average net precipitation for the year is approximately 14 inches. The difference in the normal amounts of precipitation between the wettest month (August) and the driest month (October) is about two inches.[10]

3.6 Land Use

Land use in the immediate vicinity of the Occidental Chemical Corporation site ranges in use from urban to rural/agricultural. The city of Pottstown lies immediately to the north and west of the site and maintains a typical mixture of urban, commercial, and industrial land use.

Numerous industries and small businesses are established along the banks of the Schuylkill River, which bisects the target area in a northwest-southeast direction. The balance of the three-mile radius is rural in nature, with a modest degree of agricultural land use.[1]

3.7 Population Distribution

The target area within 3 miles of the subject site has an estimated 31,720 residents. The largest population center is the city of Pottstown, which had a population of 22,729 in 1980.[11] The site is situated adjacent to the southeast borough boundary of Pottstown. Several other small towns and villages are disbursed throughout the target area. They include Pottstown Landing, Parker Ford, Kenilworth, and Sanatoga, with populations that vary from 250 persons to 800 persons, respectively. The population within a 1-, 2-, and 3-mile radius is 1,551, 13,247, and 31,720 persons, respectively.[1]

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3.8 Critical Environments

According to the United States Fish and Wildlife Service, no critical habitats or endangered species are known to exist within a three-mile radius of the subject site.[12]

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3.9 References

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2. Chester County Planning Commission. Chester County Water Systems Inventory. Pottstown and Phoenixville, Pennsylvania, Quadrangle Maps, 7.5 Minute Series. 1984. (See appendix G.)

3. Montgomery County Planning Commission. Water Service Plan. An element of the Montgomery County comprehensive plan. 1979. (See appendix G.)

4 NUS Corporation, FIT III. Hazard ranking system for Occidental Chemical Corporation. TDD No. F3-8602-31, April 30, 1986.

5. Newport, Thomas G., Commonwealth of Pennsylvania Department of Environmental Resources. Groundwater Resources of Montgomery County, Pennsylvania. Water Resources Report 29, 1971.

6. Longwill, Stanley M., and Charles R. Wood, Commonwealth of Pennsylvania Department of Internal Affairs. Ground-Water Resources of the Brunswick Formation in Montgomery and Berks Counties, Pennsylvania. Geologic Survey Bulletin W22, 1965.

7. Martin and Martin, Incorporated and Todd Giddings and Associates. Report to PA DER on Hydrogeology of the Existing Landfill, Proposed Landfill, and Sludge Lagoons. The Firestone Tire and Rubber Company, Pottstown, Pennsylvania, 19464. September 1979, revised October 1975.

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8. Martin and Martin, Incorporated and Todd Giddings and Associates. Groundwater Module Phase II, Firestone Landfill. The Firestone Tire and Rubber Company, Lower Pottsgrove Township, Montgomery County. November 1976.

9. McGreevy, Laurence J., and Ronald A. Sloto, United States Geological Survey. Groundwater Resources of Chester County, Pennsylvania. Open File Report, 1977.

10. United States Department of Agriculture, Soil Conservation Service. Soil Survey for Montgomery County. April 1967.

11. Rand McNally and Company. Commercial Reference Map and Guide for Pennsylvania. 1983.

12. Kulp, Charles, J., United States Fish and Wildlife Service, to Garth Glenn, NUS FIT III. Correspondence. April 21, 1986.

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SECTION 4

4.0 WASTE TYPES AND QUANTITIES

The Occidental Chemical Corporation site was begun under the ownership of JAEC. JAEC operated a machine shop for the production of aircraft engines from 1942 until 1945. During this time, they disposed of cutting oils and metal filings at the old landfill site.

In 1945, FTR purchased the property and operated a tire manufacturing plant and a chemical plant. The plant produced plastic resins (i.e., PVC). FTR landfilled tires, rubber, refinery wastes, pigments, zinc oxide, sulfur dioxide, scrubber wastes, and PVC sludge resins. According to the preliminary assessment prepared for this site by Mr. Thomas Sheehan, of PA DER, an average of 33 tons of refuse were landfilled per day. The majority of this waste was factory trash and paper. Included within this quantity of waste were approximately 4.6 tons per day, or 67,200 tons over the 40-year operational life of the landfill, of PVC sludge resin disposed of in the on-site landfill.

In addition, the PVC sludge, which accumulated in the four inactive lagoons, was periodically dredged and disposed of in the landfill. In 1973, FTR received permission to landfill sulfur dioxide, scrubber wastes, and fly ash at this site. In 1974, the PA DER Bureau of Water Quality Management ordered the use of the four unlined lagoons to be discontinued. The two lined lagoons were constructed during this same year. The solids are filtered off the effluent and disposed of in the on-site landfill. The effluent is modestly pretreated and discharged to the borough sanitary system for complete treatment.

The Occidental Chemical Corporation experienced a TCE spill (quantity unknown) in July 1984, in the vicinity of process water well no. 8. High levels of TCE were observed in well no. 8; the plume extended toward process water well nos. 5 and 10. Occidental Chemical Corporation agreed to drill corings, excavate the contaminated soil, pump well nos. 5, 8, and 10, and test them periodically. The company is phasing out the use of TCE at this facility.

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SECTION 5

5.0 FIELD TRIP REPORT

5.1 Summary

NUS FIT III staff members Richard Callahan, Thomas Pearce, Scott Renneisen, Robert Howell, and David Side conducted a site inspection of the subject site on Thursday, September 26, 1985. Access for the site inspection was granted by Mr. Joseph King, of the Occidental Chemical Corporation. FIT III had difficulty in obtaining samples from the selected monitoring wells because of the regional drought situation (i.e., the low river stage). This difficulty extended the site inspection into a second day of sampling. Heavy rains and severe winds on Friday, September 27, 1985 postponed the work to the following week. The second day of sampling was rescheduled for Thursday, October 3, 1985. Both sampling days were overcast, with light to moderate precipitation and a temperature of approximately 45°F. Alterations to the approved sampling plan include the following:

- Of the seven shallow monitoring wells selected for sampling, monitoring well nos. 5, 7, 8, 19, and 24 were dry and well nos. 13, 17, 21, and 26 were sounded and found to be dry as well. Monitoring well nos. 15 and 18 were damaged in such a way that would not permit sampling. Thus, only two shallow monitoring wells were sampled, instead of the seven that were originally planned.

- Monitoring well no. 25 was sampled in lieu of well no. 5.

- The dedicated pump for process well no. 5 was out of service, which prevented FIT III from collecting a sample.

- The sedimentation pond for the active landfill was dry; therefore, no aqueous sample was collected.

- The old landfill was totally involved in the implementation of the approved closure plan, which involved two feet of cover graded in appropriate slopes, total coverage with a puncture-resistant fabric, total coverage with a butyl rubber liner, and total coverage with topsoil and seed. In addition, erosion-control barriers had been installed along the entire perimeter of both the active and inactive landfills. Therefore, no areas of ponded water were present along the toe of the landfill, which would permit sampling.

- A background soil sample was not collected due to the lack of a compatible soil type which would offer an acceptable means of comparison. In this case, a compatible background soil sample would have been from an unaffected, unaltered portion of the flood plain, located near the site. Such an area did not exist.

5.2 Persons Contacted

5.2.1 Prior to Field Trip

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Number PA - 588 TF3-8611-13

5.3 SAMPLE LOG

Site Name OCCIDENTAL CHEMICAL + NK.

TRAFFIC REPORTS c	Inorganic	High Hazard	SAMPLING LOCATION	PHASE	SAMPLE DESCRIPTION	DATE	TIME	pH	COMMENTS/OBSERVATIONS	ORGANIC / INORGANIC LABORATORY
-69	MCD-011		MW 25	AQ		10/3/85	1200	—		NUS PITTSBURG CHEMTECH
	MCD-012		MW 25 - FILTER	AQ		10/3/85	1200	—		CHEMTECH
70	MCD-013		MW 6	AQ		9/26/85	1350	—		GSRI CAL. ANAL.
—	MCD-014		MW 6 - FILTER	AQ		9/26/85	1350	—		CAL. ANAL.
76	MCD-025		SMW2	AQ		9/26/85	1005	—		GSRI CAL. ANAL.
	MCD-026		SMW2-FILTER	AQ		9/26/85	1005	—		CAL. ANAL.
77	MCD-027		RW 1	AQ		9/26/85	1200	—		GSRI CAL. ANAL.
—	MCD-028		RW 1 - FILTER	AQ		9/26/85	1200	—		CAL. ANAL.
78	MCD-029		RW 2	AQ		9/26/85	1340	—		GSRI CAL. ANAL
	MCD-030		RW 2 - FILTER	AQ		9/26/85	1340	—		CAL. ANAL.
79	MCD-031		RW 3	AQ		10/3/85	1200	—		NUS. PITTS. CHEMTECH
	MCD-032		RW 3 - FILTER	AQ		10/3/85	1200	—		CHEMTECH
80	MCD-033		RW 4	AQ		9/26/85	1545	—		GSRI CAL. ANAL.
	MCD-034		RW4 - FILTER	AQ		9/26/85	1545	—		CAL. ANAL.
81	MCD-035		SED POND	SOL		9/26/85	1440	—		GSRI CAL. ANAL.
83	MCD-037		SL 1	SOL		9/26/85	1550	—		GSRI CAL. ANAL.
84	MCD-038		SL 2	SOL		9/26/85	1615	—		GSRI CAL. ANAL.
86	MCB-650		PW 8	AQ		10/3/85	1300	—		NUS. PITTS CHEM. TECH.
87	MCB-651		PW 10	AQ		10/3/85	1330	—		NUS. PITTS. CHEM. TECH.
91	MCB-655		BLANK	AQ		9/26/85	1330	—		GSRI CAL. ANAL.

AR 100528

= MONITORING WELL - SHALLOW PW = PROCESS WATER WELL
= ROCK WELL - DEEP
= SEEPAGE [redacted]OON
V = SULFI[redacted]ONITORING WELL

umber F3-8[redacted]-21 /F3-8611-13

umber PA - 508

5.3 SAMPLE LOG

Site Name OCCIDENTAL CHEMICAL INC

	TRAFFIC REPORTS Inorganic	TRAFFIC REPORTS High Hazard	SAMPLING LOCATION	PHASE	SAMPLE DESCRIPTION	DATE	TIME	pH	COMMENTS/OBSERVATIONS	LABORATORY
	MCC-382		BLANK - FILTER	AQ		9/26/85	1330			GSRI CAL. ANAL
2	MCC-386		BLANK	SOL		9/26/85	1300			GSRI CAL. ANAL.
4	MCC-394		DUP SED POND	SOL		9/26/85	1440			GSRI CAL. ANAL.
1	MCD-015		BLANK	AQ		10/3/85	1530			NUS. PITTS CHEM TECH
	MCD-016		BLANK - FILTER	AQ		10/3/85	1530			CHEM TECH.

EPA 0526

5.4 Site Observations

- A background HNU reading of 0.6 ppm was recorded. No HNU readings above background levels were registered anywhere on site.

- The old landfill was in the process of being properly closed. This closure involved the placement of a puncture-resistant barrier, an impermeable butyl rubber liner, two feet of cover, topsoil, and grass seed.

- The material in the new landfill was primarily black.

- A sedimentation pond was observed adjacent to the east end of the new landfill. This pond was dry during the site inspection.

- The area between the site and the river consisted of a damp, wooded creek bottom (i.e., the flood plain of the Schuylkill River).

- The four abandoned lagoons were readily visible and covered with vegetation.

AR100530

F3-8509-06/F3-8611-13

EPA

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

I. IDENTIFICATION
01 STATE: PA | 02 SITE NUMBER: 588

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Occidental Chemical Corporation	Armand Hammer Boulevard				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Pottstown	PA	19464	Montgomery	091	PA05

09 COORDINATES: 40° 13' 34" N | 75° 36' 14" W

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
9/26/85 - 10/3/85 (MONTH DAY YEAR)	☒ ACTIVE ☒ INACTIVE	1942 (BEGINNING YEAR) Continuous to date ☐ UNKNOWN (ENDING YEAR)

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☒ 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 C. Callahan	Environmental Engineer	NUS	(215)687-9510
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO**
Thomas Pearce	Environmental Technician	NUS	(215)687-9510
Scott Renneisen	Geologist	NUS	(215)687-9510
Robert Howell	Environmental Technician	NUS	(215)687-9510
David Side	Geologist	NUS	(215)687-9510
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Joseph King	Manager Envirn. Compliance	Occidental Chemical Armand Hammer BLVD.	(215)327-6400
Arthur Schmeck	Environ. Engineer	Pottstown, PA 19464 "	(215) 327-6400
Luke Lukowiac	Environ. Engineer	"	(215)327-6400
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	8:30 - 5:00	Overcast, light precipitation, 45 - 50°F.

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Laura Boornazian	EPA	(215 597-9800

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Richard C. Callahan	EPA	NUS	(215) 687-9510	5 / 6 / 86 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

AR100531

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
PA	588

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- X A. SOLID
- X B. POWDER, FINES
- X C. SLUDGE
- E. SLURRY
- X F. LIQUID
- G. GAS
- D. OTHER (Specify): _____

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

- TONS: 67,200
- ~~CUBIC YARDS~~ XXXXX: over 40
- ~~NO. OF DRUMS~~ XXXXX: years

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

Unknown

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	67,200	tons	PVC sludge/resin waste and
OLW	OILY WASTE			associated wastes over forty years
SOL	SOLVENTS			of operational life
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

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
	trichloroethene	79-01-6	spill and seepage lagoon	18,000	mg/kg
	trans-1,2-dichloroethene	156-59-2	landfill and seepage lagoon	5.5×10^5	mg/kg
	vinyl chloride (PVC)	75-01-4	landfill and seepage lagoon	4.2×10^5	mg/kg
	chromium	7440-47-3	landfill	70	mg/kg

V. 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 III site inspections dated September 26, 1985 and October 3, 1985
PA DER 1980 preliminary assessment.

EPA FORM 2070-13(7-81)

AR100532

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
PA	588

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 14,522
02 [X] OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Sample results from NUS FIT III site inspections of September 26, 1985 and October 3, 1985, show contamination of groundwater with poly vinyl chloride TCE, trans-1,2-dichloroethene and chromium. Population potentially affected could be as high as 14,522. See HRS for this site F3-8602-31 and section 3.1 of this report.

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: unknown
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential - not identified

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Not expected

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Site is located on a meander loop of the Schuylkill River and entrance to the property is via a guard station.

01 [X] F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) [X] POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Sample results from NUS FIT III site inspections of September 26, 1985 and October 3, 1985 show contamination (see 3, II-A above) of the disposal areas which are built on top of the flood plain and unlined - soil contamination is likely - depth unknown.

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

Not identified by sampling. The potential exist for any nearby drinking water supply wells.

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Not expected

01 ☐ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Not expected

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION
01 STATE: PA | 02 SITE NUMBER: 588

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

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

Not expected

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

Not expected

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

Unknown

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

NA - A portion of the site has received full closure while berms and runoff barriers surround the rest. The site is unlined.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

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

N/A

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

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

None

III. TOTAL POPULATION POTENTIALLY AFFECTED: potentially 14,522 via groundwater

IV. COMMENTS

The old, inactive landfill has been covered in 1985, with a puncture resistant cover, a butyl rubber cover , 2 feet of earthen cover, topsoil and seed.

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

NUS FIT III site inspections of September 26, 1985 and October 3, 1985

EPA FORM 2070-13 (7-81)

AR100534

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
PA	588

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	PA 0010944	unknown		
☐ B. UIC				
X C. AIR	unknown	unknown		
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
X G. STATE (Specify) solid waste	300001	unknown	unknown	Industrial landfill
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
X A. SURFACE IMPOUNDMENT	unknown	
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
X F. LANDFILL	140 tons per month of PVC resin	
☐ G. LANDFARM		
☐ 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) None

05 OTHER

☐ A. BUILDINGS ON SITE
Plant adjacent to site.

06 AREA OF SITE

30 (Acres)
of a 250 acre property

07 COMMENTS

None

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one) Moderate to poor

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

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

Old landfill - is unlined but now covered with an impermeable cover

Seepage lagoons and new landfill - unlined but surrounded by earthen berm

New lagoons are lined.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES X NO

02 COMMENTS

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

NUS FIT III site inspections of September 26, 1985 and October 3, 1985
PA DER preliminary assessment - 1980

EPA FORM 2070-13 (7-81)

AR100535

EPA

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

I. IDENTIFICATION
01 STATE: PA | 02 SITE NUMBER: 588

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL
COMMUNITY	A. ☐	B. ☒
NON-COMMUNITY	C. ☐	D. ☒

Within 3 miles

02 STATUS	ENDANGERED	AFFECTED	MONITORED
	A. ☐	B. ☐	C. ☒
	D. ☐	E. ☐	F. ☐ unknown

03 DISTANCE TO SITE
A. 2.65 (mi)
B. 1,100 feet (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) ☐ D. NOT USED, UNUSEABLE

Wells within 3 miles of site
02 POPULATION SERVED BY GROUND WATER 14,522
03 DISTANCE TO NEAREST DRINKING WATER WELL 1,100 feet west (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
5.8 (ft)	south	5.8 (ft)	unknown (gpd)	☒ YES ☐ NO

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

Nearest wells are on-site monitoring wells (4 deep - 120 feet into bedrock and 21 shallow) and 9 process water wells. (276 to 494 feet deep).

10 RECHARGE AREA		11 DISCHARGE AREA	
☒ YES ☐ NO	COMMENTS	☒ YES ☐ NO	COMMENTS Groundwater flows radially from site to the river vertually no gradient.

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)
Within 3 miles - river used for recreation and industry
☒ 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
Schuylkill River	☐	300 feet
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN
A. ONE (1) MILE OF SITE: 1,551 NO. OF PERSONS
B. TWO (2) MILES OF SITE: 13,247 NO. OF PERSONS
C. THREE (3) MILES OF SITE: 31,720 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION
NW 4,000 feet to Pottstown
SW 1,100 feet to nearest well

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
Approximately 3,486

04 DISTANCE TO NEAREST OFF-SITE BUILDING
1,100 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)

Population within 1 mile is 1,551 persons rural. Densely populated to the northwest, the site lies within 4,000 feet of Pottstown, Pennsylvania city limits.

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
PA	588

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ 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)

☐ 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 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
86 (ft)	unknown (ft)	unknown	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE		
		SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
14 (in)	2.6 (in)	4.3 %	south	2.6 %

09 FLOOD POTENTIAL

SITE IS IN 100 YEAR FLOODPLAIN

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

11 DISTANCE TO WETLANDS (5 acre minimum) N/A

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species) N/A _____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS	
	nearest home	PRIME AG LAND	AG LAND
A. 300 feet (mi)	B. 1,100 feet (mi)	C. unknown (mi)	D. 2,000 feet (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is situated on a meander loop of the Schuylkill River. The top of the landfill rises to the elevation of the plant (30 feet above the flood plain). Off-site terrain consists of gently rolling hills.

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

NUS FIT III site inspection of September 26, 1985 and October 3, 1985

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
PA	588

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	9	Organic - Gulf South Research Institute: 9/26/85	1/17/86
SURFACE WATER		Inorganic - CAL analytical 9/26/85 NUS Pittsburgh 10/3/85 Chemtech 10/3/85	
WASTE	3	GSRT- 9/26/85 CAl analytical 9/26/85	1/17/86
AIR		NUS Pittsburgh 10/3/85, Chemtech 10/3/85	
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
HNU	Background 0.6 parts per million No readings above background
Mini-alert	No readings above background

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

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

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS: NUS Corporation report

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

None

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

NUS FIT III Site Inspections of September 26, 1985 and October 3, 1985

EPA FORM 2070-13 (7-81)

AR100538

EPA

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

I. IDENTIFICATION
01 STATE: PA | 02 SITE NUMBER: 588

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	04 SIC CODE
Occidental Chemical Corp		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE / 07 ZIP CODE
Armand Hammer BLVD	Pottstown	PA / 19464
N/A		
N/A		
N/A		

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	11 SIC CODE
N/A		
10 STREET ADDRESS (P.O. Box, RFD #, etc.)	12 CITY	13 STATE / 14 ZIP CODE
N/A		
N/A		
N/A		

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	04 SIC CODE
Hooker Chemical		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE / 07 ZIP CODE
Armand Hammer BLVD	Pottstown	PA / 19464
N/A		
N/A		
N/A		

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

01 NAME	02 D+B NUMBER	04 SIC CODE
N/A		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE / 07 ZIP CODE
N/A		
N/A		
N/A		

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

NUS FIT III site inspections of September 26, 1985 and October 3, 1986
PA DER preliminary Assessment 1980

EPA FORM 2070-13 (7-81)

AR100539

EPA

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

I. IDENTIFICATION
01 STATE: PA | 02 SITE NUMBER: 588

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER	04 SIC CODE
Occidental Chemical Corp.		

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE	07 ZIP CODE
Armand Hammer BLVD	Pottstown	PA	19464

08 YEARS OF OPERATION	09 NAME OF OWNER
1980 - present	same

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER	13 SIC CODE
N/A		

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	14 CITY	15 STATE	16 ZIP CODE

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

01 NAME	02 D+B NUMBER	04 SIC CODE
Firestone Tire and Rubber Company		

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE	07 ZIP CODE
now Firestone BLVD. (Armand Hammer BLVD)	Pottstown	PA	19464

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD
1945-1980	Same

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER	13 SIC CODE
N/A		

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER	04 SIC CODE
Jacobs Aircraft and Engine Company		

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE	07 ZIP CODE
Firestone BLVD	Pottstown	PA	19464

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER	13 SIC CODE
N/A		

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER	04 SIC CODE
N/A		

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER	13 SIC CODE
N/A		

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	14 CITY	15 STATE	16 ZIP CODE

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

NUS FIT III site inspection of September 26, 1985 and October 3, 1985

PA DER preliminary assessment 1980

EPA FORM 2070-13 (7-81)

AR100540

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
PA	588

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
Occidental Chemical Corporation	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**
Armand Hammer BLVD	
05 CITY	**06 STATE** / **07 ZIP CODE**
Pottstown	PA / 19464

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
N/A		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**
N/A		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**

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
N/A		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**
N/A		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**

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

NUS FIT III site inspections of September 26, 1985 and October 3, 1985
PA DER preliminary assessment 1980

EPA FORM 2070-13 (7-81)

AR100541

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
PA	588

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 7/84 — 03 AGENCY by company
04 DESCRIPTION
A TCE spill near process well no. 8 taken off site.

01 ☒ E. CONTAMINATED SOIL REMOVED — 02 DATE 7/84 — 03 AGENCY by company
04 DESCRIPTION
A TCE spill near process well no. 8 taken off site.

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

AR100542

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
PA	588

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

N/A

01 ☒ S. CAPPING/COVERING — 02 DATE ~~October 1985~~ — 03 AGENCY ~~by company~~
04 DESCRIPTION

A complete closure of the old landfill was under way during site inspection (impermeable cover)

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

None

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

NUS FIT III site inspections of Septmeber 26, 1985 and October 3, 1985
PA DER Preliminary Assessment 1980

EPA FORM 2070-13 (7-81)

AR100543

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
PA	588

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

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

None

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

NUS FIT III site inspections of September 26, 1985 and October 3, 1985
PA DER preliminary assessment 1980

EPA FORM 2070-13 (7-81)

SECTION 6

AR100545

6.0 LABORATORY DATA

6.1 Sample Data Summary

GLOSSARY

Data Summary Footnotes

In the data summary which follows, data qualifier code letters are associated with these definitions:

◇	This concentration reported by laboratory, but evidence to doubt presence of compound/element (may or may not be present).
J	Approximate value; detected below limit of accurate quantitation.
[ ]	Value is greater than or equal to the instrument detection limit, but less than the contract required reporting limit.
UF	The material was analyzed for, but was not detected. The associated numerical value is the estimated sample quantitation limit.
F	The associated numerical value is an estimated quantity because quality control criteria were not met. (See Quality Assurance Review for specifics as to magnitude or direction of variability or bias.)
R	Quality Control indicates that data are unusable (compounds may or may not be present). Resampling and/or reanalysis is necessary for verification.
N	Evidence for presence of material is presumptive (tentative identification).

AR100546

TDD Number F3-8506-21 / F3-8611-13
EPA Number PA-588

SAMPLE DATA SUMMARY
TARGET COMPOUNDS
☒ Organic ☐ Inorganic

Site Name Occidental Chemical
Date of Sample 9-27-85

Solid sample results reported as dry weight.

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: Vinyl chloride	Methylene chloride	Acetone	1,2-Dichloroethane	trans-1,2-dichloroethene	1,1,1-Trichloroethane	Trichloroethene	benzene	Toluene	Ethylbenzene	Styrene	benzoic acid	dimethyl-phthalate	Remarks
CC270	Monitoring Well #6	AQ	µg/L		UF 8.7 ◇												
CC276	Sulfite Monitoring Well #2	AQ	µg/L					3.5 J		3.7 J							
CC277	Rock Well #1	AQ	µg/L	3.9 J	UF 10 ◇	UF 7.9 ◇		8.4		3.9 J	1.9 J					6.0 J	
CC278	Rock Well #2	AQ	µg/L														
CC280	Rock Well #4	AQ	µg/L														
CC281	Pond Sediment	Sed	µg/kg		UF 140 ◇			F 1,100		F 4,000	F 16 J	F 180			F 24,000 J		Medium BNA & Pesticide D.L.s
CC283	Seepage Lagoon #1	Sed	µg/kg	F 4.2x10^5	UF 18,000 ◇	UF 24,000 ◇	F 3,600	F 5.5x10^5		F 16,000		F 13,000	F 1.0x10^5	F 66,000	33,000		Medium BNA, VOA, & Pest D.L.s
CC284	Seepage Lagoon #2	Sed	µg/kg	F 3,400	UF 5,400 ◇	UF 11,000 ◇		F 1.0x10^5		F 8,000		F 1,600	F 950				Medium BNA, VOA, & Pest D.L.s
CC291	Blank	AQ	µg/L		6.6												
CC292	Blank	Sol	µg/kg	Not Analyzed per SMO Instructions													
CC294	DUPLICATE OF Pond Sediment	Sed	µg/kg		UF 110 ◇	UF 220 ◇		F 520		F 980		F 65					Medium BNA & Pesticide D.L.s

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

◇ Denotes results of questionable qualitative significance based upon quality assurance review of data.

Note: 5 aqueous samples under a different case #. QA. for these 5 were performed by CRL.

AR100547

TDD Number F3-8506-21 / F3-8611-13
EPA Number PA-588

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☒ Organic ☐ Inorganic

Site Name Occidental Chemical
Date of Sample 9-27-85

Solid sample results reported as dry weight.

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: butyl benzyl phthalate	di-n-butyl phthalate	bis(2-ethyl-hexyl) phthalate	di-n-octyl phthalate										Remarks
CC270	Monitoring Well #6	AQ	ug/L														
CC276	Sulfite Monitoring Well #2	AQ	ug/L														
CC277	Rock Well #1	AQ	ug/L			13											
CC278	Rock Well #2	AQ	ug/L		UF 6.3 ◊	18											
CC280	Rock Well #4	AQ	ug/L		UF 3.5 ◊												
CC281	Pond Sediment	Sed	ug/kg	F 27,000 J		93,000											Medium BNA & Pesticide D.L.s
CC283	Seepage Lagoon #1	Sed	ug/kg			28,000											Medium BNA, VOA, & Pest D.Ls
CC284	Seepage Lagoon #2	Sed	ug/kg			89,000											Medium BNA, VOA, & Pest D.Ls
CC-291	Blank	AQ	ug/L		4.3 J												
CC292	Blank	Sol	ug/kg	Not Analyzed per SMO Instructions													
CC294	DUPLICATE of Pond Sediment	Sed	ug/kg	F 72,000 J		84,000	J F 12,000										Medium BNA & Pesticide D.Ls

AR010548

For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

denotes results of questionable qualitative significance based upon quality assurance review of data.

Note: 5 aqueous samples under a different case #. QA for these 5 were performed by CRL.

TDD Number F3-8509-06/F3-8611-13
EPA Number PA-588

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

■ Organic ☐ Inorganic

Site Name Occidental Chemical
Date of Sample 10/3/85

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: vinyl chloride	methylene chloride	toluene	total xylenes	trans-1,2-dichloroethene	trichloroethene	dimethyl-phthalate	di-n-butyl-phthalate	bis(2-ethylhexyl)-phthalate				Remarks
CC269	Blanks	AQ	µg/l													
CC271	field blank	AQ	µg/l													
CC279	RW3	AQ	µg/l		3 UJ	0.5 J	0.5 J				2.8 J	2.5 J	9.4 J			
CC286	TW7	AQ	µg/l		890 UJ			730	1500			1.1 J				
CC287	PW10	AQ	µg/l	11				250	190							

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

TDD Number F3-8506-21/F3-8611-13
EPA Number PA-688
CASE 4992

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ☒ Inorganic

Site Name OCCIDENTAL CHEMICAL
Date of Sample 9/27/85

Solid sample results reported as dry weight.

Compounds Detected

Sample Number	Sample Description and Location	Phase	Units	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Remarks
MCD013	MW 6	AQ	UG/L	89580			1463	9.5		17800	138	121	114	141900	21.5◇	28270	
MCD014	MW 6 FILTER	AQ	UG/L	205◇			[35]	[0.4]		10390				[48]◇		[3553]	
MCD025	SULFITE MW	AQ	UG/L	128400		15.9	4151	18.8		86730	173	215	1966	233200	*346	59700	* Accuracy of quantitation of Pb can't be verified
MCD026	SULFITE MW FILTER	AQ	UG/L	205◇			[17]			66700		[35]	[3]◇	365◇		23900	
MCD027	ROCK WELL 1	AQ	UG/L				295			49170	[7]	[15]	34	97750		18010	
MCD028	ROCK WELL 1 - FILTER	AQ	UG/L				[199]			49090				1588		18020	
MCD029	ROCK WELL 2	AQ	UG/L	238◇		12.7	509			46450		[9]		198000	F 67.3	13310	
MCD030	ROCK WELL 2 - FILTER	AQ	UG/L				[98]			41790				[27]◇		13460	
MCD033	ROCK WELL 4	AQ	UG/L	2004			426	[0.8]	5.1	29060	27	72	86		9.3◇	8422	
MCD034	ROCK WELL 4 - FILTER	AQ	UG/L				[18]			21960				[69]◇		7631	
MCD035	SEDIMENTATION POND	SOL	MG/KG	6199		24.0	F 176	[1.6]		F 6929	19	F [7]	20	F 6580	F 17.4	[1098]	
MCD037	SEEPAGE LAGOON 1	SOL	MG/KG	4880						17173	70		[11]◇	2781		[2433]	
MCD038	SEEPAGE LAGOON 2	SOL	MG/KG	7174						28461	54		[7]◇	1826		[1651]	
CB 655	BLANK	AQ	UG/L														

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

◇ Denotes results of questionable qualitative significance based upon quality assurance review of data.

TDD Number F3-8506-21/F3-8611-13
EPA Number PA-588
CASE 4992

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ☒ Inorganic

Site Name OCCIDENTAL CHEMICAL
Date of Sample 9/27/85

Solid sample results reported as dry weight.

Compounds Detected

Sample Number	Sample Description and Location	Phase	Units	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc	Cyanide	Percent Solids (%)	Remarks
MCD 013	MW 6	AQ	UG/L	8168	0.3	179	[3940]			7429			151.6	549			
MCD 014	MW 6 FILTER	AQ	UG/L	200						7000				29	☆		
MCD 025	SULFITE MW	AQ	UG/L	10010	4.0	422	10500			94160			225.3	1005			
MCD 026	SULFITE MW FILTER	AQ	UG/L	3753		48	[3704]			103700				49	☆		
MCD 027	ROCK WELL 1	AQ	UG/L	1473		47	[1299]			22410				84			
MCD 028	ROCK WELL 1 - FILTER	AQ	UG/L	1183			[1274]			23080				[15]	☆		
MCD 029	ROCK WELL 2	AQ	UG/L	659		49				6763			[24.8]	50			
MCD 030	ROCK WELL 2 - FILTER	AQ	UG/L	24			[717]			7499				[6]	☆		
MCD 033	ROCK WELL 4	AQ	UG/L	6036	0.2	80			[3.1]	22630			[23.5]	228			
MCD 034	ROCK WELL 4 - FILTER	AQ	UG/L	250			[1012]			23790				[6]	☆		
MCD 035	SEDIMENTATION POND	SOL	MG/KG	249	0.6		[1757]			[862]			40.2	61		67	
MCD 037	SEEPAGE LAGOON 1	SOL	MG/KG	59	0.6		[1240]			[917]			[3.8]	109		49	
MCD 038	SEEPAGE LAGOON 2	SOL	MG/KG	90			[1681]			[862]				31		51	
MCB 655	BLANK	AQ	UG/L											[7]			

NOTE: For target and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.
[ ] Values of questionable qualitative significance based upon quality assurance review of data.

☆-Analysis not required

AR100551

TDD Number F3-8506-21 / F3-8611-13
EPA Number PA-588
CASE 4992

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ☒ Inorganic

Site Name OCCIDENTAL CHEMICAL
Date of Sample 9/27/85

Solid sample results reported as dry weight.

Compounds Detected

Sample Number	Sample Description and Location	Phase	Units	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Remarks
MCC 382	BLANK-FILTER	AQ	UG/L							[637]				[45]			
MCC 386	BLANK	SOL	MG/KG														
MCC 394	SEDIMENTATION POND-DUPLICATE	SOL	MG/KG	7165		22.7	F 184	[1.9]		F 4035	23	F [10]	25	F 9269	F 62.4	[968]	

AR100552

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

◇ Denotes [illegible] of questionable qualitative significance based upon quality assurance re[illegible] of data.

TDD Number F3-8506-21/F3-8611-13
EPA Number PA-588
CASE 4992

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ☒ Inorganic

Site Name OCCIDENTAL CHEMICAL
Date of Sample 9/27/85

Solid sample results reported as dry weight.

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Vanadium	Zinc	Cyanide	Percent Solids (%)	Remarks
MCC 382	BLANK - FILTER	AQ	UG/L							[535]				[8]	☆		
MCC 386	BLANK	SOL	MG/KG				[928]		[1.5]	[405]				[3]			BOTTLE BLANK
MCC 394	SEDIMENTATION POND - DUPLICATE	SOL	MG/KG	237	0.7		[1758] ◇			[919] ◇			46.0	72		65	

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

◇ Denotes results of questionable qualitative significance based upon quality assurance review of data.

☆ - Analysis not required

APR 1008 53

TDD Number F3-8504-06 / F3-8611-13
EPA Number PA-588

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ■ Inorganic

Site Name Occidental Chemical
Date of Sample 12-3-85

Compounds Detected

Sample Number	Sample Description and Location	Phase	Units	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	MAGNESIUM	Remarks
MCD 012	MW 25 Filtered	AQ	ug/l	3096						15190	13			J 3225		10500	
MCD 016	Blank Filtered	AQ	ug/l	[16]										J 118	5.2		
MCD 032	RW 3 Filtered	AQ	ug/l	[199]			[87]			426900				J 754		11630	
MCD 011	MW 25	AQ	ug/l	47915		90	350	34		38245	525	330	470	J 22300	154	22300	
MCD 015	Blank	AQ	ug/l	[148]										J [95]			
MCD 031	RW 3	AQ	ug/l				915			51600				J 125350	6.8	13330	
MCD 650	Process well 8	AQ	ug/l	[132]						61140	13			J 726		23170	
MCD 651	Process well 9	AQ	ug/l	[199]						54710				J 149		24570	

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

◇ Denotes results of questionable qualitative significance based upon quality assurance review of data.

TDD Number F3-9507-06/F3-8611-13
EPA Number PA-588

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ■ Inorganic

Site Name Occidental/Grunicol
Date of Sample 10-3-95

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: MANGANESE	MERCURY	NICKEL	POTASSIUM	SELENIUM	SILVER	SODIUM	THALLIUM	TIN	VANADIUM	ZINC	CYANIDE	% SOLIDS	Remarks
MCA 012	Field	AQ	ug/l	193		[34]	J [953]			15060		J [34]		131			
MCA 016	Field Blank	AQ	ug/l									J [28]		[19]			
MCA 032	Field	AQ	ug/l	481			J [667]			5271		J [30]		UJ 20			
MCA 011		AQ	ug/l	31610		910	J 21100		J 57			J 540	712	2022			
MCA 015	Blank	AQ	ug/l									J [25]		[8.5]			
MCA 031		AQ	ug/l	3530			J [507]			6845							
MCA 650		AQ	ug/l	1448			J [777]			40550		J [3.5]		[10]			
MCA 657		AQ	ug/l	43			J [665]		J 12	18520		J [1.7]		50			

AR100555

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

6.2 Quality Assurance Review

6.2.1 Organic Data: Lab Case 4992

6.2.1.1 Introduction

The findings offered in this report are based upon a general review of organic analytical data for 10 samples. Four medium-level sediment samples and 6 low-level aqueous samples were analyzed by a single contract laboratory. In particular, blank analysis results, surrogate and matrix spike results, duplicate analysis results, calibrations, target compound matching quality, and tentatively identified compounds were examined in detail. In addition, 5 aqueous samples for this site are addressed in a separate Quality Assurance Review prepared by EPA Region III Central Regional Laboratory under Case 5053.

6.2.1.2 Qualifiers

It is recommended that this data package be utilized only with the following qualifier statements:

- All positive results for methylene chloride, acetone, and di-n-butyl phthalate are questionable.

The aforementioned results were designated questionable because there is evidence to doubt the presence of these compounds at concentrations less than or similar to the levels reported. However, with certain exceptions listed below, it can be assumed that concentrations significantly greater than the levels reported cannot be present.

- All positive VOA results for samples CC283 and CC284 should be considered estimated. In addition, the actual detection limits for other VOA compounds in these samples may be slightly higher than reported. This is particularly true for chlorobenzene.

AR100556

- All positive VOA results for samples CC281 and CC294 should be considered estimated. In addition, the results for benzoic acid in sample CC281, di-n-octyl phthalate in sample CC294, and butylbenzyl phthalate in both samples should be considered estimated.

- The laboratory did not report the presence of vinyl chloride in sample CC277. Further information was requested which has confirmed the presence of this compound at an estimated concentration of 3.9 ug/l. This result has been incorporated into the sample data summary.

- The actual detection limts for alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, heptachlor, and aldrin may be substantially higher than reported (at least 10 times) for sample CC277.

- The reported detection limits for 2-butanone and bromodichloromethane are unreliable and may be substantially higher than reported for all samples.

- The reported detection limits for 4-chloroaniline and benzidine are unreliable and may be substantially higher than reported for samples CC278, CC280, CC281, and CC294.

- The reported detection limits for 4-chloroaniline and 3-nitroaniline are unreliable and may be substantially higher than reported for samples CC283 and CC284.

6.2.1.3 Findings

- Field and/or laboratory blank analysis revealed methylene chloride, acetone, and di-n-butyl phthalate at sufficient concentrations to question all positive results for these compounds. In addition, the laboratory noted that insufficient quantity of field blank CC292 was received to perform complete analysis. Per instructions from SMO, analysis of this blank was canceled.

AR100557

- Low surrogate and matrix spike recoveries were reported of all 3 VOA surrogate compounds and 4 out of the 5 VOA matrix spike compounds in samples CC283 and CC284. The laboratory noted that these solid samples partially dissolved into solution during the methanol extraction procedure. Recovery losses due to matrix absorption probably accounts for the observed low recoveries. As a result, all positive VOA results for these samples were flagged as estimated and the actual detection limits for other VOA compounds may be higher than reported.

- High VOA surrogate recoveries for the compound d_8-toluene in samples CC281 and CC294 are attributable to low internal standard responses from the third internal standard. Erratic area responses from both the second and third internal standards may have affected the quantitative accuracy for trichloroethene, toluene, and benzene in these samples. Further supporting evidence is the fact that very high and erratic recoveries were noted for trichloroethene, benzene, and toluene in the matrix spike and matrix spike duplicate of sample MCC281. Furthermore, additional VOA and BNA results for this field duplicate were flagged as estimated because poor precision was noted.

- Examination of the VOA chromatogram revealed a low-level result for vinyl chloride in sample CC297, but it was not reported. The laboratory has sent the spectrum and a single ion chromatogram which has confirmed this identification.

- Examination of the pesticide chromatogram of sample CC277 revealed a very large interfering peak for the first 5 to 6 minutes. This is the region in the chromatogram that all BHC pesticides, heptachlor, and aldrin would elute if they were present. The laboratory diluted by a factor of 10 and reanalyzed the extract. This dilution was somewhat successful in eliminating the interfering peak, but the reported detection limits for the aforementioned pesticides were not adjusted for this dilution.

AR100558

- Poor relative response factors (below 0.05) were noted for 2-butanone, bromodichloromethane, 4-chloroaniline, 3-nitroaniline, and benzidine in the continuing calibration standards associated with the aforementioned samples.

- Tentatively identified compounds which are not suspected artifacts/contaminants are listed in the support documentation appendix. In particular, Caprolactam^{R} (hexahydro-2H-azepin-2-one) was detected in several of the aqueous samples.

6.2.1.4 Summary

The attached Quality Assurance Review has identified the aforementioned areas of concern. The text of this report has been formatted to address only those problem areas which affect the application of the data to the subject investigation. Documentation of these problems and also any observed areas of contractual noncompliance are included in the attached Support Documentation appendix to this report.

Report prepared by Rock J. Vitale Rock J. Vitale Date: November 17, 1986
(215) 687-9510

AR100559

6.2.2 Inorganic Data: Lab Case 4992

6.2.2.1 Introduction

The findings offered in this report are based on a general review of all available inorganic laboratory data, blank analysis results, matrix spike, laboratory and field duplicate results, calibration data, quantitation of results, and ICP interference results. In addition, 5 aqueous samples for this site are addressed in a separate Quality Assurance Review prepared by EPA Region III Central Regional Laboratory under Case 5053.

6.2.2.2 Qualifiers

It is recommended that this data package be utilized only with the following qualifier statements:

- The results which are qualitatively questionable are listed below:

Constituents	Samples with Questionable Results
aluminum	MCD014, MCB026, and MCD029
copper	MCD026, MCD037, and MCD038
iron	MCD014, MCD026, MCD030, and MCD034
lead	MCD013 and MCD033
potassium	All positive sample results
silver	MCD033
sodium	All positive solid sample results
zinc	MCD014, MCD028, MCD030, MDC034, and MCD038

The aforementioned results were designated questionable because there is evidence to doubt the presence of these constituents at concentrations less than or similar to the levels reported. However, with certain exceptions listed below, it can be assumed that concentrations substantially greater than the levels reported cannot be present.

- The positive result for lead in sample MCD025 cannot be verified as is normally possible with other analytes analyzed by ICP.

AR100560

- The positive results may be slightly higher than reported for calcium and zinc and substantially higher than reported for barium in field duplicates MCD035 and MCC394.

- The reported concentrations of cobalt, iron, and lead in field duplicates MCD035 and MCC394 should be considered estimated.

- The reported concentration of lead in sample MCD029 should be considered estimated.

- The actual detection limits for selenium in samples MCD026, MCD028, MCD030, and MCD034 may be slightly higher than reported. (In addition, it should be noted that higher detection limits have been reported for selenium for samples MCD013, MCD025, MCD027, MCD029, and MCD033.)

6.2.2.3 Findings

- Field and/or laboratory blank analysis revealed the presence of aluminum, copper, iron, lead, potassium, silver, sodium, and zinc at sufficient concentrations to question the aforementioned sample results for these constituents.

- The ICP interference mixture which the laboratory analyzes to monitor spectral effects did not contain lead. As a result, the absence of these effects on the quantitation of lead in sample MCD025 cannot be ruled out.

- The laboratory has reported an "E" next to results for barium, calcium, and zinc in all solid samples. This footnote indicates that an interference was present in the quantitation of these analytes as demonstrated by a serial dilution performed on sample MCD035. After this dilution, a 16 percent higher concentration was obtained for zinc, 20 percent higher for calcium, and 500 percent higher for barium. This interference may only be applicable to this sample and its corresponding field duplicate since these samples appear to be fairly unique in their chemical and physical characteristics.

AR100561

- Analysis of field duplicates MCD035 and MCC394 revealed poor precision for cobalt, iron, and lead. In particular, the coelation coefficient was below acceptable criteria for the quantitation of lead in sample MCC394 (method of standard additions).

- Lead was quantitated by the method of standard additions for sample MCD029. However, the coelation coefficient was markedly below criteria.

- Poor post-digestion spike recoveries were reported for selenium in samples MCD026, MCD028, MCD030, and MCD034. However, it should be pointed out that these recoveries were between 40 and 60 percent. Although these recoveries are contractually acceptable, the reported detection limits may still be affected. (In addition, poor post-digestion spike recoveries (less than 40 percent) were obtained for selenium and necessitated dilution and a 5-fold adjustment in detection limits for samples MCD013, MCD025, MCD027, MCD092, and MCD033.)

- The laboratory chose field blank MCB655 for matrix spiking purposes. The use of a field blank for this purpose does not give a good indication of matrix effects encountered with environmental samples. In addition, it is contractually unacceptable.

6.2.2.4 Summary

The attached Quality Assurance Review has identified the aforementioned areas of concern. The text of this report has been formatted to address only those problem areas which affect the application of the data to the subject investigation. Documentation of these problems and also any observed areas of contractual noncompliance are included in the attached Support Documentation appendix to this report.

Report prepared by Rock J. Vitale (215) 687-9510 Rock J. Vitale Date: November 17, 1986

AR100562

6.2 Quality Assurance Review

6.2.1 Organic Data: Lab Case 5053

6.2.1.1 Introduction

The findings offered in this report are based upon a general review of sample data, blank analyses results, surrogate and matrix spike results, target compound matching quality, and tentatively identified compound results for 5 aqueous samples analyzed by one laboratory.

The attached data summary contains only compounds which were reported as detected in at least one sample. The complete list of compounds analyzed for, their results, and associated detection limits are located as an Appendix.

The data summary contains the following qualifier codes:

U - The material was analyzed for, but was not detected. The associated numerical value is the estimated sample quantitation limit.

J - The associated numerical value is an estimated quantity because quality control criteria were not met.

6.2.1.2 Qualifiers

It is recommended that this data package be utilized only with the following qualifier statements:

° The following results have been qualified as not detected due to blank contamination:

Compound	Samples Affected
methylene chloride	CC279, CC286

° Detection limits for the ABN compounds in sample CC269 may be higher than stated by the laboratory.

° The actual detection limit for pentachlorophenol in sample CC271 may be higher than the reported value.

° The low levels of phthalates detected may be artifacts of common lab contamination.

AR100563

6.2.1.3 Findings

- For sample CC269, none of the three acid surrogates were detected and one B/N surrogate recovery was outside the lower detection limit during the initial analysis. Reanalysis (completed 2 weeks later) had one acid surrogate outside the lower acceptance limit.

- The method of reextraction and calculation for the ABN fraction of sample and CC269 doubled the B/N surrogate recoveries. No negative data impact occurred; actual detection limits for B/N compounds would be lower than the reported values.

- Both matrix spikes of sample CC271 failed to detect pentachlorophenol under proper instrument conditions. A matrix interference may be present.

- Methylene chloride was detected in the lab blank at a sufficient quantity to question the reported values in samples CC279 and CC286. (Note: The high value reported in sample CC286 is due to a dilution factor. The amount detected is less than 10x the reagent blank value.)

6.2.1.4 Summary

This Quality Assurance Review has identified the following areas of concern: possible matrix interference for pentachlorophenol in sample CC271, poor surrogate recoveries in two samples and slight lab contamination with methylene chloride.

Please see the accompanying support documentation appendices for specifics on this Quality Assurance Review.

Report prepared by Diana Pickens Diana G Pickens Date: 12/20/85
(301) 224-2470, FTS 922-3752

AR100564

6.2.2 Inorganic Data Lab Case 5053

6.2.2.1 Introduction

The findings offered in this report are based upon a review of all available sample data, blank results, matrix spike and duplicate analysis results, ICP interference QC, calibration data, and quality assurance documentation.

6.2.2.2 Qualifiers

It is recommended that this data package be utilized only with the following qualifier statements:

° The results which may be qualitatively questionable are listed below:

Constituent	Samples With Questionable Results
Iron	MCD 651
Zinc	MCD 032

° The aforementioned results were designated questionable since there is evidence to doubt the presence of these constituents at any concentration less than or equal to the levels reported. However, it can be assumed that concentrations significantly greater than the levels reported for these samples cannot be present.

° The reported results for tin in sample MCD 015 may not accurately reflect the average concentration for this constituent.

° Actual detection limits for iron, potassium, silver, thallium, and tin may be biased slightly higher than reported. Reported results for iron, potassium, silver and tin may be biased slightly low.

° Elevated detection limits were reported for aluminum, antimony, beryllium, cadmium, chromium, cobalt, copper, nickel, silver, tin, and vanadium in sample MCD 031.

° Reported results for tin in samples MCD 032, MCD 650, and MCD 651 may not accurately reflect the true concentration for this constituent.

AR100565

6.2.2.3 Findings

- Field blank analysis revealed the presence of iron and zinc at concentrations significant enough to question the aforementioned results.
- Duplicate analysis of MCD 015 revealed poor precision for tin (117% RPD).
- Low matrix spike recovery was reported for iron (64%), potassium (70%), silver (58%), thallium (62)%, and tin (59%).
- Sample MCD 031 was analyzed at a 5 x dilution thus effectively raising the detection limits of the aforementioned constituents by a factor of 5.
- Percent recovery of the analytical furnace spike for tin in sample MCD 016 was less than 40% and the sample was not diluted and reanalyzed. Percent recovery of the analytical furnace spike for tin in samples MCD 650 and MCD 651 were >40% and <85%. These samples should have been analyzed by MSA.

6.2.2.4 Summary

This Quality Assurance Review has identified the following areas of concern: poor furnace QC analysis and poor matrix spike recovery.

Please see the accompanying support documentation appendix for specifics on this Quality Assurance Review.

Report prepared by Steve L. Markham: Steve L. Markham Date: 12-19-85
(301) 224-2740, FTS 922-3752

AR100566

SECTION 7

AR100567

7.0 TOXICOLOGICAL EVALUATION

7.1 Summary

No human health hazards are evident at this time. However, the potential for public health endangerment may exist. Results of the limited sampling survey conducted at the Occidental Chemical Company property indicate a continued potential for further degradation of groundwater by the known human carcinogen vinyl chloride and related chlorohydrocarbons. Vinyl chloride was detected at a concentration of 420,000 mg/kg in a sediment sample collected from one unlined seepage lagoon. Other solvent compounds were detected at high concentrations in this as well as another unlined seepage lagoon sediment sample and a pond sediment. The lagoons and pond are enclosed within earthen berms to limit surface runoff. The site, however, is situated on a 100-year flood plain, and a surface water intake for a public water supply is located 3.1 miles downstream.

Two aquifers underlie the site, which are interconnected. Contamination of the deeper bedrock aquifer is confirmed by the identification of trichloroethene (TCE) at 1,500 ug/l in a process well sample, and low levels of vinyl chloride, benzene, and trans-1,2-dichloroethene in several bedrock monitoring wells. Only 2 out of 22 shallow monitoring wells (alluvial aquifer) were sampled due to damage or extremely low water-table levels resulting from seasonal drought conditions. These two samples revealed no measurable levels of organic contaminants.

The major concern with regard to the present extent of groundwater contamination and continued infiltration of carcinogenic pollutants is their possible migration to private home wells. The closest home well is located within several hundred feet of the site, and numerous domestic wells are situated across the Schuylkill River to the south. The compounds of concern are sufficiently mobile in the geohydrosphere to readily migrate with groundwater flow. At this site, this is largely determined by the efficacy of the process well pumping program, in progress, to contain the affected groundwater.

AR100568

The groundwater recovery program has been in continuous effect since the early 1970s; disposal of PVC resin wastes has occurred since 1945. Because many of the carcinogenic chlorinated aliphatic hydrocarbons can be very persistent in groundwater, the possibility of past migration (before 1971) via the bedrock aquifer should also be considered. The possibility of vinyl chloride, TCE, or other contamination of home wells (e.g., along Route 724 and Old Schuylkill Road) cannot be completely dismissed.

In spite of the high levels of vinyl chloride detected in lagoon sediments, inhalation hazards appear to be minimal since no HNU readings above background were noted. Analyses for inorganics showed unremarkable concentrations in all samples examined.

7.2 Support Data

7.2.1 Hydrogeology of the Site

Documentation and additional details concerning the history, site characteristics, geohydrology, and target populations can be found in the Hazard Ranking System model for Occidental Chemical Company (TDD No. F3-8602-31), a preliminary assessment prepared by PA DER (see appendix E), and a 1976 report prepared by consultants (Martin and Martin, Incorporated) to Occidental Chemical Company.[13]

AR100569

7.2.2 Identification of Hazardous Substances

Several toxic solvent compounds were detected at this site. Those that represent the potential for causing greatest risk of harm are those that are carcinogenic, exhibit a high mobility in groundwater regimens, and are also present at high concentrations.[1,2] Thus, compounds such as toluene, which is not carcinogenic and relatively non-toxic, or bis(2-ethylhexyl) phthalate, which is practically immobile, pose inconsequential risks relative to other contaminants. trans-1,2-Dichlorethene was found at high concentrations but is classified in EPA's Group D ranking (not classified as carcinogen; inadequate evidence of carcinogenicity in animal studies).[3] The potential hazards associated with this site are, accordingly, posed by vinyl chloride and trichloroethene. Both are found at high concentrations, both are classified as known or probable human carcinogens, both were found in the bedrock aquifer as well as the seepage lagoon material, and both are very mobile in the geohydrosphere. It may also be noted that trichloroethene can undergo substantial degradation over time (t1/2 of 2.5 years)[4] to yield trans-1,2-dichloroethene which also degrades over time (anaerobically in groundwater) to form vinyl chloride.[5]

7.2.3 Mobility of Vinyl Choride and Trichloroethene

The potential for organic compounds to infiltrate into and migrate with flowing groundwater is defined by a mobility index. This parameter is related to the compound's water solubility, vapor pressure, and the extent to which the chemical partitions (adsorbs and desorbs) between soil or sediment and a water phase (K_{OC}).[6] The mobility index for vinyl chloride is calculated to be 5.54, and for trichloroethene it is 2.71.[6,7] Mobility indexes of five or greater are considered extremely mobile, while those greater than zero are very mobile.*

extremely mobile

*PCB-1260, which is very immobile, has a mobility index of -12.0. Mobility index is defined as follows: $MI = \log \frac{\text{(water solubility x vapor pressure)}}{K_{OC}}$

AR100570

Another manner of expressing migration or infiltration potential is through retardation. This factor relates the water flow (linear sorption and desorption) relative to water flow (e.g., percolation or infiltration velocity)

The retardation factor is defined as:[8]

$$R = 1 + \frac{d\ Koc\ foc}{O}$$

Where:

Koc = water - organic carbon partition coefficient
foc = fraction of organic carbon in soil
d = bulk density of the soil
O = volumetric water content of soil (porosity)

For purposes of illustration, if typical values are assumed: i.e., that the bulk density of soil at the Occidental Chemical site is 1.7 g cc, the average organic carbon content of the soil is 1 percent, and the water content of soil is 40 pecent, the rate of infiltration (migration) of vinyl chloride and trichloroethene can be calculated. For vinyl chloride with a log Koc of 0.91:

$$R_V = 1 + \frac{(1.5)\ (10^{0.91})\ (0.01)}{(0.4)} = 1.35$$

For TCE (with a log Koc of 2.1), the retardation factor is 6.35.[7] That is, the rate of infiltration of trichloroethene in an unsaturated zone from the surface is 6.35 times slower than the rate of infiltrating water, and only 1.35 times slower for vinyl chloride.

Since the net precipitation is estimated as 14 inches per year (section 3.5), which is equivalent to 0.0032 feet per day, it can be estimated that a plume of vinyl choride will infiltrate the unsaturated zone at a rate of 0.0043 feet per day (once it has been leached out of high carbon PVC resins).

AR100571

7.2.4 Toxicity and Carcinogenic Potency

Vinyl chloride has been demonstrated to produce cancer in humans and several species of animals. In humans, exposure to vinyl chloride is associated with angiosarcoma of the liver.[3] The chloroethene compound is mutagenic but not teratogenic.[9] It is classified in EPA's Group A categorization (i.e., sufficient evidence from epidemiological studies). The upper 95 percent bound carcinogenic potency is 2.3 for each mg/kg/day unit.[9] Thus, at a concentration of 0.001 mg in drinking water and assuming ingestion of 2 liters per day for 70 years by a 70-kg (154) adult, the risk of cancer would be 7×10^{-5} (about 1 in 15,000). A concentration of only 0.015 ug/l in drinking water would represent a one in a million excess lifetime cancer risk.[3]

Recently, EPA proposed the following health advisories for vinyl chloride in drinking water: 2,600 ug/l for both 1 and 10 days; and for longer term, 13 and 46 ug/l for the child and adult, respectively.[10] A final Recommended Maximum Contaminant Level (RMCL) of zero has been promulgated.[3] An RMCL is a nonenforceable health goal. A Maximum Contaminant Level (MCL) of 1 ug/l has been proposed.[3] An MCL is an enforceable standard for public water supplies, based on economic, social, feasibility, and health considerations.

Trichloroethene, like vinyl chloride, exhibits DNA binding in short-term test systems and is mutagenic but not teratogenic. TCE has produced liver tumors in mice. Based upon EPA guidelines, EPA's Risk Assessment Forum classified TCE in Group B2 (sufficient animal evidence of carcinogenicity and inadequate human evidence). The International Agency for Research on Cancer (IARC) has concluded that the animal evidence is limited at this time.[12] The evidence for EPA's Category I ranking for TCE is weaker than for the other chemicals in this group.[3]

AR100572

The carcinogenic potency (upper 95 percent confidence limit) for TCE has recently been updated by EPA's Carcinogen Assessment Group and the unit risk is 0.013 for each mg/kg/day.[3] Thus, at a concentration of 0.001 mg/l (i.e., 1 ug/l) in drinking water and assuming daily ingestion of 2 liters by a 70-kg adult, the added risk of developing cancer over a lifetime is estimated to be about 4×10^{-7} (4 in 10,000,000). A concentration of 2.6 ug/l represents the concentration in drinking water corresponding to a 10^{-6} (one in a million) cancer risk (assuming drinking two liters per day is the sole source of exposure).[3,11]

Earlier, in 1980, EPA specified Suggested No-Adverse-Response Levels (SNARLS) of 2,020 ug/l for 1-day and 200 ug/l for 10-day exposures to TCE in drinking water. A noncarcinogenic Adjusted Acceptable Daily Intake (AADI) of 260 ug/l for TCE was suggested by EPA,[11] and later proposed in recent health advisories where only a drinking water exposure level (DWEL) of 260 ug/l was specified.[10]

The final RMCL promulgated for TCE in public water supplies is zero. The proposed MCL is 5 ug/l.[3] The World Health Organization has set a tentative guideline of 30 ug/l.[12]

7.3 Risk Characterization

According to a 1980 preliminary assessment report prepared by the Pennsylvania Department of Environmental Resources (PA DER) (see appendix E), the groundwater recovery pumping has generated a cone of depression and reversed the natural flow of groundwater. The effect reportedly has been the successful containment of contaminated groundwater. It may be noted, as a point of interest, that one of the dedicated process well pumps was out of service at the time of the site inspection.

AR100573

LIST OF SOURCES

1. ICAIR, Life Systems, Incorporated. 1985. Endangerment Assessment Handbook. United States Environmental Protection Agency, Office of Waste Programs Enforcement, Washington, D.C. Contract No. 68-01-7037.

2. ICF Incorporated. 1985. Superfund public health assessment manual. Draft. Washington, D.C.: United States Environmental Protection Agency, Office of Emergency and Remedial Response. Contract No. 68-01-6872.

3. Federal Register, 1985. National Primary Drinking Water Regulations: Volatile Synthetic Organic Chemical, Final Rule and Proposed Rule. Federal Register. Vol. 50, No. 219, Wednesday, November 13, 1985. Rules and Regulations.

4. World Health Organization, 1985. Trichloroethylene: Environmental Health Criteria 50. United Nations Environmental Programme, Geneva.

5. Cline, P.V., and D.R. Vista, 1984. Migration and degradation patterns of volatile organic compounds in: Management of Uncontrolled Hazardous Waste Sites, Fifth National Conference, Washington, D.C. pp. 217-220.

6. Ford, K.L., and P. Gurba. 1984. Methods of determining relative contaminant mobilities and migration pathways using physical-chemical data. The Fifth National Conference on Management of Uncontrolled Hazardous Waste Sites. November 1984, pp. 210-212.

7. Lyman, W.J., W.F. Reehl, and D.H. Rosenblatt. 1982. Handbook of Chemical Property Estimation Methods, Environmental Behavior of Organic Compounds. McGraw-Hill, Incorporated, New York.

8. Enfield, C.G., Carsel, R.F., Cohon, S.F., Phan, T., and Walters, P.M. 1982. Approximating pollutant transport to groundwater. Groundwater 20:711-722.

9. United States Environmental Protection Agency. 1984. Health Effects Assessment for Vinyl Chloride. Office of Emergency and Remedial Response, Environmental Criteria and Assessment Office, Cincinnate, Ohio. Draft.

10. United States Environmental Protection Agency. 1986. FY 85 Health Advisories. Health Advisory Program-Assistance Directory. Office of Drinking Water, Washington, D.C.

11. Federal Register, 1984. National Primary Drinking Water Regulations: Volatile Synthetic Organic Chemicals; Proposed Rulemaking. Part V, 40 CFR Part 141. Federal Register, Vol. 49, No. 114, Tuesday, June 12, 1984. Proposed Rules.

12. World Health Organization, 1984. Guidelines for Drinking Water Quality, Vol. 1, Recommendations. WHO Publications, Geneva.

13. Martin and Martin, Incorporated. 1976. Groundwater module phase II, Firestone Landfill. The Firestone Tire and Rubber Company, Lower Pottsgrove Township, Montgomery County.

Release of vinyl chloride and other contaminants prior to the inception of the process well pumping program may have resulted in degradation of area groundwater that is beyond pumping well influence. As discussed above, vinyl chloride and trichloroethene are very mobile in groundwater regimens. Contamination of the bedrock aquifer is evident, and the continued contamination from the unlined surface lagoons is probable. The carcinogenic potency and weight of carcinogenic evidence render vinyl chloride (and its precursor, TCE) a major pollutant of concern in the environment. Whether a public health hazard currently exists or may potentially exist cannot be ascertained at this time: neither can the possibility be ruled out. An area-wide screening of home wells for VOAs may be one way to provide the necessary information to further characterize this situation.

Prepared by: Kenneth G. Symms
Kenneth Symms, Ph.D., Toxicologist

Date: November 17, 1986

AR100576

APPENDIX A

1. COST CENTER: / ACCOUNT NO.:	REM/FIT ZONE CONTRACT TECHNICAL DIRECTIVE DOCUMENT (TDD)			2. NO.: F3-8509-06
3. PRIORITY: ☐ HIGH ☒ MEDIUM ☐ LOW	4. ESTIMATE OF TECHNICAL HOURS: 180	5. EPA SITE ID: PA-588	6. COMPLETION DATE: 3 wks. after QA	7. REFERENCE INFO.: ☐ YES ☐ NO ☐ ATTACHED ☐ PICK UP
	4A. ESTIMATE OF SUBCONTRACT COST:	5A. EPA SITE NAME: Occidental Chemical Lower Pittsgrove Twp., PA		

8. GENERAL TASK DESCRIPTION: Perform a site inspection of the subject site.

9. SPECIFIC ELEMENTS:

1.) Review background information.
2.) Contact state and local agencies for relevant information.
3.) Sampling to be performed according to approved sampling plan submitted under TDD F3-8506-2.
4.) Coordinate lab analysis. Arrange for site access.
5.) Conduct on and off site inspection and sampling.
6.) Take and ship samples according to standard protocol.
7.) Prepare and submit field trip report due 2 wks. after site inspection.
8.) Perform Quality Assurance Review of lab data. Submit QA'd data summary immediately
9.) Prepare and submit report, include in cover letter recommendations for need of HRS.
10.) All work on this project to be performed according to: WP-SI-1, Rev. 1.

10. INTERIM DEADLINES:

11. DESIRED REPORT FORM: FORMAL REPORT ☒ LETTER REPORT ☐ FORMAL BRIEFING ☐

OTHER (SPECIFY):

12. COMMENTS:

State Code 042 County Code 091

13. AUTHORIZING RPO: Harold G Bryan (SIGNATURE) — 14. DATE: 10/31/85

15. RECEIVED BY: ☒ ACCEPTED ☐ ACCEPTED WITH EXCEPTIONS ☐ REJECTED
(CONTRACTOR RPM ~~SIGNATURE~~) — 16. DATE: 10/04/85

Sheet 1 White – FITL Copy
Sheet 2 Canary – DPO Copy
Sheet 3 Pink – Contracting Officer's Copy (Washington, D. C.)
Sheet 4 Goldenrod – Project Officer's Copy (Washington, D. C.)

APPENDIX B

AR100579

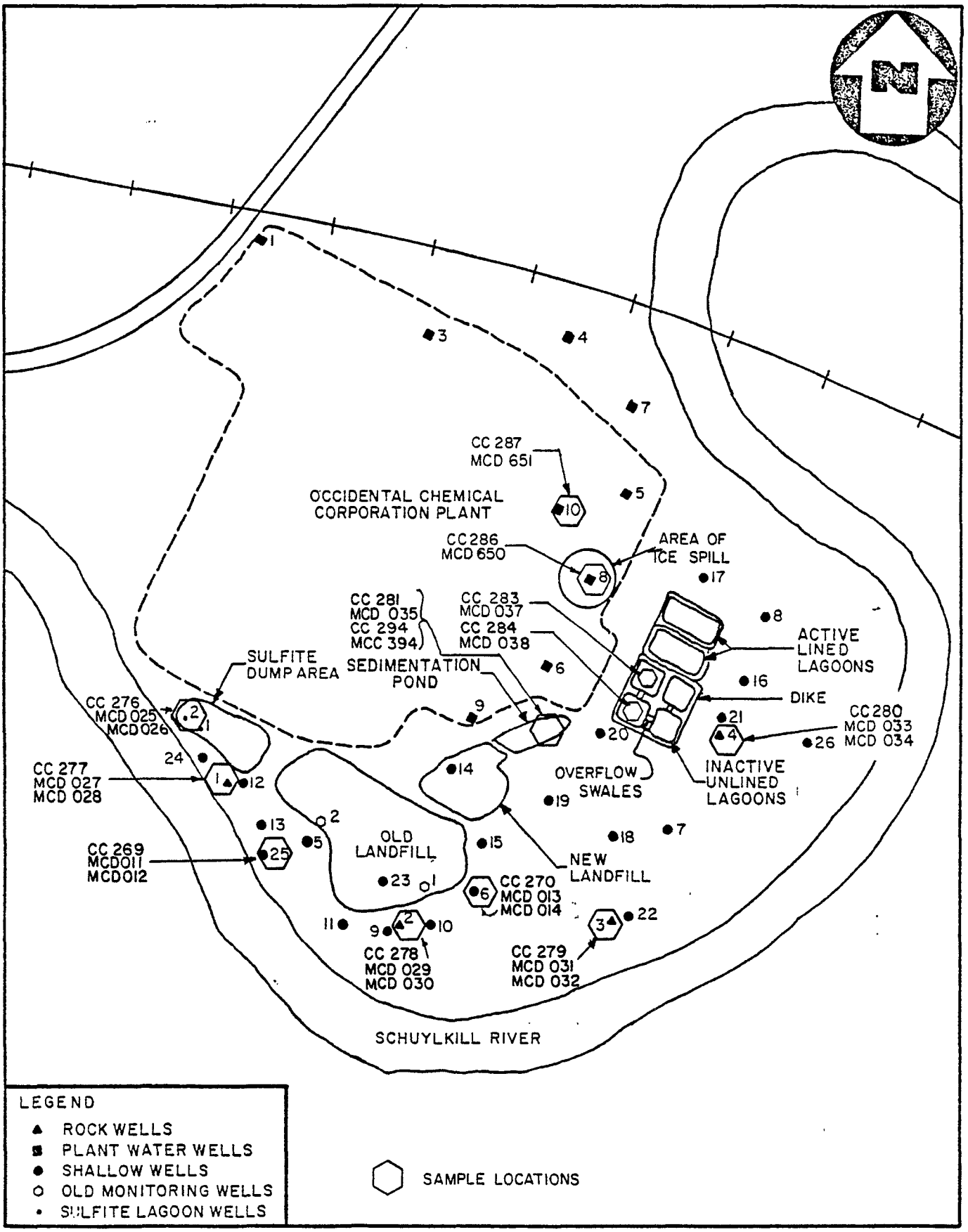


FIGURE 3

SAMPLE LOCATION MAP

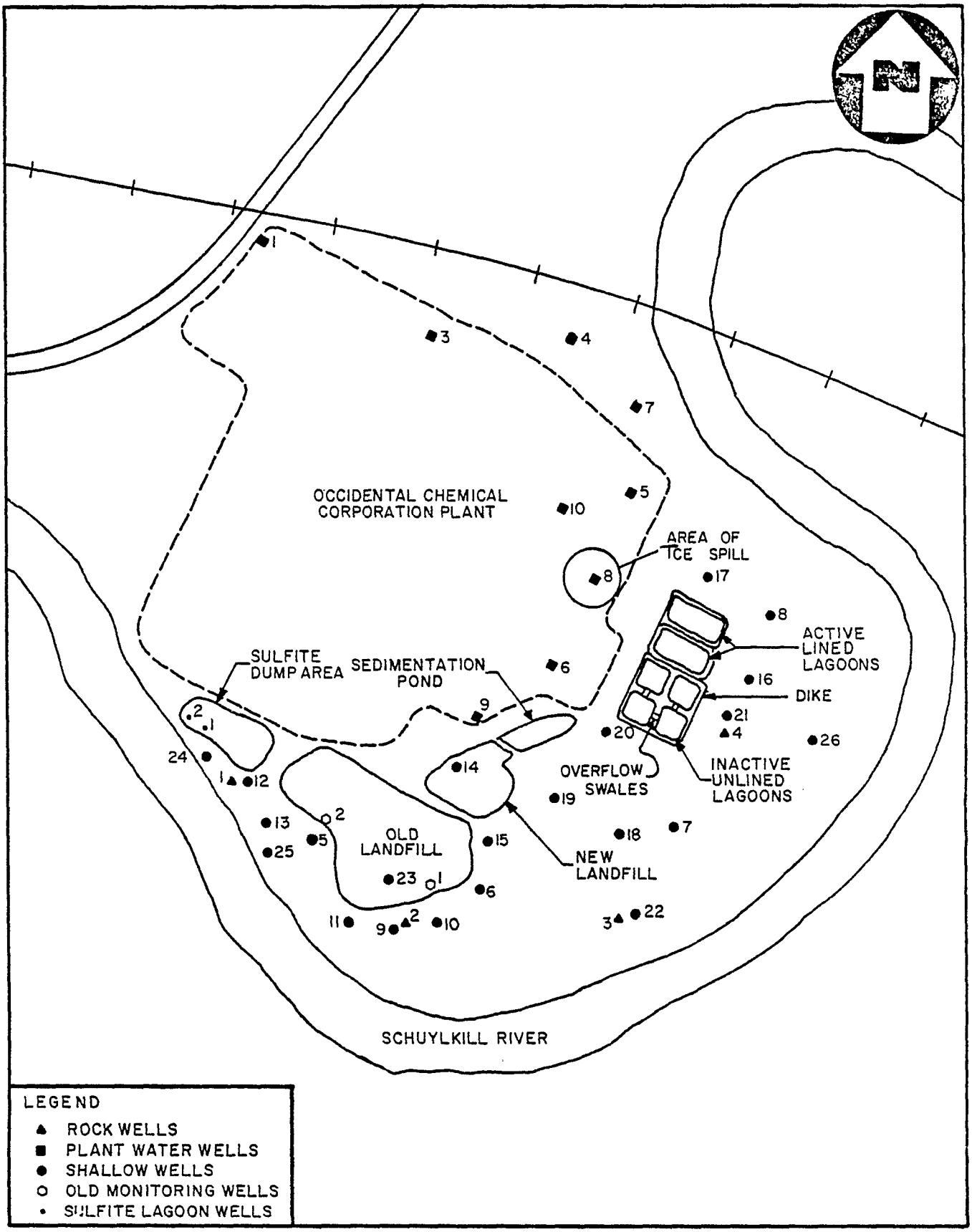
OCCIDENTAL CHEMICAL CORP. SITE, POTTSTOWN, PA.

(NO SCALE)

NUS CORPORATION

A Halliburton C

AR100582



SITE SKETCH

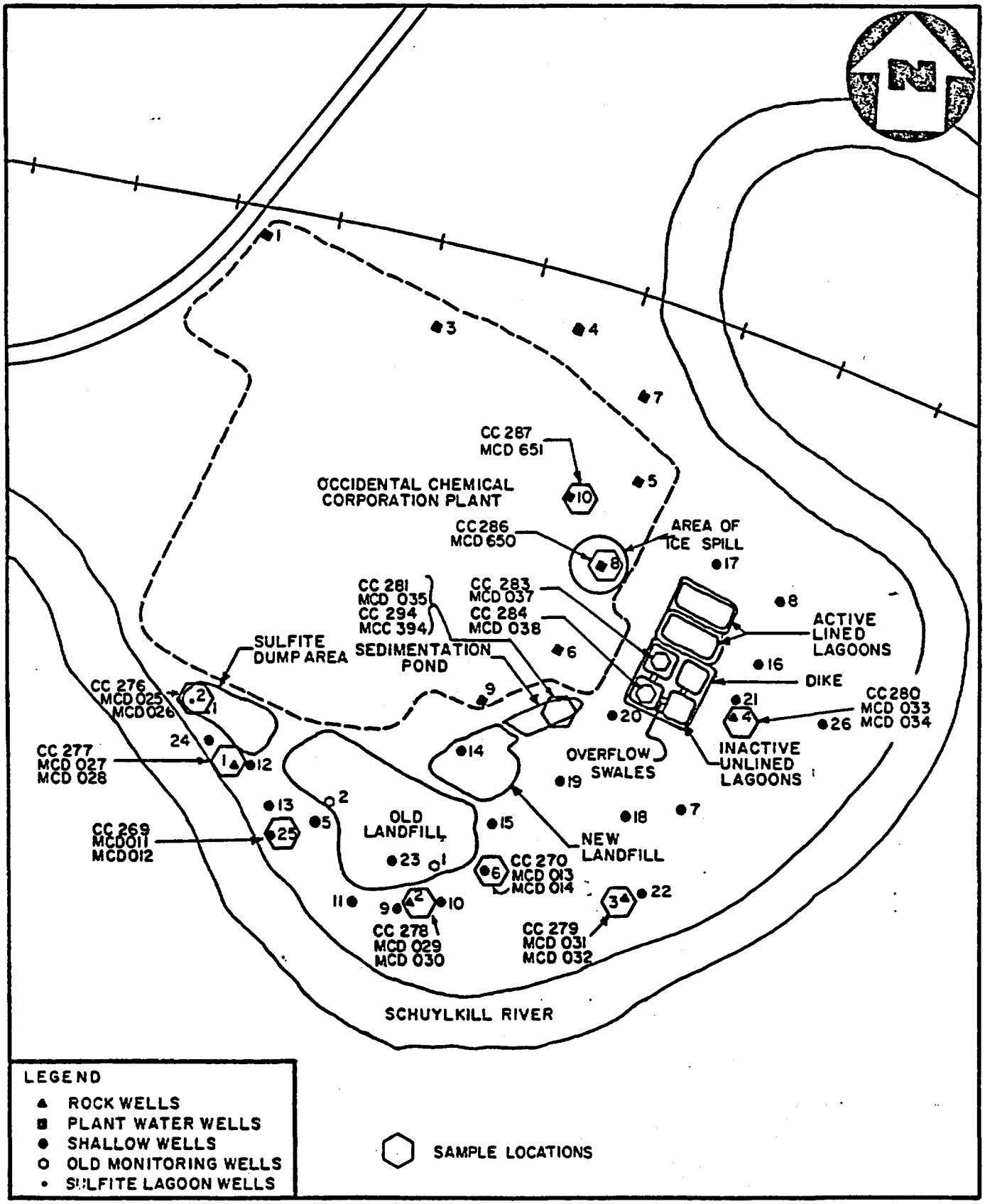
OCCIDENTAL CHEMICAL CORP. SITE, POTTSTOWN, PA.

(NO SCALE)

FIGURE 2

NUS CORPORATION

AR100581



SAMPLE LOCATION MAP

OCCIDENTAL CHEMICAL CORP. SITE, POTTSTOWN, PA.

(NO SCALE)

FIGURE 3

NUS CORPORATION

A Halliburton Company

AR 100582

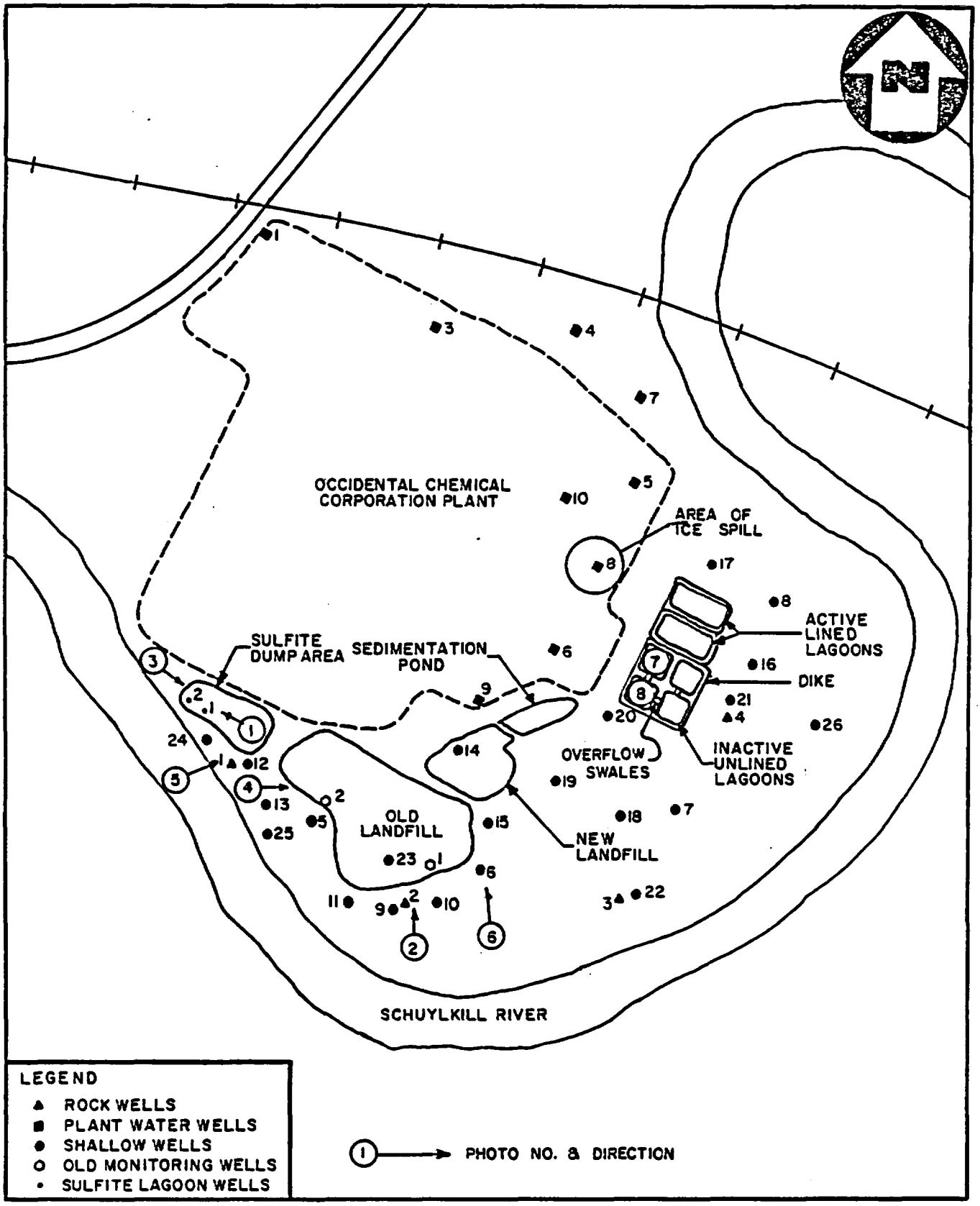


PHOTO LOCATION MAP

OCCIDENTAL CHEMICAL CORP. SITE, POTTSTOWN, PA.

(NO SCALE)

FIGURE 4

NUS CORPORATION

A Halliburton Company

ARTOO583

APPENDIX C

PROJECT NAME: Occidental Chemical
TDD NO: F3-8506-21

EPA SITE NO.:
REGION: F.T III

QUALITY ASSURANCE REVIEW OF ORGANIC ANALYSIS LAB DATA PACKAGE

Case No.: 4992
Contract No.: 68-01-6959
Contract Laboratory: GSRI
Applicable IFB No.: WA84-A267
Reviewer: Rock J. Vitale
Review Date: 1/16/86

Applicable Sample No's.: CC270, CC276, CC277, CC278, CC280, CC281, CC283, CC284, CC291, CC292, CC294.

The organic analytical data for this case has been reviewed. The quality assurance evaluation is summarized in the following table:

Reviewer's Evaluation*	Fraction				
	VOLATILES	ACIDS	BASE/ NEUTRALS	PCB/ PEST.	TCDD
Acceptable					
Acceptable with exception(s)	✓#1, #2, #3, #4, #5, #7	✓ #4-CC	✓#1, #4	✓ #6, #7	Not Analyzed
Questionable					
Unacceptable					

* Definitions of the evaluation score categories are listed on next page.

This evaluation was based upon an analysis of the review items indicated below:

- ● DATA COMPLETENESS
- ● BLANK ANALYSIS RESULTS
- ● SURROGATE SPIKE RESULTS
- ● MATRIX SPIKE RESULTS
- ● DUPLICATE ANALYSIS RESULTS
- ○ EVALUATION OF CONFIRMATIONS
- ≠ ● QUANTITATIVE CALCULATIONS
- ≠ ● TARGET COMPOUND MATCHING QUALITY
- ● TENTATIVELY IDENTIFIED COMPOUNDS
- ● CHROMATOGRAPHIC SENSITIVITY CHECKS
- ≠ ● DFTPP AND BFB SPECTRUM TUNE RESULTS
- ● STANDARDS
- ● CALIBRATION CHECK STANDARDS
- ≠ ● HOLDING TIMES

Data review forms are attached for each of the review items indicated above.

≠ No errors noted, no form attached.

◒ Spot Check performed.

Comments: #1 Please see blank analysis documentation
#2 Please see matrix spike recoveries
#3 Please see surrogate spike recoveries
#4 Please see calculations - high %D - CCC violations, Low RFs - SPCCs
#5 Matrix interferences resulted in erratic internal standard areas for CC283 & CC284 - all estimated.
#6 Many pesticides in MS & MSD were outside established RT windows. Reviewer has examined all chromatograms - No positives detected.
#7 Large interference in first 5 min of pesticide chromatogram of sample CC277
#8 Please see field duplicate analysis results

DATA EVALUATION SCORE CATEGORIES

ACCEPTABLE: Data is within established control limits, or the data which is outside established control limits does not affect the validity of the analytical results.

ACCEPTABLE WITH EXCEPTION(S): Data is not completely within established control limits. The deficiences are identified and specific data is still valid, given certain qualifications which are listed below.

QUESTIONABLE: Data is not within established control limits. The deficiences bring the validity of the entire data set into question. However, the data validity is neither proved nor disproved by the available information.

UNACCEPTABLE: Data is not within established control limits. The deficiences imply the results are not meaningful.

DATA COMPLETENESS	CONC./MATRIX	L/AQ →					W/SOIL	MED/SOIL	MED/SED	L/AQ	W/SOIL
FRACTION	TRAFFIC REPORT # CC2	70	76	77	78	80	81	83	84	91	94
	LAB I.D. # VONT	01	07	12	17	21	26	30	32	36	42
VOA :	RUN DATE/TIME	✓									✓
	TARGET COMPOUND TAB.	✓									✓
	TARGET COMPOUND D.L.	✓									✓
	TENT. I.D. COMPOUND TAB.	✓									✓
	SURROGATE RECOVERY	✓									✓
	GC SCREEN TABULATION	N/R									✓
	GC/MS CHROMATOGRAMS	✓									✓
	TARGET CMPD. QUAN. LIST	✓									✓
	TARGET CMPD. SPECTRA	✓									✓
	TENT. I.D. CMPD. Q.L.	✓									✓
	TENT. CMPD. LIB. SRCH.	✓									✓
	CHRO./SENS. CHECKS	✓									✓
	BFB/~~DFTPP~~ TUNE DATA	✓									✓
	I.S AREAS CHARTS	N/R									✓
	I.S. REL. RESP. FORM	N/R									✓
	RF & AMTS. : CALIB. CHK.	✓									✓
	RF & AMTS. : 3-PT CALIB.	✓									✓
	Chromatograms: Calib. Chk.	✓									✓
	Chromatograms: 3-Pt. Calib.	✓									✓
	LINEARITY : 3-PT. CALIB	✓									✓
	RF COMPARISON	✓									✓
	SAMPLE/FIELD BLANK									✓	
	METHOD/INSTR. BLANK										
	LAB DUPLICATE			✓			✓		✓		
	FIELD DUP/REP						✓ W/94				✓ W/81
	MAT. SPK./M. STD.			✓			✓		✓		

COMMENTS :

DATA COMPLETENESS	CONC./MATRIX											
		10/AQ	→				med/Sol	med/Sol	med/Sol	L/AQ	med/Sol	
FRACTION	TRAFFIC REPORT # CC2	70	76	77	78	80	81	83	84	91	94	
	LAB I.D. # VONT	01	07	12	17	21	26	30	32	36	42	
BNA :	RUN DATE/TIME	✓	→									
	TARGET COMPOUND TAB.	✓	→									
	TARGET COMPOUND D.L.	✓	→									
	TENT. I.D. COMPOUND TAB.	✓	→									
	SURROGATE RECOVERY	✓	→									
	GC SCREEN TABULATION	N/R	→									
	GC/MS CHROMATOGRAMS	✓	→									
	TARGET CMPD. QUAN. LIST	✓	→									
	TARGET CMPD. SPECTRA	✓	→									
	TENT. I.D. CMPD. Q.L.	✓	→									
	TENT. CMPD: LIB. SRCH.	✓	→									
	CHRO./SENS. CHECKS	✓	→									
	~~BFB~~/DFTPP TUNE DATA	✓	→									
	I.S AREAS CHARTS	N/R	→									
	I.S. REL. RESP. FORM	N/R	→									
	RF & AMTS.: CALIB. CHK.	✓	→									
	RF & AMTS.: 3-PT CALIB.	✓	→									
	Chromatograms: Calib. Chk.	✓	→									
	Chromatograms: 3-Pt. Calib.	✓	→									
	LINEARITY: 3-PT. CALIB	✓	→									
	RF COMPARISON	✓	→									
	SAMPLE/FIELD BLANK									✓		
	METHOD/INSTR. BLANK											
	LAB DUPLICATE			✓			✓					
	FIELD DUP/REP											
	MAT. SPK./M. STD.			✓			✓					
PEST. :	PESTICIDE TABULATION	✓	→									
	PEST. D.L. TABULATION	✓	→									
	PESTICIDE CHRO.	✓	→									
	PESTICIDE STD. CHRO.	✓	→									
	PESTICIDE STD. I.D.	✓	→									
	2nd COLUMN CONF.	NO Positives	→									
	GC/MS CONFIRMATION	N/A	→									
	PESTICIDE DUPLICATE			✓			✓					
	PESTICIDE SPIKE			✓			✓					
	PESTICIDE BLANK									✓		
	STD SUMMARY	✓	→									
	LINEARITY CHK.	✓	→									
	DEGRAD. CHK.	✓	→									
	DBC RT SHIFT	✓	→									

KEY TO DATA COMPLETENESS FORM

Abbreviation Used on Form	Description of Checklist Item
Conc./Matrix	Concentration category submitted in analysis request (low, med, hi); and matrix (sol., aq.)
Fraction	Fill in acid, base/neutral, acid/base/neutral, or volatiles analysis
Run Date/Time	Instrument run date (to be used for correlating calibration)
Target Cmpd. Tab.	Tabulated results for target compounds
Target Cmpd. D.L.	Detection limits for target compounds (actual/level indicated by screen
Tent. LD. Cmpd. Tab.	Tabulated results for tentatively identified compounds
Surr. Rec.	Surrogate recoveries results
GC Screen Tab.	Tabulated GC screen results indicating required level of followup
GC/MS Chromatograms	Chromatograms of GC/MS analysis runs
Target Cmpd. Quan. List	Target compounds quantitation list, showing areas, ret. times
Target Cmpd. Spectra	Enhanced and unenhanced spectra of target compound hits
Tent. LD. Cmpd. Q.L.	Quantitation list for tentatively identified compounds
Tent. Cmpd. Lib. Srch.	Spectra and library match spectra of tentatively identified compounds
Chro./Sens. Checks	EICP's and R.R.F.'s for chromatographic sensitivity checks
BFB/DFTPP Tune Data	Spectra intensity lists, and criteria comparison forms for BFB, DFTPP
I.S. Areas Charts	Internal standards area control charts and description of remedial action
I.S. Rel. Resp. Form	Internal standards relative response listings for each sample run
RF and amts.: Calib. Chk.	Tabulated response factors and amount injected for all cmpds. in calibration check
RF and amts.: 3-Pt. Calib.	Tabulated response factors and amount injected for all cmpds. in 3-point calibration
Chromatograms: Calib. Chk.	Chromatograms for calibration check standard
Chromatograms: 3-Pt. Calib.	Chromatograms for 3-point multilevel calibration standards.
Linearity: 3-Pt. Calib.	Tabulated correlation coefficient or relative standard deviation for calibration
RF Comparison	Tabulated comparison of calibration Response Factor with check standard
Sample/Field Blank	Equipment rinse or reagent water blank shipped with samples from field
Method/Instr. Blank	Method or instrument blank which is prepared at lab
Lab Duplicate	Sample which was split by lab for duplicate analysis
Field Dup/Rep	Sample which was split or collected twice in the field
Mat. Spk./M. Std.	Matrix spike or method standard (blind, or done by lab)
Pest. Tab.	Tabulated results for pesticides
Pest. D.L. Tab.	Tabulated detection limits for pesticides
Pest. Chro.	Chromatograms for pesticide screening
2nd Col. Conf.	Confirmation of pesticide results by using a second GC column and temperature
GC/MS Conf.	Confirmation of pesticide results by GC/MS analysis
Pest. Dup., Spk. Blk.	Pesticide duplicate, spike, and blank
Pest. Std. Chro.	Chromatogram of pesticide standard
Pest. Std. LD.	Pesticide standard identification form
TCDD	2,3,7,8-tetrachlorodibenzodioxin
TCDD Tab., D.L., EICP, Blk.	TCDD tabulated results, detection limits, extracted ion current profile, blank

KEY TO SYMBOLS USED IN DATA COMPLETENESS TABLE

Symbol	Meaning	Symbol	Meaning
✓	Data item present	I	Incomplete data item
NA	Data item not applicable or not required	NC	Data item not clearly explained (units of conc., etc)
P	Data item within established control limits		
F	Data item outside established control limits	* or [number]	See footnote
MS	Missing item	XX/XX/XX XX:XX	Date/Time of run (calibration, etc.)

BLANK ANALYSIS RESULTS FOR TARGET COMPOUNDS

FRACTION	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT)
VOA	field/low/AQ			CC291	NUS	$MeCl_2$ (6.6 ug/L / 5) #1 Acetone (7.2 ug/L / 10) #2
BNA	field/low/AQ			CC291	NUS	Di-n-butyl phthalate (4.3 ug/L / 10) #1
Pest	field/low/AQ			CC291	NUS	N.D.
VOA	method/low/AQ			VB100 185B	GSRI	$MeCl_2$ (21 ug/L / 5) #1 Acetone (11.3 ug/L / 10) #2
BNA	method/low/AQ			SVNTW Blk	GSRI	N.D
Pest	method/low/AQ			NT Blk	GSRI	N.D
VOA	method/low/AQ			VB100 285A	GSRI	N.D
VOA	method/low/sol			VB100 285B	GSRI	$MeCl_2$ (5.5 ug/Kg / 5) #2
VOA	hold/low/sol			VB100 385A	GSRI	Acetone (14 ug/Kg / 10) #2 $MeCl_2$ (33 ug/Kg / 10) #1
VOA	meth/med/sol			VB100 385B	GSRI	Acetone (5900 ug/Kg / 500) #1
BNA	meth/med/sol			SVNTS Blk	GSRI	N.D
~~Pest~~	meth/med/sol			NT Blk	GSRI	N.D
VOA	meth/med/sol			VB100 485A	GSRI	$MeCl_2$ (1142 ug/Kg / 500) #2 Acetone (980 ug/Kg / 500) #2

LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHIN THE SAMPLE ANALYTICAL DATA SUMMARY. TENTATIVELY IDENTIFIED COMPOUNDS IN BLANKS ARE LISTED ON A SEPARATE FOF

COMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM QUANTITATION LIST, DIAGNOSTICS, CHROMATOGRAM AND/OR SPECTRA.

Solid field blk not analyzed per SMO instructions

BLANK ANALYSIS RESULTS FOR TENTATIVELY IDENTIFIED COMPOUNDS

ALL TENTATIVELY IDENTIFIED COMPOUNDS FOUND IN BLANK ANALYSES ARE LISTED BELOW:

SAMPLE #	FRACTION	SCAN #(S)	SPECTRUM MATCH INDICES				ESTIMATED CONCENTRATION	COMPOUND NAME	COMMENTS
			TYPE	SCORE	TYPE	SCORE			
CC291	VOA	368					5.0	Hexane	
	BNA	578					6.6	Trichloro-1-propene	
		765					6.6	2-propenyl-cyclohexane	
BLK#1	VOA	368					4.8	HEXANE	
	BNA	579					3.9	trichloro-1-propene	
		765					3.5	2-propenyl-cyclohexane	

AR100591

SOIL SURROGATE PERCENT RECOVERY SUMMARY

Case No. 4992 Contract Laboratory Gulf South Reserach Institute Contract No. 68-01-6959

Low ✓ Medium

	VOLATILE			SEMI-VOLATILE								PESTICIDE
SMO TRAFFIC NO.	TOLUENE-D8 (50-160)	BFB (50-160)	1,2 DICHLORO-ETHANE-D4 (50-160)	NITRO-BENZENE-D5 (20-140)	2-FLUORO-BIPHENYL (20-140)	TERPHENYL-D14 (20-150)			PHENOL-D5 (20-140)	2-FLUORO-PHENOL (20-140)	2,4,6 TRIBROMO-PHENOL (10-140)	DIBUTYL-CHLORENDATE ** (20-150)
CC 281	238 *	[1] 63	87	NR	NR	NR			NR	NR	NR	NR
CC 294	167 *	[1] 63	85									
CC 281MS	291 *	60	93									
CC 281MSD	418 *	52	91									
CC 281R	174 *	[1] 107	88									
CC 294R	146	[1] 84	94						85 fm	84 fm		
BLANK 3	107	104	92									
BLANK 4	111	103	89									

* VALUES ARE OUTSIDE OF CONTRACT REQUIRED QC LIMITS

** ADVISORY LIMITS ONLY

Volatiles: 5 out of 24 ; outside of QC limits
Semi-Volatiles: NR out of NR ; outside of QC limits
Pesticides: NR out of NR ; outside of QC limits

Comments: (VOA) A matrix effect was observed for CC 281 and CC 294 in which the recovery of IS-2 and IS-3 (1,4 difluorobenzene, d5-chlorobenzene) was very low. This caused some erratic results in the surrogate recovery values for VOA's. Refer to case Narrative.

[1] 1,1-TCE, TCE, benzene, toluene in CC281, Tol, ethyl, TCE, in C294 estimated (These compounds were quantitated using the IS2 & IS3-effected IS.)

FORM II 8/84

EB10592

SC" SU" OG..E I ..RCL..T R..OV..Y S..M..Y

Case No. 4992 Contract Laboratory Gulf South Research Institute Contract No. 68-01-6959

Low _____ Medium ✓

	VOLATILE			SEMI-VOLATILE								PESTICIDE
SMO TRAFFIC NO.	TOLUENE-D8 (50-160)	BFB (50-160)	1,2 DICHLORO-ETHANE-D4 (50-160)	NITRO-BENZENE-D5 (20-140)	2-FLUORO-BIPHENYL (20-140)	TERPHENYL-D14 (20-150)			PHENOL-D5 (20-140)	2-FLUORO-PHENOL (20-140)	2,4,6 TRIBROMO-PHENOL (10-140)	DIBUTYL-CHLORENDATE ** (20-150)
CC-281	NR	NR	NR	65	77	63			58	55	58	134
CC-281MS	↓	↓	↓	48	48	69			45	47	50	181 * [2]
CC-281MSD	↓	↓	↓	62	67	68			60	62	66	186 * [2]
CC-283	59	64	53 [1]	79	83	103			77	75	92	75
CC-283MS	62	63	53	NR	NR	NR			NR	NR	NR	NR
CC-283MSD	57	51	52	↓	↓	↓			↓	↓	↓	NR
CC-284	52	52	51 [1]	69	74	83			60	67	68	107
CC-294	~~53~~ NR	~~64~~ NR	~~66~~ NR	53	64	60			45	46	52	135
BLANK5	100	95	82	84	86	96			85	84	86	87
BLANK6	99	103	91	NR	NR	NR			NR	NR	NR	NR

* VALUES ARE OUTSIDE OF CONTRACT REQUIRED QC LIMITS

** ADVISORY LIMITS ONLY

Volatiles: 0 out of 18 ; outside of QC limits

Semi-Volatiles: 0 out of 42 ; outside of QC limits

Pesticides: 2 out of 7 ; outside of QC limits

Comments: [1] All positive VOA results estimated - D.L may be higher for others.
[2] High recoveries for DBC do not impact data

RI00593

WATER SURROGATE PERCENT RECOVERY SUMMARY

Case No. 4992 Contract Laboratory Gulf South Research Institute Contract No. 68-01-6959

	VOLATILE			SEMI-VOLATILE								PESTICIDE
SMO TRAFFIC NO.	TOLUENE-D8 (88-119)	BFB (85-121)	1,2 DICHLORO-ETHANE-D4 (77-120)	NITRO-BENZENE-D5 (41-120)	2-FLUORO-BIPHENYL (44-119)	TERPHENYL-D14 (33-128)			PHENOL-D5 (15-103)	2-FLUORO-PHENOL (23-121)	2,4,6 TRIBROMO PHENOL (10-130)	DIBUTYL-CHLORENDATE** (48-136)
CC 270	100	105	91	81	76	71			77	76	81	70
CC 270	100	104	94	82	79	35			40	81	82	83
CC 277	102	107	88	78	80	70			79	75	87	91
CC 278	103	108	99	87	88	91			88	84	94	147 * ✓
CC 280	102	107	93	80	83	79			80	78	89	77
CC 291	100	100	87	85	85	82			85	81	85	89
CC 277 MS	102	99	85	78	77	72			80	74	86	102
CC 277 MSD	103	112	96	83	79	86			84	79	86	131
BLANK 1	105	101	87	73	65	83			74	71	80	129
BLANK 2	101	104	90	NR	NR	NR			NR	NR	NR	NR

* VALUES ARE OUTSIDE OF CONTRACT REQUIRED QC LIMITS

**ADVISORY LIMITS ONLY

Volatiles: 0 out of 30 ; outside of QC limits

Semi-Volatiles: 0 out of 54 ; outside of QC limits

Pesticides: 1 out of 9 ; outside of QC limits

Comments: Gel OK

BRIOSOF

SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. 4992 **Contractor** Gulf South Research Inst. **Contract No.** 68-01-6959

Low Level _____ **Medium Level** ✓

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug/Kg)	SAMPLE RESULT	CONC. MS	% REC	CONC. MSD	% REC	RPD	QC LIMITS * RPD	QC LIMITS * RECOVERY
VOA SMO SAMPLE NO. CC 283	1,1-Dicholorethene	~~6250~~ 12654	0	9526	75	8138	64	16	22	59-172
	Trichloroethene		160781	22216	48*	20361	34*	34*	24	62-137
	Chlorobenzene		0	6421	51*	6138	48*	6.1	21	60-133
	Toluene		13191[1]	18893	45*	20065	54*	18	21	59-139
	Benzene		0 [1]	7338	58*	6253	49*	17	21	66-142
B/N SMO SAMPLE NO. CC-281	1,2,4-Trichlorobenzene	~~3400~~ 1517	0	73873	49	95179	63	25*	23	38-107
	Acenaphthene	~~3400~~ 551		69767	45	87975	58	25*	19	31-137
	2,4 Dinitrotoluene			59731	39	76395	50	25	47	28-89
	Di-n-Butylphthalate		61220	~~53444~~	40	89411	59	38	47	29-135
	Pyrene			83444	55	92950	61	10	36	35-142
	N-Nitrosodi-n-Propylamine			70636	47	92143	61	26	38	41-126
	1,4-Dichlorobenzene			71941	47	87841	58	21	27	28-104
ACID SMO SAMPLE NO. CC-281	Pentachlorophenol	~~6000~~ 3034		72904	24	116368	38	45	47	17-109
	Phenol			135219	45	179578	59	27	35	26-90
	2-Chlorophenol			151147	50	204596	68	31	50	25-102
	4-Chloro-3-Methylphenol			132694	44	167313	55	22	33	26-103
	4-Nitrophenol			85454	28	127317	42	40	50	11-114
PEST SMO SAMPLE NO. CC-281	Lindane	1200	0	750	63	760	63	1	50	46-127
	Heptachlor			790	66	810	68	2	31	35-130
	Aldrin			830	69	860	72	4	43	34-132
	Dieldrin	3000		1900	57	1800	60	6	38	31-134
	Endrin			2300	77	2400	80	4	45	42-139
	4,4'-DDT			2400	80	2400	80	0	50	23-134

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 1 out of 5 ; outside QC limits
B/N 2 out of 7 ; outside QC limits
ACID 0 out of 5 ; outside QC limits
PEST 0 out of 6 ; outside QC limits

RECOVERY: VOAs 8 out of 10 ; outside QC limits
B/N 0 out of 14 ; outside QC limits
ACID 0 out of 10 ; outside QC limits
PEST 0 out of 12 ; outside QC limits

Comments: high levels of trichloroethene and ~~the~~ on toluene present in samples interfered with matrix spike recoveries for VOA's - Low recoveries of chlorobenzene and benzene most likely related to strong matrix effect. cc 283 was an unusual sample - see case narrative record for details
[1] Confirms logic used for surrogates - TCE, Tol, benzene, estimates - D.L heavy chlorinated solvents & aromatics slightly higher. particularly chlorobenzene

AR10595

SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. 4992 **Contractor** Gulf South Research Inst. **Contract No.** 68-01-6959

Low Level ✓ **Medium Level** _____

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug/Kg)	SAMPLE RESULT	CONC. MS	% REC	CONC. MSD	% REC	RPD	QC LIMITS * RPD	QC LIMITS * RECOVERY
VOA SMO SAMPLE NO. CC 281	1,1-Dicholorethene	316	0	337	107	373	118	10	22	59-172
	Trichloroethene		3998 [L]	4242	77	9579	1133*	175*	24	62-137
	Chlorobenzene		0	271	86	321	102	17	21	60-133
	Toluene		180 [L]	1140	304*	2227	648*	72*	21	59-139
	Benzene		16 [L]	682	211*	723	219*	2.8	21	66-142
B/N SMO SAMPLE NO. NA	1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	23	38-107
	Acenaphthene								19	31-137
	2,4 Dinitrotoluene								47	28-89
	Di-n-Butylphthalate								47	29-135
	Pyrene								36	35-142
	N-Nitrosodi-n-Propylamine								38	41-126
	1,4-Dichlorobenzene								27	28-104
ACID SMO SAMPLE NO. NA	Pentachlorophenol								47	17-109
	Phenol								35	26-90
	2-Chlorophenol								50	25-102
	4-Chloro-3-Methylphenol								33	26-103
	4-Nitrophenol								50	11-114
PEST SMO SAMPLE NO. NA	Lindane								50	46-127
	Heptachlor								31	35-130
	Aldrin				NA				43	34-132
	Dieldrin								38	31-134
	Endrin								45	42-139
	4,4'-DDT								50	23-134

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 2 out of 5 ; outside QC limits
B/N NA out of NA ; outside QC limits
ACID NA out of NA ; outside QC limits
PEST NA out of NA ; outside QC limits

RECOVERY: VOAs 5 out of 10 ; outside QC limits
B/N NA out of NA ; outside QC limits
ACID NA out of NA ; outside QC limits
PEST NA out of NA ; outside QC limits

Comments: (VOA) Large amounts of trichloroethene, toluene, and benzene present in sample background greatly interfered with matrix spike recoveries for VOA's

[L] Confirms logic on matrix spikes as presented for Surrogates - TCE, Tol, then zene fortrates

AR100596

WATER MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. 4992 **Contractor** Gulf South Research Inst. **Contract No.** 68-01-6959

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug/L)	SAMPLE RESULT	CONC. MS	% REC	CONC. MSD	% REC	RPD	QC LIMITS* RPD	QC LIMITS* RECOVERY
VOA SMO SAMPLE NO. CC 277	1,1-Dichloroethene	50	0	56	112	62	124	10	14	61-145
	Trichloroethene	↓	4	45	82	50	92	11	14	71-120
	Chlorobenzene		0	44	88	51	102	15*	13	75-130
	Toluene		↓	48	96	54	108	12	13	76-125
	Benzene	↓	2	46	88	52	100	13*	11	76-127
B/N SMO SAMPLE NO. CC 277	1,2,4-Trichlorobenzene	50	0	27	54	28	56	4	28	39-98
	Acenaphthene	↓	↓	43	86	40	80	7	31	46-118
	2,4 Dinitrotoluene			46	92	44	88	4	38	24-96
	Di-n-Butylphthalate			45	90	44	88	2	40	11-117
	Pyrene			51	102	49	98	4	31	26-127
	N-Nitroso-Di-n-Propylamine			36	72	34	68	6	38	41-116
	1,4-Dichlorobenzene	↓		23	46	24	48	4	28	36-97
ACID SMO SAMPLE NO. CC 277	Pentachlorophenol	100		72	72	68	68	20	50	9-103
	Phenol	↓		79	79	90	90*	13	42	12-89
	2-Chlorophenol			88	88	94	94	10	40	27-123
	4-Chloro-3-Methylphenol			90	90	96	96	6	42	23-97
	4-Nitrophenol	↓	↓	39	39	60	60	42	50	10-80
PEST SMO SAMPLE NO. CC-277	Lindane X								15	56-123
	Heptachlor								20	40-131
	Aldrin X				D				22	40-120
	Dieldrin								18	52-126
	Endrin								21	56-121
	4,4'-DDT								27	38-127

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 2 out of 5; outside QC limits
B/N 0 out of 7; outside QC limits
ACID 0 out of 5; outside QC limits
PEST NA out of NA; outside QC limits

RECOVERY: VOAs 0 out of 10; outside QC limits
B/N 0 out of 14; outside QC limits
ACID 1 out of 10; outside QC limits
PEST NA out of NA; outside QC limits

Comments: PESTICIDE MATRIX SPIKES COULD NOT BE DETERMINED DUE TO MATRIX EFFECTS AND SAMPLE DILUTIONS
True, on the undiluted pesticide analysis of the unspiked sample there is a large interferant but this only in the first 6 min. So endrin, DDT, Dieldrin could have been recovered on an undiluted Spike since these elute after 5 minutes D.L
All single peak pesticides which elute before 5 mins may be substantially higher since lab has not raised the d.L's of these. (All-BHCs, heptachlor & aldrin)

1/85

R10097

Duplicate/Triplicate Analysis of Non-Matrix Spiked (Indigenous) Compounds

Outliers are tabulated below for three types of multiple analyses:

(1) Field duplicates CC281 & CC294

(2) Un-spiked laboratory duplicates

(3) Matrix spike duplicate plus corresponding unspiked sample evaluated for non-matrix spiked (indigenous) compounds. (Spike recoveries are evaluated on a separate form.)

Analytical Fraction	Outlier Criteria (for tabulation purposes only)			
	Relative standard deviation		Equivalent Relative Percent Difference	
	solid	aqueous	solid	aqueous
VOA			25%	
BNA			35%	
PEST			No Positives	

	CONCENTRATIONS						relative standard deviation or relative percent difference	concentration units	footnotes
	Analysis No. 1		Analysis No. 2		Analysis No. 3				
COMPOUND	SAMPLE I.D.	CONC.	SAMPLE I.D.	CONC.	SAMPLE I.D.	CONC.			
$MeCl_2$	CC281	140	CC294	110			24%	ug/kg	#1, #3
Acetone		ND		220			200%		#2, #3
trans-1,2-Cl_2ene		1,100		520			72%		#2
TCE		4,000		980			122%		#2
benzene		16		ND			200%		#2
Toluene		180		65			94%		#2
benzoic Acid		24,000		ND			200%		#2
butyl benzyl phth		27,000		72,000			91%		#2
bis(2EH)phthalate		93,000		84,000			10%		#1
di-n-octyl phthalate	"	ND	"	12,000			200%	"	#2

COMMENTS: #1 Within acceptable criteria

#2 Poor precision (considered estimated).

#3 One or both values questioned due to blk contamination

TENTATIVELY IDENTIFIED COMPOUND SAMPLE RESULTS

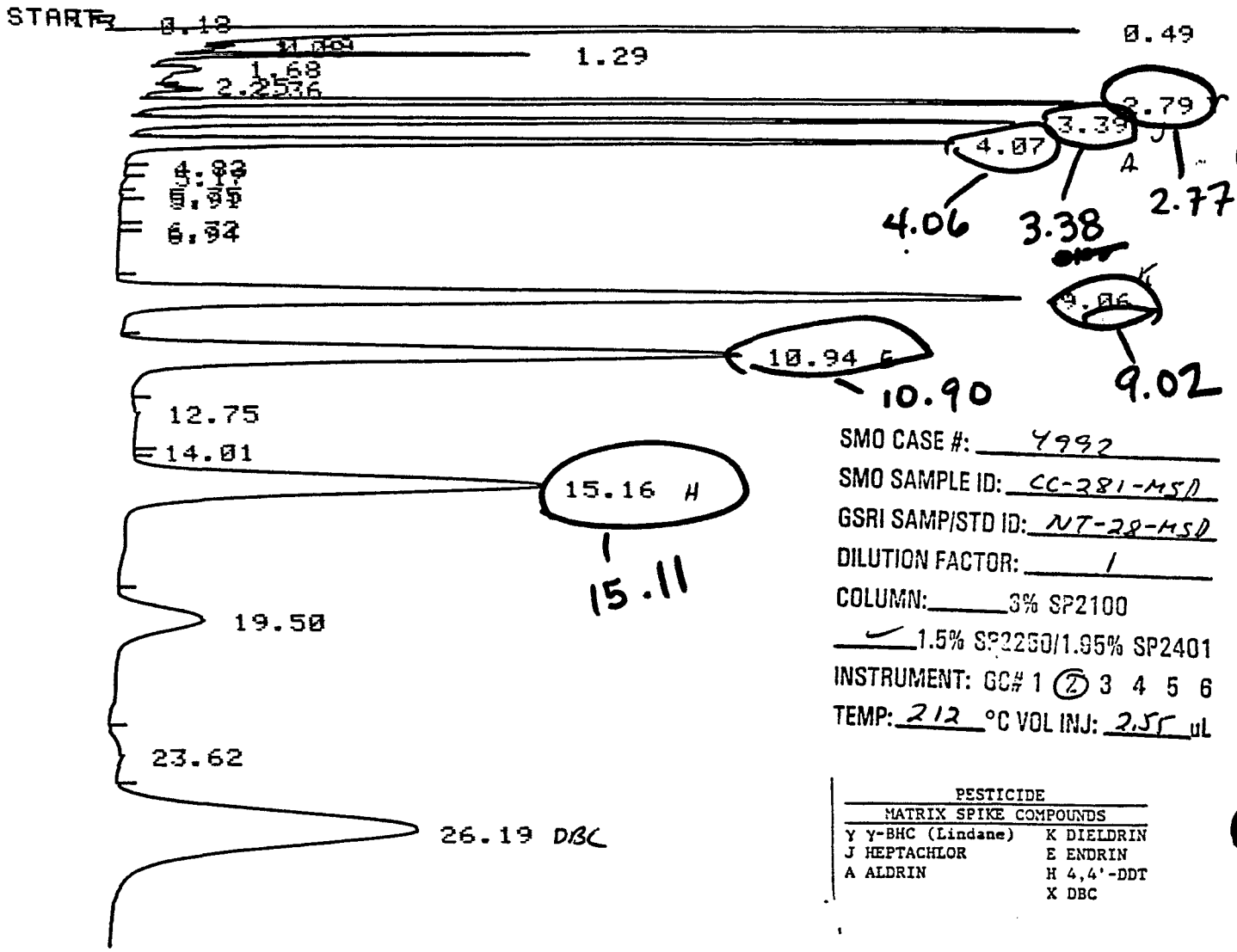
ALL TENTATIVE IDENTIFICATIONS OF CONFIDENT MATCHING QUALITY, WHICH AREN'T SUSPECTED ARTIFACTS/CONTAMINANTS, ARE LISTED BELOW:

SAMPLE #	FRACTION	SCAN #(S)	SPECTRUM MATCH INDICES TYPE	SCORE	TYPE	SCORE	ESTIMATED CONCENTRATION	COMPOUND NAME $-suchas	COMMENTS
CC270	VOA						N.D		
	BNA	1471	—				6.7 ug/L	Unknown.	
CC276	VOA						N.D		
↓	BNA	868	F.T	922	Pur	995	1100 ug/L	Hexahydro-2H-Azepin-2-one (Caprolactam)	
↓	↓	967					6.2 ug/L	Unknown contains oxygen	
↓	↓	1480					14 ug/L	Unknown contains oxygen & nitrogen.	
CC277	VOA						N.D.		
↓	BNA	853	F.T	995	Pur	923	120 ug/L	Caprolactam (see above)	
↓	↓	967					19 ug/L	Unknown contains oxygen.	
↓	↓	1330	F.T	989	Pur	971	1500 ug/L	Sulfur. (S8)	
↓	↓	1479					5.1 ug/L	Unknown	
↓	↓	1685					4.3 ug/L	Unknown.	
CC278	VOA						N.D		
↓	BNA	851	F.T	993	Pur	915	82 ug/L	Caprolactam	
↓	↓	1485					6.5 ug/L	Unknown.	
CC280	VOA						N.D		
↓	BNA	847	F.T	994	Pur	878	5.2 ug/L	Caprolactam	
↓	↓	1318	F.T	999	Pur	979	610 ug/L	Sulfur (S8)	
CC281	VOA	288	F.T	941	Pur	588	220 ug/Kg	hydrocarbon $ 2-methyl-1-pentene	
↓	↓	336	F.T	955	Pur	896	140 ug/Kg	2,3-dimethyl-butane.	
↓	BNA	1051	F.T	928	Pur	840	330,000 ug/Kg	Bis(2-methylpropyl)ester-2-butanoic acid.	
↓	↓	1258	F.T	994	Pur	858	270,000 ug/Kg	hydrocarbon $ 1-hexadecene.	
↓	↓	1366	F.T	996	Pur	843	130,000 ug/Kg	hydrocarbon $ cyclohexadecane	
↓	↓	1423	F.T	983	Pur	854	31,000 ug/Kg	Docosane.	
CC283	VOA						N.D.		
↓	BNA	438	F.T	995	Pur	782	53,000 ug/Kg	4-ethenyl-cyclohexene	
↓	↓	472						Ethylbenzene - VOA-PP!	
↓	↓	506						Styrene - VOA-PP.	
↓	↓	995	F.T	996	Pur	860	93,000 ug/Kg	1-decanol.	
↓	↓	1039	F.T	927	Pur	837	370,000 ug/Kg	Bis(2-methylpropyl)ester-2-butanoic acid	
↓	↓	1066	F.T	995	Pur	925	63,000 ug/Kg	Dibutylester 2-butenedioic acid	
↓	↓	1127	F.T	997	Pur	867	120,000 ug/Kg	hydrocarbon $ 1-tetradecanol.	
↓	↓	1247	F.T	994	Pur	854	1,000,000 ug/Kg	hydrocarbon $ 1-hexadecene.	
↓	↓	1287	F.T	988	Pur	761	47,000 ug/Kg	hexadecanoic acid.	
↓	↓	1356	F.T	995	Pur	851	1,500,000 ug/Kg	hydrocarbon $ cyclohexadecane	
↓	↓	1412	F.T	986	Pur	866	82,000 ug/Kg	hydrocarbon $ docosane.	
									AR100599
CC284	VOA	286					3300 ug/Kg	Unknown.	
↓	BNA	439	F.T	993	Pur	357	50,000 ug/Kg	4-ethenyl-cyclohexene.	
↓	↓	523	F.T	996	Pur	709	95,000 ug/Kg	2-butoxy-ethanol	
↓	↓	833	F.T	978	Pur	669	92,000 ug/Kg	2-phenoxy-1-propanol.	
↓	↓	959	F.T	928	Pur	888	140,000 ug/Kg	N,N-dipentyl-1-pentamine	
↓	↓	995	F.T	996	Pur	853	530,000 ug/Kg	1-docanol.	
↓	↓	1038	F.T	929	Pur	837	470,000 ug/Kg	dibutylester-2-butenedioic acid	AR100599

TENTATIVELY IDENTIFIED COMPOUND SAMPLE RESULTS

ALL TENTATIVE IDENTIFICATIONS OF CONFIDENT MATCHING QUALITY, WHICH AREN'T SUSPECTED ARTIFACTS/CONTAMINANTS, ARE LISTED BELOW:

SAMPLE #	FRACTION	SCAN #(S)	SPECTRUM MATCH INDICES				ESTIMATED CONCENTRATION	COMPOUND NAME	COMMENTS
			TYPE	SCORE	TYPE	SCORE			
CC284	BNA	1245	F.T	993	Pur	849	840,000 ug/kg	1-hexadecene	
(cont)	↓	1354	F.T	996	Pur	846	1,200,000 ug/kg	cyclohexadecane	
↓	↓	1411	F.T	983	Pur	715	150,000 ug/kg	2,3,7-trimethyl-decane.	
		1548					56,000 ug/kg	Unknown.	
		1739					50,000 ug/kg	Unknown	
↓	↓	1743					56,000 ug/kg	Unknown.	
CC294	VOA	288	F.T	951	Pur	778	220 ug/kg	2-methyl-1-pentene	
	↓	335	F.T	916	Pur	862	190 ug/kg	2,3-dimethyl-butane	
	BNA	257					TCE - found in VOA as PP.		
		1007	F.T	989	Pur	791	18,000 ug/kg	1-decene.	
		1051	F.T	968	Pur	840	270,000 ug/kg	Bis(2-methylisopropyl)-2-butendioic Acid	
		1061	F.T	933	Pur	873	29,000 ug/kg	Fatty acid & Decanoic Acid.	
		1139					17,000 ug/kg	Hydrocarbon & cyclododecane	
		1258	F.T	996	Pur	866	250,000 ug/kg	cyclohexadecane.	
		1366	F.T	995	Pur	841	120,000 ug/kg	1-hexadecene.	
↓	↓	1424	F.T	973	Pur	849	26,000 ug/kg	docosane	



SMO CASE #: 4992

SMO SAMPLE ID: CC-281-MSD

GSRI SAMP/STD ID: NT-28-MSD

DILUTION FACTOR: 1

COLUMN: 3% SP2100

✓ 1.5% SP2250/1.95% SP2401

INSTRUMENT: GC# 1 (2) 3 4 5 6

TEMP: 212 °C VOL INJ: 2.5 uL

PESTICIDE MATRIX SPIKE COMPOUNDS	
Y γ-BHC (Lindane)	K DIELDRIN
J HEPTACHLOR	E ENDRIN
A ALDRIN	H 4,4'-DDT
	X DBC

HP RUN # 28 OCT/07/85 TIME 23:39:20
ID:---2--- BOTTLE 28
AREA %

RT	AREA	AREA %
0.49	949000	10.725
1.29	96120	1.086
1.68	35310	0.399
2.36	10190	0.115
2.79	643800	7.276
3.39	580400	6.560
4.07	644800	7.287
9.06	1529000	17.280
10.94	1228000	13.879
12.75	13090	0.148
15.16	1110000	12.545
19.50	354000	4.001
23.62	37460	0.423
26.19	1617000	18.275

DIL FACTOR: 1.0000 E+ 0

all 6 outside RT window

① No mention of this anywhere

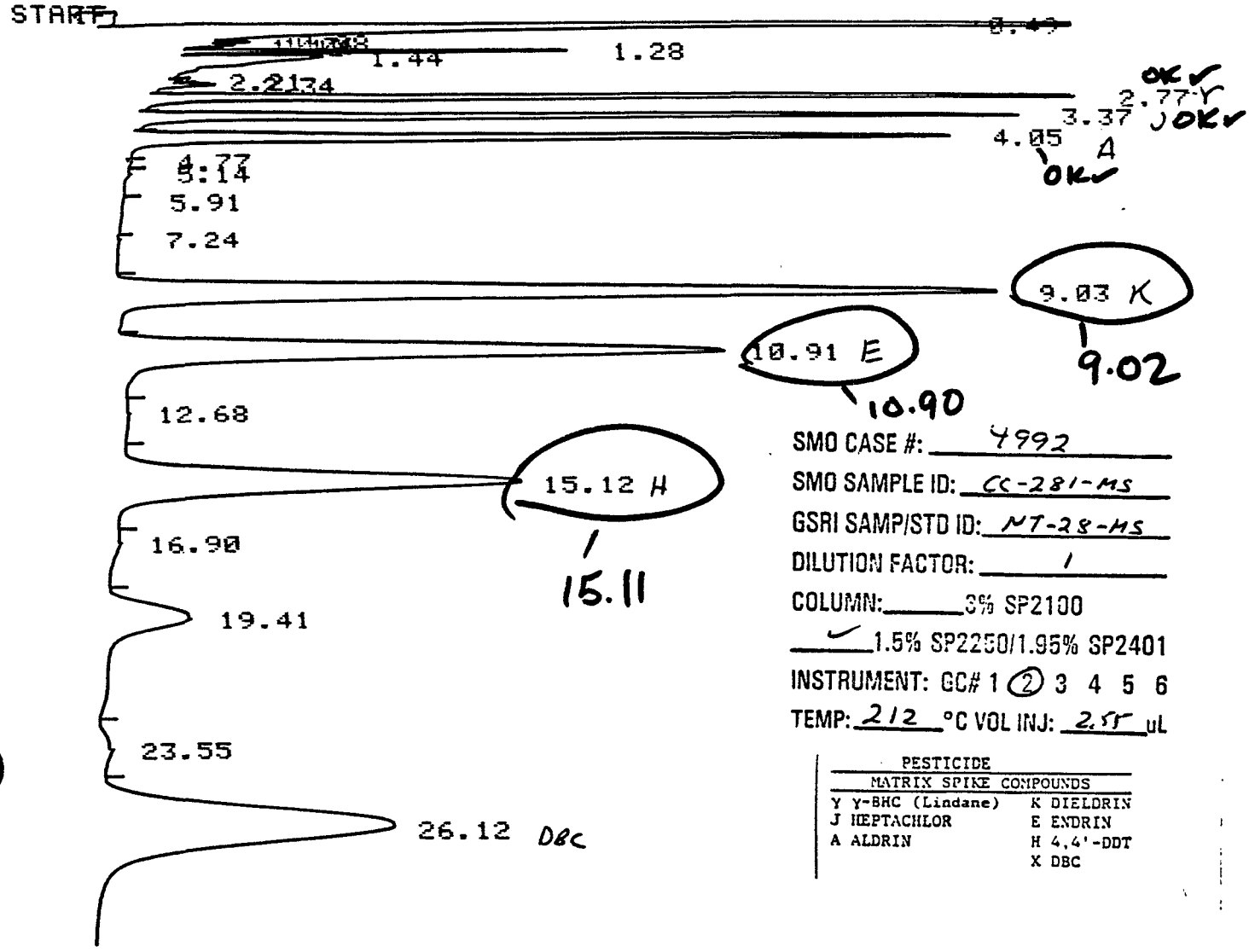
② Reviewer has examined all chromatograms with widen RT windows - no positives

③ Clearly demonstrates a method problem

see PAGE 3 for lab's RT windows

PAGE ①

AR100601



SMO CASE #: 4992

SMO SAMPLE ID: CC-281-MS

GSRI SAMP/STD ID: MT-28-MS

DILUTION FACTOR: 1

COLUMN: 3% SP2100

✓ 1.5% SP2250/1.95% SP2401

INSTRUMENT: GC# 1 (2) 3 4 5 6

TEMP: 212 °C VOL INJ: 2.5 uL

PESTICIDE MATRIX SPIKE COMPOUNDS	
Y Y-BHC (Lindane)	K DIELDRIN
J HEPTACHLOR	E ENDRIN
A ALDRIN	H 4,4'-DDT
	X DBC

HP RUN # 27 OCT/07/85 TIME 23:06:32
ID:---2--- BOTTLE 27
AREA %

RT	AREA	AREA %
0.49	1259000	14.032
1.28	96140	1.072
1.44	58400	0.651
2.34	12200	0.136
2.77	634800	7.075
3.37	566900	6.318
4.05	627000	6.988
9.03	1482000	16.517
10.91	1199000	13.363
15.12	1091000	12.159
19.41	337800	3.765
23.55	36220	0.404
26.12	1572000	17.520

DIL FACTOR: 1.0000 E+ 0

3 out the 6 out of RT window

PAGE (2)

ROLS CORPORATION BUFFALO, NEW YORK PART NO. HP-5080-8735 PRINTED IN U.S.A.

PESTICIDE/PCB STANDARDS SUMMARY

Case Number: 4992
Contract Number: 68-01-6959

Laboratory: Gulf South Research Institute
GC Column: 1.5% SP-2250/1.95%
GC Instrument ID: 2

2401

Analysis: (Quant.) Conf. (Circle One)

	Date of Analysis: OCT 7 85 Time of Analysis: PEST MIX A: 1014 PEST MIX B: 1047			Date of Analysis: OCT 7 85 Time of Analysis: PEST MIX A: 2201 PEST MIX B: 2234			Date of Analysis: OCT 8 85 Time of Analysis: PEST MIX A: 0430 PEST MIX B: 0503		
Compound	RT	RT Window	Calib Factor	RT	Calib Factor	% Diff.	RT	Calib Factor	% Diff.
Alpha-BHC	2.20	2.18 - 2.22	20967	2.20	20983	0.1	2.20	19357	-7.7
Beta-BHC	3.08	3.05 - 3.11	8980	3.08	9443	5.2	3.07	8149	-13.7
Delta-BHC	3.58	3.54 - 3.61	30463	3.58	30980	1.7	3.57	30008	-3.1
Gamma-BHC	2.75	2.72 - 2.77	48902	2.75	50451	3.2	2.74	43412	-14.0
Heptachlor	3.35	3.31 - 3.38	41268	3.35	42850	3.8	3.33	36601	-14.6
Aldrin	4.04	3.98 - 4.06	41020	4.02	44616	8.8	4.00	40846	-8.4
Heptachlor Epoxide	5.90	5.84 - 5.96	40463	5.91	43467	7.4	5.88	38926	-10.4
Endosulfan I	7.38	7.30 - 7.45	30695	7.39	32020	4.3	7.36	28259	-11.7
Dieldrin	8.94	8.84 - 9.02	48471	8.95	50779	4.8	8.90	45910	-9.6
4,4'-DDE	8.29	8.20 - 8.37	35989	8.31	38801	7.8	8.25	35722	-7.9
Endrin	10.81	10.68 - 10.90	29020	10.81	30795	6.1	10.75	27759	-9.9
Endosulfan II	12.95	12.80 - 13.06	49412	12.96	49559	0.3	12.88	48069	-3.0
4,4'-DDD	12.50	12.36 - 12.61	30165	12.51	31992	6.1	12.44	28149	-12.0
Endrin Aldehyde	16.81	16.61 - 16.94	28451	16.81	29449	3.5	16.70	25057	-14.9
Endosulfan Sulfate	20.29	20.07 - 20.47	16318	20.33	17351	6.3	20.19	14783	-14.8
4,4'-DDT	14.98	14.81 - 15.11	25661	14.99	27387	6.7	14.90	23137	-15.5
Methoxychlor	27.78	27.44 - 28.00	13137	27.78	13455	2.4	27.60	11893	-11.6
Endrin Ketone	27.32	27.00 - 27.55	3902	27.30	3760	-3.6	27.21	3309	-12.0
Chlordane	6.52	6.45 - 6.59							
Toxaphene	15.79	15.63 - 15.95							
Aroclor-1016	3.28	3.25 - 3.31							
Aroclor-1221	2.04	2.02 - 2.06							
Aroclor-1232	3.27	3.24 - 3.30							
Aroclor-1242	3.25	3.22 - 3.28							
Aroclor-1248	3.27	3.24 - 3.30							
Aroclor-1254	9.06	8.97 - 9.15							
Aroclor-1260	11.52	11.40 - 11.64							

Reviewed: RM
Date: 10-09-1985

INITIAL CALIBRATION DATA - ~~SEMI~~VOLATILE HSL COMPOUNDS

CASE NO. 4992 CONTRACT LAB: GSRI
CONTRACT NO. 68-01-6959 INSTRUMENT IDENTIFIER: FINN-01
CALIBRATION DATE: 09/30/85
MINIMUM MEAN RF FOR SPCC IS 0.05
MAXIMUM %RSD FOR CCC IS 30%

	COMPOUND	vs0930SE RF 20NG	vs0930SF RF 50NG	vs0930SD RF ~~80~~NG 100 cm	vs0930SC RF ~~120~~NG 150 cm	vs0930SB RF ~~160~~NG 200 cm	MEAN RF	%RSD
C010	CHLOROMETHANE**	0.459	0.442	0.404	0.502	0.494	0.460 ✓	7.7
C015	BROMOMETHANE	0.239	0.208	0.194	0.190	0.188	0.204 ✓	9.3
C020	VINYL CHLORIDE*	0.365	0.297	0.282	0.303	0.305	0.311 ✓	9.1
C025	CHLOROETHANE	0.169	0.129	0.147	0.155	0.175	0.155 ✓	10.6
C030	METHYLENE CHLORIDE	0.487	0.244	0.242	0.255	0.218	0.289 ✓	34.3 - all qualifiers
C035	ACETONE	1.172	0.739	0.642	0.745	0.659	0.792	24.6 ✓
C040	CARBON DISULFIDE	4.789	3.925	4.451	4.956	4.782	4.581 ✓	7.9
C045	1,1-DICHLOROETHENE*	1.412	1.237	1.324	1.460	1.423	1.371 ✓	5.8
C050	1,1-DICHLOROETHANE**	3.880	3.280	3.752	3.811	3.808	3.706 ✓	5.8
C055	TRANS-1,2-DICHLOROETHE	1.910	1.634	1.849	1.895	1.892	1.836 ✓	5.6
C060	CHLOROFORM*	3.143	2.621	2.985	3.012	3.020	2.956 ✓	5.9
C065	1,2-DICHLOROETHANE	0.271	0.210	0.255	0.248	0.246	0.246 ✓	8.0
C110	2-BUTANONE	0.042	0.034	0.032	0.035	0.036	0.036 [J]	9.4
C115	1,1,1-TRICHLOROETHANE	0.375	0.327	0.363	0.395	0.391	0.370 ✓	6.6
C120	CARBON TETRACHLORIDE	0.267	0.239	0.260	0.285	0.278	0.266 ✓	5.9
C125	VINYL ACETATE	0.349	0.253	0.757	1.172	1.367	0.780	56.2 - LOQ
C130	BROMODICHLOROMETHANE	0.032	0.030	0.037	0.039	0.037	0.035 [J]	9.6
C140	1,2-DICHLOROPROPANE*	0.589	0.482	0.547	0.567	0.559	0.549 ✓	6.5
C145	TRANS-1,3-DICHLOROPROP	0.597	0.483	0.569	0.615	0.623	0.577 ✓	8.7
C150	TRICHLOROETHENE	0.364	0.322	0.316	0.333	0.331	0.333 ✓	4.9
C155	DIBROMOCHLOROMETHANE	0.317	0.260	0.299	0.316	0.316	0.302 ✓	7.1
C160	1,1,2-TRICHLOROETHANE	0.337	0.276	0.297	0.302	0.297	0.302 ✓	6.5
C165	BENZENE	1.184	0.959	1.070	1.083	1.060	1.071	6.6
C170	CIS-1,3-DICHLOROPROPENE	0.461	0.405	0.455	0.501	0.498	0.464 ✓	7.5
C175	2-CHLOROETHYLVINYL ETH	1.124	1.108	0.087	1.273	1.323	0.983 ✓	46.3 - LOQ
C180	BROMOFORM**	0.204	0.168	0.194	0.212	0.202	0.196 [2]	7.6
C210	2-HEXANONE	0.830	0.809	0.731	0.991	0.950	0.862 ✓	11.0
C215	4-METHYL-2-PENTANONE	0.092	0.079	0.085	0.100	0.094	0.090 ✓	7.9
C220	TETRACHLOROETHENE	0.347	0.287	0.314	0.335	0.331	0.323 ✓	6.4
C135	1,1,2,2-TETRACHLOROETH	0.596	0.456	0.577	0.633	0.638	0.580 ✓	11.3
C230	TOLUENE*	0.856	0.671	0.718	0.742	0.731	0.743 ✓	8.2
C235	CHLOROBENZENE**	1.017	0.809	0.860	0.900	0.855	0.888 ✓	7.9
C240	ETHYLBENZENE*	0.439	0.365	0.385	0.407	0.387	0.397 ✓	6.2
C245	STYRENE	0.904	0.714	0.771	0.822	0.825	0.807 ✓	7.8
C250	O & P XYLENE (MIXED)	0.511	0.400	0.434	0.453	0.449	0.449 ✓	8.0
C250	M-XYLENE	0.553	0.434	0.480	0.460	0.479	0.481 ✓	8.1

LOQ - Effective limit of quantitation not necessarily detection limits
[J] D.L 2-butanone & bromodichloromethane unreliable - No spls associated
[2] Contract violation RF should be >0.250

Form VI

CALIBRATION CHECK - ~~SEMI~~VOLATILE HSL COMPOUNDS
am
CASE NO. 4992 CONTRACT LAB: GSRI
CONTRACT NO. 68-01-6959 INSTRUMENT IDENTIFIER: FINN-01
CALIBRATION DATE: 09/30/85
STANDARD FILE: VS100185A
DATE: 10/01/85 TIME: 13:36
MAXIMUM % D FOR CCC IS 20 — should be 25%

25% for comment (aside from contractual requirements)

	COMPOUND	MEAN RF(I)	RF(O)	% D	
C010	CHLOROMETHANE**	0.460	0.492	6.890	
C015	BROMOMETHANE	0.204	0.271	33.152	LOQ
C020	VINYL CHLORIDE*	0.311	0.373	20.235	
C025	CHLOROETHANE	0.155	0.186	20.172	
C030	METHYLENE CHLORIDE	0.289	0.335	15.930	
C035	ACETONE	0.792	1.029	29.936	All positives questioned
C040	CARBON DISULFIDE	4.581	5.289	15.447	
C045	1,1-DICHLOROETHENE*	1.371	1.566	14.232	
C050	1,1-DICHLOROETHANE**	3.706	4.303	16.100	
C055	TRANS-1,2-DICHLOROETHE	1.836	2.062	12.281	
C060	CHLOROFORM*	2.956	3.453	16.811	
C065	1,2-DICHLOROETHANE	0.246	0.289	17.584	
C110	2-BUTANONE	0.036	0.045	23.719	DIL
C115	1,1,1-TRICHLOROETHANE	0.370	0.430	16.231	
C120	CARBON TETRACHLORIDE	0.266	0.316	18.935	
C125	VINYL ACETATE	0.780	1.299	66.496	LOQ
C130	BROMODICHLOROMETHANE	0.035	0.041	15.806	DIL
C140	1,2-DICHLOROPROPANE*	0.549	0.622	13.413	
C145	TRANS-1,3-DICHLOROPROP	0.577	0.635	10.002	
C150	TRICHLOROETHENE	0.333	0.361	8.381	
C155	DIBROMOCHLOROMETHANE	0.302	0.362	19.874	
C160	1,1,2-TRICHLOROETHANE	0.302	0.353	17.051	
C165	BENZENE	1.071	1.234	15.184	
C170	CIS-1,3-DICHLOROPROPEN	0.464	0.555	19.513	
C175	2-CHLOROETHYLVINYL ETH	0.983	1.204	22.484	
C180	BROMOFORM**	0.196	0.233	18.544	SPCC violation
C210	2-HEXANONE	0.862	1.026	18.990	
C215	4-METHYL-2-PENTANONE	0.090	0.114	26.698	LOQ
C220	TETRACHLOROETHENE	0.323	0.356	10.421	
C135	1,1,2,2-TETRACHLOROETH	0.580	0.718	23.831	
C230	TOLUENE*	0.743	0.823	10.712	
C235	CHLOROBENZENE**	0.888	1.004	13.049	
C240	ETHYLBENZENE*	0.397	0.447	12.739	
C245	STYRENE	0.807	0.940	16.410	
C250	O & P XYLENE (MIXED)	0.449	0.481	7.100	
C250	M-XYLENE	0.481	0.545	13.288	

(1) CC291, a CC277 (field blk) — DIL unreliable for 2-butanone & bromodichloromethane

(2) — 1 SPCC violation

Team VII

CALIBRATION CHECK - ~~SEMI~~VOLATILE HSL COMPOUNDS
am

CASE NO. 4992 CONTRACT LAB: GSRI
CONTRACT NO. 68-01-6959 INSTRUMENT IDENTIFIER: FINN-01
CALIBRATION DATE: 09/30/85
STANDARD FILE: VS100285A
DATE: 10/02/85 TIME: 8:39
MAXIMUM % D FOR CCC IS 20

	COMPOUND	MEAN RF(I)	RF(C)	% D
C010	CHLOROMETHANE** ✓	0.460	0.509 ✓	10.564 ✓
C015	BROMOMETHANE	0.204	0.236	15.694 ✓
C020	VINYL CHLORIDE* ✓	0.311	0.370	19.103 ✓
C025	CHLOROETHANE	0.155	0.164	5.943 ✓
C030	METHYLENE CHLORIDE	0.289	0.213	-26.244 - LOQ - all questioned
C035	ACETONE	0.792	0.808	2.120 ✓
C040	CARBON DISULFIDE	4.581	4.916	7.307 ✓
C045	1,1-DICHLOROETHENE*	1.371	1.409	2.773 ✓
C050	1,1-DICHLOROETHANE**	3.706	3.748	1.127 ✓
C055	TRANS-1,2-DICHLOROETHE	1.836	1.872	1.965 ✓
C060	CHLOROFORM*	2.956	3.118	5.470 ✓
C065	1,2-DICHLOROETHANE	0.246	0.265	7.504 ✓
C110	2-BUTANONE	0.036	0.034	-5.740 - D.L
C115	1,1,1-TRICHLOROETHANE	0.370	0.396	7.022 ✓
C120	CARBON TETRACHLORIDE	0.266	0.292	9.660 ✓
C125	VINYL ACETATE	0.780	1.172	50.265 - LOQ
C130	BROMODICHLOROMETHANE	0.035	0.037	6.607 - D.L
C140	1,2-DICHLOROPROPANE*	0.549	0.552	0.502 ✓
C145	TRANS-1,3-DICHLOROPROP	0.577	0.583	1.005 ✓
C150	TRICHLOROETHENE	0.333	0.324	-2.799 ✓
C155	DIBROMOCHLOROMETHANE	0.302	0.315	4.458 ✓
C160	1,1,2-TRICHLOROETHANE	0.302	0.304	0.575 ✓
C165	BENZENE	1.071	1.090	1.740 ✓
C170	CIS-1,3-DICHLOROPROPEN	0.464	0.475	2.446 ✓
C175	2-CHLOROETHYLVINYL ETH	0.983	1.162	18.156 ✓
C180	BROMOFORM**	0.196	0.200	2.232 - SPCC violation.
C210	2-HEXANONE	0.862	0.916	6.235 ✓
C215	4-METHYL-2-PENTANONE	0.090	0.080	-10.693 ✓
C220	TETRACHLOROETHENE	0.323	0.330	2.330 ✓
C135	1,1,2,2-TETRACHLOROETH	0.580	0.577	-0.393 ✓
C230	TOLUENE*	0.743	0.742	-0.187 ✓
C235	CHLOROBENZENE**	0.888	0.903	1.588 ✓
C240	ETHYLBENZENE*	0.397	0.397	-0.008 ✓
C245	STYRENE	0.807	0.767	-4.979 ✓
C250	O & P XYLENE (MIXED)	0.449	0.423	-5.775 ✓
C250	M-XYLENE	0.481	0.474	-1.552 ✓

① D.L unreliable for 2-butanone & bromodichloromethane in CC270, 276, 278 & 280

② Bromoform SPCC violation < 0.250

Form VII

CALIBRATION CHECK - ~~SEMI~~VOLATILE HSL COMPOUNDS

CASE NO. 4992 — CONTRACT LAB: GSRI

CONTRACT NO. 68-01-6959 — INSTRUMENT IDENTIFIER: FINN-01

CALIBRATION DATE: 09/30/85

STANDARD FILE: VS100285B

DATE: 10/02/85 TIME: 15:02

MAXIMUM % D FOR CCC IS 20

	COMPOUND	MEAN RF(I)	RF(O)	% D	
C010	CHLOROMETHANE**	0.460	0.605	31.505	-LOQ
C015	BROMOMETHANE	0.204	0.259	27.127	-LOQ
C020	VINYL CHLORIDE*	0.311	0.399	28.549	-CCC violation also CC283 & CC284 estimated.
C025	CHLOROETHANE	0.155	0.159	2.759	
C030	METHYLENE CHLORIDE	0.289	0.236	-18.196	
C035	ACETONE	0.792	0.707	-10.731	
C040	CARBON DISULFIDE	4.581	4.583	0.053	
C045	1,1-DICHLOROETHENE*	1.371	1.365	-0.460	
C050	1,1-DICHLOROETHANE**	3.706	3.745	1.040	
C055	TRANS-1,2-DICHLOROETHE	1.836	1.825	-0.606	
C060	CHLOROFORM*	2.956	3.091	4.560	
C065	1,2-DICHLOROETHANE	0.246	0.251	1.878	
C110	2-BUTANONE	0.036	0.030	-16.729	-D.L 2butanone
C115	1,1,1-TRICHLOROETHANE	0.370	0.390	5.250	
C120	CARBON TETRACHLORIDE	0.266	0.291	9.553	
C125	VINYL ACETATE	0.780	1.073	37.548	-LOQ
C130	BROMODICHLOROMETHANE	0.035	0.037	6.719	-D.L
C140	1,2-DICHLOROPROPANE*	0.549	0.535	-2.518	
C145	TRANS-1,3-DICHLOROPROP	0.577	0.581	0.600	
C150	TRICHLOROETHENE	0.333	0.324	-2.880	
C155	DIBROMOCHLOROMETHANE	0.302	0.312	3.467	
C160	1,1,2-TRICHLOROETHANE	0.302	0.299	-0.990	
C165	BENZENE	1.071	1.080	0.794	
C170	CIS-1,3-DICHLOROPROPEN	0.464	0.472	1.809	
C175	2-CHLOROETHYLVINYL ETH	0.983	1.190	21.014	
C180	BROMOFORM**	0.196	0.201	2.358	-SPCC violation
C210	2-HEXANONE	0.862	1.214	40.810	-LOQ
C215	4-METHYL-2-PENTANONE	0.090	0.079	-11.659	
C220	TETRACHLOROETHENE	0.323	0.337	4.553	
C135	1,1,2,2-TETRACHLOROETH	0.580	0.592	2.064	
C230	TOLUENE*	0.743	0.744	0.051	
C235	CHLOROBENZENE**	0.888	0.911	2.582	
C240	ETHYLBENZENE*	0.397	0.400	0.772	
C245	STYRENE	0.807	0.784	-2.846	
C250	O & P XYLENE (MIXED)	0.449	0.440	-2.023	
C250	M-XYLENE	0.481	0.463	-3.674	

(1) D.L 2-butanone & bromodichloromethane unreliable in CC281, CC294, CC284, & CC283

(2) Vinyl chloride in CC283 & CC284 ~~estimated~~ ok - NO rerun next day with acceptable %D (not commented on.)

(3) 1 SPCC violation, 1 CCC violation

Form VII

CALIBRATION CHECK - ~~SEMI~~VOLATILE HSL COMPOUNDS
am

CASE NO. 4992 CONTRACT LAB: GSRI
CONTRACT NO. 68-01-6959 INSTRUMENT IDENTIFIER: FINN-01
CALIBRATION DATE: 09/30/85
STANDARD FILE: VS100385A
DATE: 10/03/85 TIME: 9:30
MAXIMUM % D FOR CCC IS 20

	COMPOUND	MEAN RF(I)	RF(O)	% D	
C010	CHLOROMETHANE**	0.460	0.350	-23.816	✓
C015	BROMOMETHANE	0.204	0.174	-14.420	✓
C020	VINYL CHLORIDE*	0.311	0.336	8.149	OK
C025	CHLOROETHANE	0.155	0.112	-27.355	LOQ
C030	METHYLENE CHLORIDE	0.289	0.165	-42.684	LOQ - All positives questional
C035	ACETONE	0.792	0.587	-25.876	LOQ All positives questional
C040	CARBON DISULFIDE	4.581	4.888	6.713	✓
C045	1,1-DICHLOROETHENE*	1.371	1.354	-1.221	✓
C050	1,1-DICHLOROETHANE**	3.706	3.699	-0.180	✓
C055	TRANS-1,2-DICHLOROETHE	1.836	2.031	10.630	✓
C060	CHLOROFORM*	2.956	3.032	2.558	✓
C065	1,2-DICHLOROETHANE	0.246	0.250	1.477	✓
C110	2-BUTANONE	0.036	0.028	-21.241	DL
C115	1,1,1-TRICHLOROETHANE	0.370	0.376	1.454	✓
C120	CARBON TETRACHLORIDE	0.266	0.282	6.076	✓
C125	VINYL ACETATE	0.780	1.228	57.471	LOQ
C130	BROMODICHLOROMETHANE	0.035	0.038	8.414	DL
C140	1,2-DICHLOROPROPANE*	0.549	0.524	-4.435	✓
C145	TRANS-1,3-DICHLOROPROP	0.577	0.553	-4.189	✓
C150	TRICHLOROETHENE	0.333	0.311	-6.735	✓
C155	DIBROMOCHLOROMETHANE	0.302	0.290	-3.774	✓
C160	1,1,2-TRICHLOROETHANE	0.302	0.281	-6.903	✓
C165	BENZENE	1.071	1.015	-5.268	✓
C170	CIS-1,3-DICHLOROPROPEN	0.464	0.450	-2.952	✓
C175	2-CHLOROETHYLVINYL ETH	0.983	1.332	35.523	LOQ
C180	BROMOFORM**	0.196	0.196	0.046	SPCC Violation
C210	2-HEXANONE	0.862	1.152	33.579	LOQ
C215	4-METHYL-2-PENTANONE	0.090	0.078	-12.962	✓
C220	TETRACHLOROETHENE	0.323	0.312	-3.169	✓
C135	1,1,2,2-TETRACHLOROETH	0.580	0.545	-5.992	✓
C230	TOLUENE*	0.743	0.690	-7.188	✓
C235	CHLOROBENZENE**	0.888	0.908	2.231	✓
C240	ETHYLBENZENE*	0.397	0.387	-2.542	✓
C245	STYRENE	0.807	0.781	-3.241	✓
C250	O & P XYLENE (MIXED)	0.449	0.436	-3.043	✓
C250	M-XYLENE	0.481	0.455	-5.331	✓

① D.L 2-butanone & bromodichloromethane CC281, CC294, CC284, 283 unreliable as may be substantially higher than reported

Item VII

CALIBRATION CHECK - ~~SEMI~~VOLATILE HSL COMPOUNDS
CASE NO. 4992 am CONTRACT LAB: GSRI
CONTRACT NO. 68-01-6959 INSTRUMENT IDENTIFIER: FINN-01
CALIBRATION DATE: 09/30/85
STANDARD FILE: VS100485A
DATE: 10/04/85 TIME: 8:44
MAXIMUM % D FOR CCC IS 20

	COMPOUND	MEAN RF(I)	RF(O)	% D
C010	CHLOROMETHANE**	0.460	0.394	-14.267
C015	BROMOMETHANE	0.204	0.164	-19.274
C020	VINYL CHLORIDE*	0.311	0.287	-7.486
C025	CHLOROETHANE	0.155	0.111	-28.221 — LOQ
C030	METHYLENE CHLORIDE	0.289	0.214	-26.081 - LOQ
C035	ACETONE	0.792	0.683	-13.700
C040	CARBON DISULFIDE	4.581	4.657	1.653
C045	1,1-DICHLOROETHENE*	1.371	1.398	1.938
C050	1,1-DICHLOROETHANE**	3.706	3.757	1.381
C055	TRANS-1,2-DICHLOROETHE	1.836	1.936	5.436
C060	CHLOROFORM*	2.956	3.178	7.496
C065	1,2-DICHLOROETHANE	0.246	0.258	4.960
C110	2-BUTANONE	0.036	0.033	-9.061 — DL.
C115	1,1,1-TRICHLOROETHANE	0.370	0.408	10.265
C120	CARBON TETRACHLORIDE	0.266	0.289	8.577
C125	VINYL ACETATE	0.780	1.170	49.967 — LOQ
C130	BROMODICHLOROMETHANE	0.035	0.038	7.896 — DL
C140	1,2-DICHLOROPROPANE*	0.549	0.532	-3.039
C145	TRANS-1,3-DICHLOROPROP	0.577	0.567	-1.699
C150	TRICHLOROETHENE	0.333	0.322	-3.238
C155	DIBROMOCHLOROMETHANE	0.302	0.323	6.979
C160	1,1,2-TRICHLOROETHANE	0.302	0.312	3.369
C165	BENZENE	1.071	1.098	2.539
C170	CIS-1,3-DICHLOROPROPEN	0.464	0.499	7.623
C175	2-CHLOROETHYLVINYL ETH	0.983	1.408	43.263 — LOQ
C180	BROMOFORM**	0.196	0.205	4.398 — SPCC
C210	2-HEXANONE	0.862	1.375	59.416 — LOQ
C215	4-METHYL-2-PENTANONE	0.090	0.088	-1.462
C220	TETRACHLOROETHENE	0.323	0.342	6.115
C135	1,1,2,2-TETRACHLOROETH	0.580	0.626	7.950
C230	TOLUENE*	0.743	0.764	2.765
C235	CHLOROBENZENE**	0.888	0.931	4.830
C240	ETHYLBENZENE*	0.397	0.408	2.881
C245	STYRENE	0.807	0.793	-1.713
C250	O & P XYLENE (MIXED)	0.449	0.437	-2.860
C250	M-XYLENE	0.481	0.459	-4.673

No actual spls run this day (just MS+MSD)

SPCC Violation

Form VII

CALIBRATION CHECK - SEMIVOLATILE HSL COMPOUNDS

CASE NO. 4992 CONTRACT LAB: GSRI

CONTRACT NO. 68-01-6959 INSTRUMENT IDENTIFIER: FINN-02

CALIBRATION DATE: 10/03/85

STANDARD FILE: SS100485A

DATE: 10/04/85 TIME: 15:27

MAXIMUM % D FOR CCC IS 20

	COMPOUND	MEAN RF(I)	RF(O)	% D	
C310	N-NITROSODIMETHYLAMINE	0.676	0.697	3.010	
C315	PHENOL	1.570	1.507	-4.043	
C320	ANILINE	1.318	0.195	-85.172	-LOQ
C325	BIS(2 CHLOROETHYL)ETHE	1.307	1.381	5.657	
C330	2-CHLOROPHENOL	1.273	1.309	2.826	
C335	1,3-DICHLOROBENZENE	1.442	1.498	3.896	
C340	1,4-DICHLOROBENZENE*	1.531	1.583	3.419	
C345	BENZYL ALCOHOL	0.839	0.751	-10.392	
C350	1,2-DICHLOROBENZENE	1.426	1.465	2.762	
C355	2-METHYLPHENOL	1.215	1.162	-4.348	
C360	BIS(2-CHLOROISOPROPYL)	1.501	1.577	5.059	
C365	4-METHYLPHENOL	1.371	~~1.336~~ 0.949	~~-2.529~~ 55.31	-LOQ
C370	N-NITROSO-DI-N-PROPYLA	0.238	0.229	-3.939	
C375	HEXACHLOROETHANE	0.549	0.566	2.992	
C410	NITROBENZENE	0.307	0.337	9.631	
C415	ISOPHORONE	0.599	0.622	3.860	
C420	2-NITROPHENOL*	0.228	0.220	-3.619	
C425	2,4-DIMETHYLPHENOL	0.296	0.298	0.667	
C430	BENZOIC ACID	0.205	0.226	10.272	
C435	BIS(2-CHLOROETHOXY)MET	0.408	0.438	7.368	
C440	2,4-DICHLOROPHENOL*	0.292	0.301	3.223	
C445	1,2,4-TRICHLOROBENZENE	0.308	0.326	5.927	
C450	NAPHTHALENE	0.923	0.987	6.852	
C455	4-CHLOROANILINE	0.212	0.040	-80.942	-LOQ-DL
C460	HEXACHLOROBUTADIENE*	0.138	0.160	15.684	
C465	4-CHLORO-3-METHYLPHENO	0.270	0.269	-0.281	
C470	2-METHYLNAPHTHALENE	0.564	0.567	0.635	
C510	HEXACHLOROCYCLOPENTADI	0.283	0.315	11.035	
C515	2,4,6-TRICHLOROPHENOL*	0.401	0.423	5.404	
C520	2,4,5-TRICHLOROPHENOL	0.347	0.390	12.305	
C525	2-CHLORONAPHTHALENE	1.161	1.198	3.199	
C530	2-NITROANILINE	0.427	0.354	-16.924	
C535	DIMETHYL PHTHALATE	1.264	1.314	3.927	
C540	ACENAPHTHYLENE	1.721	1.509	-12.305	
C545	3-NITROANILINE	0.158	0.105	-33.518	-LOQ
C550	ACENAPTHENE*	1.128	1.172	3.916	
C555	2,4-DINITROPHENOL	0.189	0.212	12.183	
C560	4-NITROPHENOL**	0.089	0.102	13.611	
C565	DIBENZOFURAN	1.589	1.710	7.634	

D.L 4-chloroaniline unreliable in CC278, ~~CC291~~ 6, CC280
CC294, CC281

FORM VII

CALIBRATION CHECK - SEMIVOLATILE HSL COMPOUNDS

CASE NO. 4992 CONTRACT LAB: GSRI

CONTRACT NO. 68-01-6959 INSTRUMENT IDENTIFIER: FINN-02

CALIBRATION DATE: 10/03/85

STANDARD FILE: SS100485A

DATE: 10/04/85 TIME: 15:27

MAXIMUM % D FOR CCC IS 20

	COMPOUND	MEAN RF(I)	RF(O)	% D
C570	2,4-DINITROTOLUENE	0.410	0.411	0.369
C575	2,6-DINITROTOLUENE	0.338	0.337	-0.078
C580	DIETHYL PHTHALATE	1.209	1.278	5.651
C585	4-CHLOROPHENYL PHENYL	0.595	0.643	8.020
C590	FLUORENE	1.331	1.457	9.458
C595	4-NITROANILINE	0.197	0.141	-27.997 LOQ
C610	4,6-DINITRO-2-METHYLPH	0.126	0.139	9.797
C615	N-NITROSODIPHENYLAMINE	0.410	0.237	-42.140 LOQ CCC Violation
C625	4-BROMOPHENYL PHENYL E	0.194	0.210	8.210
C630	HEXACHLOROBENZENE	0.232	0.275	18.152
C635	PENTACHLOROPHENOL*	0.136	0.165	20.951
C640	PHENANTHRENE	1.007	1.024	1.649
C645	ANTHRACENE	0.897	0.905	0.944
C650	DI-N-BUTYL PHTHALATE	1.110	1.126	1.415
C655	FLUORANTHENE*	0.928	1.009	8.672
C710	BENZIDINE	0.066	0.034	-48.956 still SPCC?
C715	PYRENE	1.608	1.355	-15.683
C720	BUTYL BENZYL PHTHALATE	0.782	0.663	-15.234
C725	3,3'-DICHLOROBENZIDINE	0.308	0.309	0.129
C730	BENZO(A)ANTHRACENE	1.223	1.189	-2.787
C735	BIS(2-ETHYLHEXYL)PHTHA	1.083	0.939	-13.293
C740	CHRYSENE	1.135	1.092	-3.834
C760	DI-N-OCTYL PHTHALATE*	3.182	2.646	-16.843
C765	BENZO(B)FLUORANTHENE	1.994	1.834	-8.004
C770	BENZO(K)FLUORANTHENE	1.897	1.935	2.034
C775	BENZO(A)PYRENE*	1.729	1.657	-4.134
C780	INDENO(1,2,3-CD)PYRENE	1.493	1.430	-4.206
C785	DIBENZO(A,H)ANTHRACENE	1.367	1.329	-2.829
C790	BENZO(G,H,I)PERYLENE	1.344	1.325	-1.434

CALIBRATION CHECK - SEMIVOLATILE HSL COMPOUNDS

CASE NO. 4992 CONTRACT LAB: GSRI

CONTRACT NO. 68-01-6959 INSTRUMENT IDENTIFIER: FINN-02

CALIBRATION DATE: 10/03/85

STANDARD FILE: SS100785A

DATE: 10/07/85 TIME: 11:33

MAXIMUM % D FOR CCC IS 20

	COMPOUND	MEAN RF(I)	RF(O)	% D
C310	N-NITROSODIMETHYLAMINE	0.676	0.692	2.364
C315	PHENOL	1.570	1.577	0.422
C320	ANILINE	1.318	0.463	-64.856 — LOQ
C325	BIS(2 CHLOROETHYL)ETHE	1.307	1.306	-0.056
C330	2-CHLOROPHENOL	1.273	1.279	0.427
C335	1,3-DICHLOROBENZENE	1.442	1.472	2.095
C340	1,4-DICHLOROBENZENE*	1.531	1.577	3.028
C345	BENZYL ALCOHOL	0.839	0.775	-7.554
C350	1,2-DICHLOROBENZENE	1.426	1.461	2.445
C355	2-METHYLPHENOL	1.215	1.164	-4.210
C360	BIS(2-CHLOROISOPROPYL)	1.501	1.560	3.919
C365	4-METHYLPHENOL	1.371	1.328	-3.115
C370	N-NITROSO-DI-N-PROPYLA	0.238	0.226	-5.204
C375	HEXACHLOROETHANE	0.549	0.562	2.301
C410	NITROBENZENE	0.307	0.336	9.457
C415	ISOPHORONE	0.599	0.618	3.121
C420	2-NITROPHENOL*	0.228	0.209	-8.445
C425	2,4-DIMETHYLPHENOL	0.296	0.284	-4.004
C430	BENZOIC ACID	0.205	0.224	9.403
C435	BIS(2-CHLOROETHOXY)MET	0.408	0.427	4.742
C440	2,4-DICHLOROPHENOL*	0.292	0.299	2.479
C445	1,2,4-TRICHLOROBENZENE	0.308	0.324	5.268
C450	NAPHTHALENE	0.923	0.986	6.788
C455	4-CHLOROANILINE	0.212	0.047	-77.553 — DL.
C460	HEXACHLOROBUTADIENE*	0.138	0.160	15.323
C465	4-CHLORO-3-METHYLPHENO	0.270	0.259	-3.818
C470	2-METHYLNAPHTHALENE	0.564	0.550	-2.366
C510	HEXACHLOROCYCLOPENTADI	0.283	0.315	11.122
C515	2,4,6-TRICHLOROPHENOL*	0.401	0.403	0.385
C520	2,4,5-TRICHLOROPHENOL	0.347	0.417	20.174
C525	2-CHLORONAPHTHALENE	1.161	1.212	4.436
C530	2-NITROANILINE	0.427	0.417	-2.296
C535	DIMETHYL PHTHALATE	1.264	1.328	5.027
C540	ACENAPHTHYLENE	1.721	1.792	4.148
C545	3-NITROANILINE	0.158	0.025	-84.101 — DL.
C550	ACENAPTHENE*	1.128	1.184	4.936
C555	2,4-DINITROPHENOL	0.189	0.203	7.308
C560	4-NITROPHENOL**	0.089	0.132	47.419 — LOQ
C565	DIBENZOFURAN	1.589	1.743	9.711

D.L unreliable 4-chloroaniline & 3-nitroaniline CC283 & CC284.

Form VII

CALIBRATION CHECK - SEMIVOLATILE HSL COMPOUNDS

CASE NO. 4992 CONTRACT LAB: GSRI

CONTRACT NO. 68-01-6959 INSTRUMENT IDENTIFIER: FINN-02

CALIBRATION DATE: 10/03/85

STANDARD FILE: SS100785A

DATE: 10/07/85 TIME: 11:33

MAXIMUM % D FOR CCC IS 20

	COMPOUND	MEAN RF(I)	RF(O)	% D	
C570	2,4-DINITROTOLUENE	0.410	0.430	4.917	
C575	2,6-DINITROTOLUENE	0.338	0.342	1.432	
C580	DIETHYL PHTHALATE	1.209	1.277	5.609	
C585	4-CHLOROPHENYL PHENYL	0.595	0.637	7.021	
C590	FLUORENE	1.331	1.446	8.671	
C595	4-NITROANILINE	0.197	0.229	16.393	
C610	4,6-DINITRO-2-METHYLPH	0.126	0.120	-4.697	
C615	N-NITROSODIPHENYLAMINE	0.410	0.301	-26.444	CCC Violation
C625	4-BROMOPHENYL PHENYL E	0.194	0.197	1.329	
C630	HEXACHLOROBENZENE	0.232	0.261	12.455	
C635	PENTACHLOROPHENOL*	0.136	0.183	34.657	CCC Violation
C640	PHENANTHRENE	1.007	0.992	-1.479	
C645	ANTHRACENE	0.897	0.923	2.882	
C650	DI-N-BUTYL PHTHALATE	1.110	1.168	5.239	
C655	FLUORANTHENE*	0.928	1.059	14.065	
C710	BENZIDINE	0.066	0.050	-24.217	
C715	PYRENE	1.608	1.425	-11.356	
C720	BUTYL BENZYL PHTHALATE	0.782	0.677	-13.355	
C725	3,3'-DICHLOROBENZIDINE	0.308	0.346	12.191	
C730	BENZO(A)ANTHRACENE	1.223	1.191	-2.564	
C735	BIS(2-ETHYLHEXYL)PHTHA	1.083	0.956	-11.699	
C740	CHRYSENE	1.135	1.111	-2.144	
C760	DI-N-OCTYL PHTHALATE*	3.182	2.841	-10.731	
C765	BENZO(B)FLUORANTHENE	1.994	2.032	1.900	
C770	BENZO(K)FLUORANTHENE	1.897	1.773	-6.526	
C775	BENZO(A)PYRENE*	1.729	1.652	-4.427	
C780	INDENO(1,2,3-CD)PYRENE	1.493	1.525	2.139	
C785	DIBENZO(A,H)ANTHRACENE	1.367	1.421	3.945	
C790	BENZO(G,H,I)PERYLENE	1.344	1.412	5.062	

Form VII

gsri GULF SOUTH RESEARCH INSTITUTE
Post Office Box 26518 New Orleans, Louisiana 70186 Telephone 504 283-4223

January 17, 1986

Mr. Rock Vitale
NUS Corporation
992 Old Eagle School Road
Suite 196
Wayne, Pennsylvania 19087

Subject: EPA Contract No. 68-01-6959
GSRI Project No. 3280-3008
Case No. 4992

Dear Mr. Vitale:

At your request, we have reviewed data for vinyl chloride in sample CC-277 from case 4992. GC/MS data are enclosed.

As you can see, vinyl chloride appears to be present, but barely above the noise level.

If you have further questions, please call us.

Very truly yours,

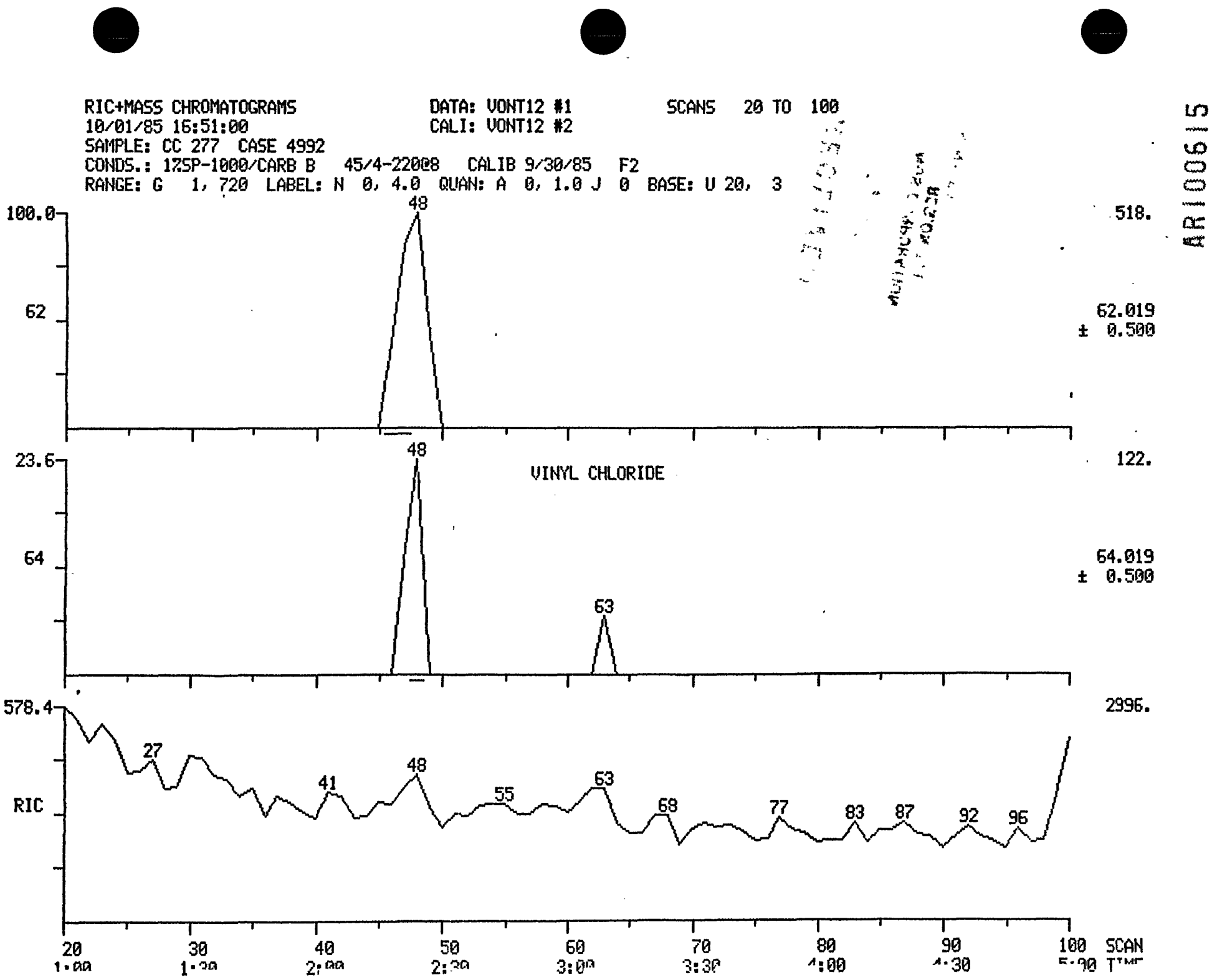
Richard R. Whitney, Ph.D.
Senior Research Chemist

RRW/vmy
Enclosures

cc: Linda Boynton, EPA Sample Management Office
Patricia Krantz, EPA Region III
Data Audit Staff, EPA Las Vegas

RECEIVED
JAN 20 1986
NUS CORPORATION
REGION III
SENT TO

AR100614

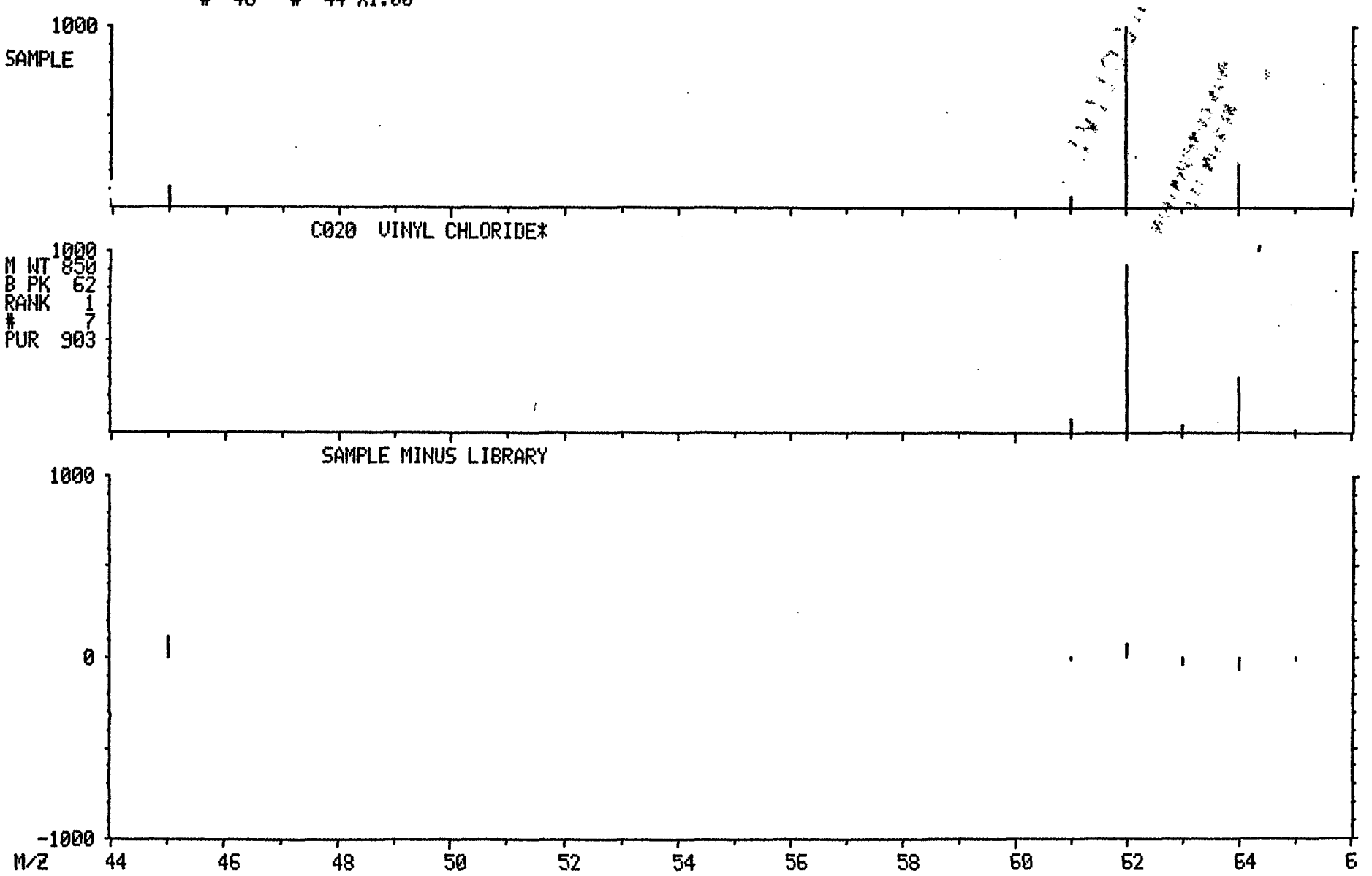

RIC+MASS CHROMATOGRAMS
10/01/85 16:51:00
SAMPLE: CC 277 CASE 4992
CONDS.: 17SP-1000/CARB B 45/4-2200 CALIB 9/30/85 F2
RANGE: G 1, 720 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3
DATA: VONT12 #1
CALI: VONT12 #2
SCANS 20 TO 100
AR100615
100.0
62
48
518.
62.019
± 0.500
23.6
64
48
63
VINYL CHLORIDE
122.
64.019
± 0.500
578.4
RIC
27
41
48
55
63
68
77
83
87
92
96
2996.
20
30
40
50
60
70
80
90
100
SCAN

LIBRARY SEARCH
10/01/85 16:51:00 + 2:24
SAMPLE: CC 277 CASE 4992
CONDS.: 1ZSP-1000/CARB B 45/4-220@8 CALIB 9/30/85 F2
48 - # 44 X1.00

DATA: VONT12 # 48
CALI: VONT12 # 2

BASE M/Z: 62
RIC: 730.

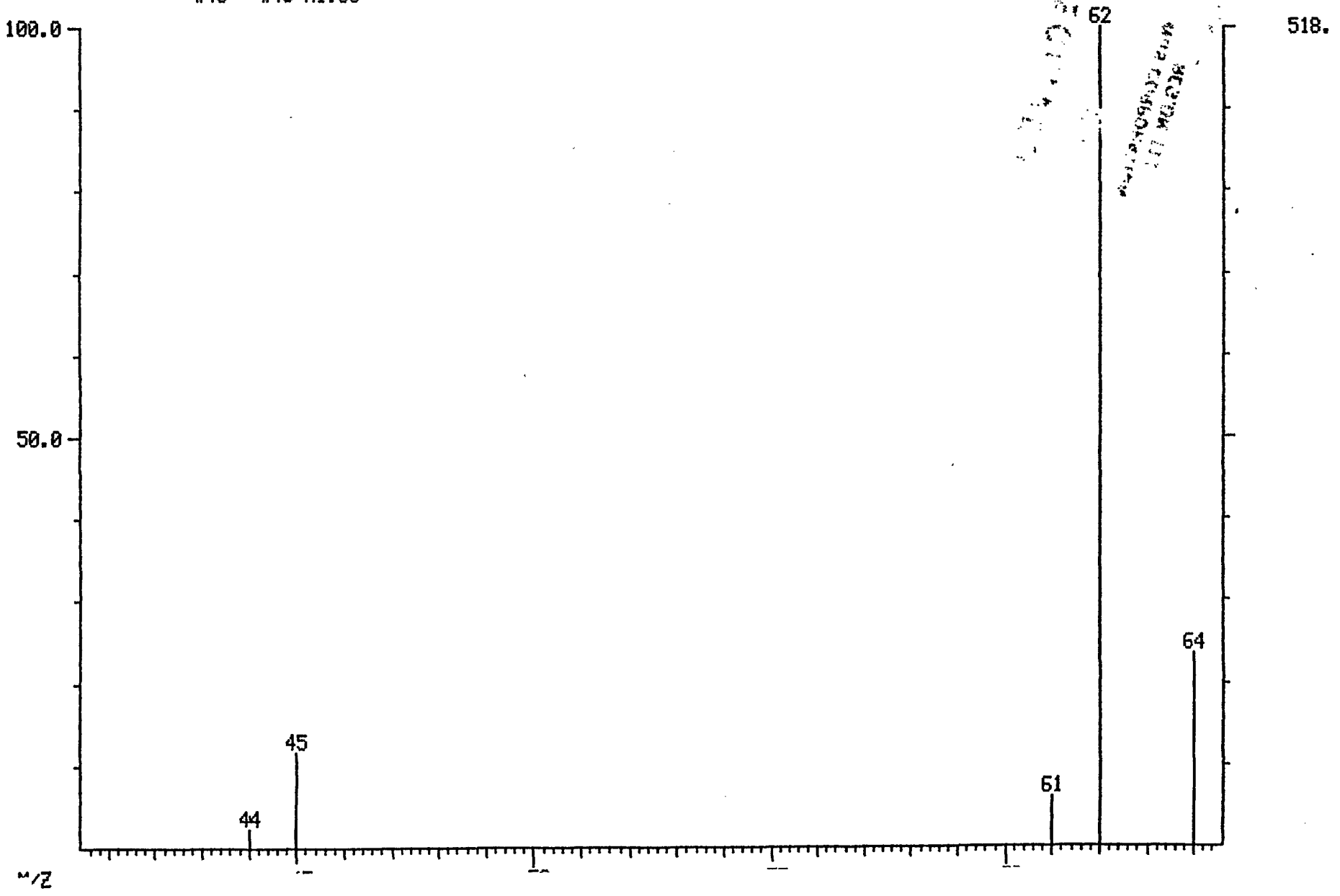
AR100616



MASS SPECTRUM
10/01/85 16:51:00 + 2:24
SAMPLE: CC 277 CASE 4992
CONDS.: 1%SP-1000/CARB B 45/4-220@8 CALIB 9/30/85 F2
GC TEMP: 51 DEG. C
#48 - #43 X1.00

DATA: VONT12 #48
CALI: VONT12 #2

BASE M/Z: 62
RIC: 743.



AR100617

Sample Number
CC-270

ORGANICS ANALYSIS DATA SHEET

(Page 1)

Laboratory Name: G S R I
Lab Sample ID No: VONT01
Sample Matrix: WATER
Data Release Authorized By:

Case No: 4992
QC Report No: 148
Contract No: 68-01-6959
Date Sample Received: 09/28/85

VOLATILE COMPOUNDS

Concentration: LOW
Date Extracted/Prepared: 10/02/85
Date Analyzed: 10/02/85
Conc/Dil Factor: 1. pH 4.44
Percent Moisture: (Not Decanted) N/A

CAS Number		UG/L	CAS Number		UG/L
74-87-3	Chloromethane	10. U	79-34-5	1,1,2,2-Tetrachloroethane	5.0U
74-83-9	Bromomethane	10. U	78-87-5	1,2-Dichloropropane	5.0U
75-01-4	Vinyl Chloride	10. U	10061-02-6	Trans-1,3-Dichloroproene	5.0U
75-00-3	Chloroethane	10. U	79-01-6	Trichloroethene	5.0U
75-09-2	Methylene Chloride	8.7	124-48-1	Dibromochloromethane	5.0U
67-64-1	Acetone	10. U	79-00-5	1,1,2-Trichloroethane	5.0U
75-15-0	Carbon Disulfide	5.0U	71-43-2	Benzene	5.0U
-35-4	1,1-Dichloroethene	5.0U	10061-01-5	cis-1,3-Dichloropropene	5.0U
-34-3	1,1-Dichloroethane	5.0U	110-75-8	2-Chloroethylvinylether	10. U
156-60-5	Trans-1,2-Dichloroethene	5.0U	75-25-2	Bromoform	5.0U
67-66-3	Chloroform	5.0U	591-78-6	2-Hexanone	10. U
107-06-2	1,2-Dichloroethane	5.0U	108-10-1	4-Methyl-2-Pentanone	10. U
78-93-3	2-Butanone	10. U	127-18-4	Tetrachloroethene	5.0U
71-55-6	1,1,1-Trichloroethane	5.0U	108-88-3	Toluene	5.0U
56-23-5	Carbon Tetrachloride	5.0U	108-90-7	Chlorobenzene	5.0U
108-05-4	Vinyl Acetate	10. U	100-41-4	Ethylbenzene	5.0U
75-27-4	Bromodichloromethane	5.0U	100-42-5	Styrene	5.0U
				Total Xylenes	5.0U

U - Compound analyzed for but not detected. The reported value is the minimum attainable detection limit for the sample.

See page 1A for complete definitions of the data reporting qualifiers.

Laboratory Name: G S R I
Case No: 4992

Sample Number
CC-270

ORGANICS ANALYSIS DATA SHEET
(Page 2)

SEMIVOLATILE COMPOUNDS

Concentration: LOW
Date Extracted/Prepared: 09/30/85
Date Analyzed: 10/03/85
Conc/Dil Factor: 1.
Percent Moisture: (Decanted) NA

GPC Cleanup ___ Yes _X_ No
Separatory Funnel Extraction ___ Yes
Continuous Liquid-Liquid Extraction _X_ Yes

CAS Number		UG/L	CAS Number		UG/L
62-75-9	N-Nitrosodimethylamine	10. U	208-96-8	Acenaphthylene	10. U
108-95-2	Phenol	10. U	99-09-2	3-Nitroaniline	50. U
62-53-3	Aniline	10. U	83-32-9	Acenaphthene	10. U
111-44-4	bis(2-Chloroethyl)Ether	10. U	51-28-5	2,4-Dinitrophenol	50. U
95-57-8	2-Chlorophenol	10. U	100-02-7	4-Nitrophenol	50. U
541-73-1	1,3-Dichlorobenzene	10. U	132-64-9	Dibenzofuran	10. U
106-46-7	1,4-Dichlorobenzene	10. U	121-14-2	2,4-Dinitrotoluene	10. U
100-51-6	Benzyl Alcohol	10. U	606-20-2	2,6-Dinitrotoluene	10. U
95-50-1	1,2-Dichlorobenzene	10. U	84-66-2	Diethylphthalate	10. U
95-48-7	2-Methylphenol	10. U	7005-72-3	4-Chlorophenyl-phenylether	10. U
39638-32-9	bis(2-Chloroisopropyl)Ether	10. U	86-73-7	Fluorene	10. U
106-44-5	4-Methylphenol	10. U	100-01-6	4-Nitroaniline	50. U
621-64-7	N-Nitroso-Di-n-Propylamine	10. U	534-52-1	4,6-Dinitro-2-Methylphenol	50. U
67-72-1	Hexachloroethane	10. U	86-30-6	N-Nitrosodiphenylamine (1)	10. U
98-95-3	Nitrobenzene	10. U	101-55-3	4-Bromophenyl-phenylether	10. U
78-59-1	Isophorone	10. U	118-74-1	Hexachlorobenzene	10. U
88-75-5	2-Nitrophenol	10. U	87-86-5	Pentachlorophenol	50. U
105-67-9	2,4-Dimethylphenol	10. U	85-01-8	Phenanthrene	10. U
65-85-0	Benzoic Acid	50. U	120-12-7	Anthracene	10. U
111-91-1	bis(2-Chloroethoxy)Methane	10. U	84-74-2	Di-n-Butylphthalate	10. U
120-83-2	2,4-Dichlorophenol	10. U	206-44-0	Fluoranthene	10. U
120-82-1	1,2,4-Trichlorobenzene	10. U	92-87-5	Benzidine	50. U
91-20-3	Naphthalene	10. U	129-00-0	Pyrene	10. U
106-47-8	4-Chloroaniline	10. U	85-68-7	Butylbenzylphthalate	10. U
87-68-3	Hexachlorobutadiene	10. U	91-94-1	3,3'-Dichlorobenzidine	20. U
59-50-7	4-Chloro-3-Methylphenol	10. U	56-55-3	Benzo(a)Anthracene	10. U
91-57-6	2-Methylnaphthalene	10. U	117-81-7	bis(2-Ethylhexyl)Phthalate	10. U
77-47-4	Hexachlorocyclopentadiene	10. U	218-01-9	Chrysene	10. U
88-06-2	2,4,6-Trichlorophenol	10. U	117-84-0	Di-n-Octyl Phthalate	10. U
95-95-4	2,4,5-Trichlorophenol	50. U	205-99-2	Benzo(b)Fluoranthene	10. U
91-58-7	2-Chloronaphthalene	10. U	207-08-9	Benzo(k)Fluoranthene	10. U
88-74-4	2-Nitroaniline	50. U	50-32-8	Benzo(a)Pyrene	10. U
131-11-3	Dimethyl Phthalate	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

AR100619

LABORATORY: Gulf South Research Institute
CASE NUMBER: 4992

Sample Number
CC-270

ORGANICS ANALYSIS DATA SHEET

(PAGE 3)

Pesticides/PCBs

Concentration: Low
Date Extracted: SEP 30 85
Date Analyzed: OCT 07 85
Dilution Factor: 1

CAS Number	Pesticide/PCB	Conc. uG/L	
319-84-6	Alpha-BHC	0.050	U
319-85-7	Beta-BHC	0.050	U
319-86-8	Delta-BHC	0.050	U
58-89-9	Gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor Epoxide	0.050	U
959-98-8	Endosulfan I	0.050	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
7421-93-4	Endrin Aldehyde	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
57-74-9	Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	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	1.0	U
11096-82-5	Aroclor-1260	1.0	U

V_s = Volume of Water Extracted (mL)

W_s = Weight of Sample Extraced (g)

V_t = Volume of Total Extract (uL)

V_i = Volume of Extract Injected (uL)

V_s 1000 W_s NA V_t 10000 V_i 2.55

Laboratory Name: Gulf South Research Institute

Case No: 4992

Sample Number: CC-270

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.	110-54-3	Hexane	VOA	369	4.9 J, B
2.	NA	1-Propene, Trichloro	SV	579	6.5 J B
3.	2114-42-3	Cyclohexane, 2-Propenyl	SV	765	8.3 J B
4.	NA	Not Identified	SV	1471	6.7 J
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
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24.					
25.					
26.					
27.					
28.					
29.					
30.					

Sample Number
CC-276

ORGANICS ANALYSIS DATA SHEET

(Page 1)

Laboratory Name: G S R I
Lab Sample ID No: VONT07
Sample Matrix: WATER
Data Release Authorized By:

Case No: 4992
QC Report No: 148
Contract No: 68-01-6959
Date Sample Received: 09/28/85

VOLATILE COMPOUNDS

Concentration: LOW
Date Extracted/Prepared: 10/02/85
Date Analyzed: 10/02/85
Conc/Dil Factor: 1. pH 5.54
Percent Moisture: (Not Decanted) NA

CAS Number		UG/L	CAS Number		UG/L
74-87-3	Chloromethane	10. U	79-34-5	1,1,2,2-Tetrachloroethane	5.0U
74-83-9	Bromomethane	10. U	78-87-5	1,2-Dichloropropane	5.0U
75-01-4	Vinyl Chloride	10. U	10061-02-6	Trans-1,3-Dichloroproene	5.0U
75-00-3	Chloroethane	10. U	79-01-6	Trichloroethene	3.7J
75-09-2	Methylene Chloride	5.0U	124-48-1	Dibromochloromethane	5.0U
67-64-1	Acetone	10. U	79-00-5	1,1,2-Trichloroethane	5.0U
75-15-0	Carbon Disulfide	5.0U	71-43-2	Benzene	5.0U
75-35-4	1,1-Dichloroethene	5.0U	10061-01-5	cis-1,3-Dichloropropene	5.0U
75-34-3	1,1-Dichloroethane	5.0U	110-75-8	2-Chloroethylvinylether	10. U
156-60-5	Trans-1,2-Dichloroethene	3.5J	75-25-2	Bromoform	5.0U
67-66-3	Chloroform	5.0U	591-78-6	2-Hexanone	10. U
107-06-2	1,2-Dichloroethane	5.0U	108-10-1	4-Methyl-2-Pentanone	10. U
78-93-3	2-Butanone	10. U	127-18-4	Tetrachloroethene	5.0U
71-55-6	1,1,1-Trichloroethane	5.0U	108-88-3	Toluene	5.0U
56-23-5	Carbon Tetrachloride	5.0U	108-90-7	Chlorobenzene	5.0U
108-05-4	Vinyl Acetate	10. U	100-41-4	Ethylbenzene	5.0U
75-27-4	Bromodichloromethane	5.0U	100-42-5	Styrene	5.0U
				Total Xylenes	5.0U

J - Reported value is less than the detection limit.
U - Compound analyzed for but not detected. The reported value is the minimum attainable detection limit for the sample.

See page 1A for complete definitions of the data reporting qualifiers.

Laboratory Name: G S R I
Case No: 4992

Sample Number
CC-276

ORGANICS ANALYSIS DATA SHEET
(Page 2)

SEMIVOLATILE COMPOUNDS

Concentration: LOW
Date Extracted/Prepared: 09/30/85
Date Analyzed: 10/03/85
Conc/Dil Factor: 1.
Percent Moisture: (Decanted) NA

GPC Cleanup ___ Yes _X_ No
Separatory Funnel Extraction ___ Yes
Continuous Liquid-Liquid Extraction _X_ Yes

CAS Number		UG/L	CAS Number		UG/L
62-75-9	N-Nitrosodimethylamine	10. U	208-96-8	Acenaphthylene	10. U
108-95-2	Phenol	10. U	99-09-2	3-Nitroaniline	50. U
62-53-3	Aniline	10. U	83-32-9	Acenaphthene	10. U
111-44-4	bis(2-Chloroethyl)Ether	10. U	51-28-5	2,4-Dinitrophenol	50. U
95-57-8	2-Chlorophenol	10. U	100-02-7	4-Nitrophenol	50. U
541-73-1	1,3-Dichlorobenzene	10. U	132-64-9	Dibenzofuran	10. U
106-46-7	1,4-Dichlorobenzene	10. U	121-14-2	2,4-Dinitrotoluene	10. U
100-51-6	Benzyl Alcohol	10. U	606-20-2	2,6-Dinitrotoluene	10. U
95-50-1	1,2-Dichlorobenzene	10. U	84-66-2	Diethylphthalate	10. U
95-48-7	2-Methylphenol	10. U	7005-72-3	4-Chlorophenyl-phenylether	10. U
39638-32-9	bis(2-Chloroisopropyl)Ether	10. U	86-73-7	Fluorene	10. U
106-44-5	4-Methylphenol	10. U	100-01-6	4-Nitroaniline	50. U
621-64-7	N-Nitroso-Di-n-Propylamine	10. U	534-52-1	4,6-Dinitro-2-Methylphenol	50. U
67-72-1	Hexachloroethane	10. U	86-30-6	N-Nitrosodiphenylamine (1)	10. U
98-95-3	Nitrobenzene	10. U	101-55-3	4-Bromophenyl-phenylether	10. U
78-59-1	Isophorone	10. U	118-74-1	Hexachlorobenzene	10. U
88-75-5	2-Nitrophenol	10. U	87-86-5	Pentachlorophenol	50. U
105-67-9	2,4-Dimethylphenol	10. U	85-01-8	Phenanthrene	10. U
65-85-0	Benzoic Acid	50. U	120-12-7	Anthracene	10. U
111-91-1	bis(2-Chloroethoxy)Methane	10. U	84-74-2	Di-n-Butylphthalate	10. U
120-83-2	2,4-Dichlorophenol	10. U	206-44-0	Fluoranthene	10. U
120-82-1	1,2,4-Trichlorobenzene	10. U	92-87-5	Benzidine	50. U
91-20-3	Naphthalene	10. U	129-00-0	Pyrene	10. U
106-47-8	4-Chloroaniline	10. U	85-68-7	Butylbenzylphthalate	10. U
87-68-3	Hexachlorobutadiene	10. U	91-94-1	3,3'-Dichlorobenzidine	20. U
59-50-7	4-Chloro-3-Methylphenol	10. U	56-55-3	Benzo(a)Anthracene	10. U
91-57-6	2-Methylnaphthalene	10. U	117-81-7	bis(2-Ethylhexyl)Phthalate	10. U
77-47-4	Hexachlorocyclopentadiene	10. U	218-01-9	Chrysene	10. U
88-06-2	2,4,6-Trichlorophenol	10. U	117-84-0	Di-n-Octyl Phthalate	10. U
95-95-4	2,4,5-Trichlorophenol	50. U	205-99-2	Benzo(b)Fluoranthene	10. U
91-58-7	2-Chloronaphthalene	10. U	207-08-9	Benzo(k)Fluoranthene	10. U
88-74-4	2-Nitroaniline	50. U	50-32-8	Benzo(a)Pyrene	10. U
131-11-3	Dimethyl Phthalate	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

AR100623

LABORATORY: Gulf South Research Institute
CASE NUMBER: 4992

Sample Number
CC-276

ORGANICS ANALYSIS DATA SHEET

(PAGE 3)

Pesticides/PCBs

Concentration: Low
Date Extracted: SEP 30 85
Date Analyzed: OCT 07 85
Dilution Factor: 1

CAS Number	Pesticide/PCB	Conc. uG/L	
319-84-6	Alpha-BHC	0.050	U
319-85-7	Beta-BHC	0.050	U
319-86-8	Delta-BHC	0.050	U
58-89-9	Gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor Epoxide	0.050	U
959-98-8	Endosulfan I	0.050	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
7421-93-4	Endrin Aldehyde	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
57-74-9	Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	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	1.0	U
11096-82-5	Aroclor-1260	1.0	U

V_S = Volume of Water Extracted (mL)

W_S = Weight of Sample Extraced (g)

V_t = Volume of Total Extract (uL)

V_i = Volume of Extract Injected (uL)

V_S 1000 W_S NA V_t 10000 V_i 2.55

AR100624

Laboratory Name: Gulf South Research Institute

Case No: 4992

Sample Number
CC-276

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.	110-54-3	Hexane	VOA	369	6.2 J,B
2.	105-60-2	2H-Azepin-2-One, Hexahydro	SV	868	1100 J
3.	NA	Not Identified	SV	9676 scans	6.2 J
4.	NA	Not Identified	SV	1480	14 J
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Sample Number
CC-277

ORGANICS ANALYSIS DATA SHEET

(Page 1)

.aboratory Name: G S R I
Lab Sample ID No: VONT12
Sample Matrix: WATER
)ata Release Authorized By:

Case No: 4992
QC Report No: 148
Contract No: 68-01-6959
Date Sample Received: 09/28/85

VOLATILE COMPOUNDS

Concentration: LOW
Date Extracted/Prepared: 10/01/85
Date Analyzed: 10/01/85
Conc/Dil Factor: 1. pH 6.34
Percent Moisture: (Not Decanted) NA

CAS Number		UG/L	CAS Number		UG/L
74-87-3	Chloromethane	10. U	79-34-5	1,1,2,2-Tetrachloroethane	5.0U
74-83-9	Bromomethane	10. U	78-87-5	1,2-Dichloropropane	5.0U
75-01-4	Vinyl Chloride	10. U	10061-02-6	Trans-1,3-Dichloroproene	5.0U
75-00-3	Chloroethane	10. U	79-01-6	Trichloroethene	3.9J
75-09-2	Methylene Chloride	10. B	124-48-1	Dibromochloromethane	5.0U
67-64-1	Acetone	7.9J	79-00-5	1,1,2-Trichloroethane	5.0U
75-15-0	Carbon Disulfide	5.0U	71-43-2	Benzene	1.9J
75-35-4	1,1-Dichloroethene	5.0U	10061-01-5	cis-1,3-Dichloropropene	5.0U
75-34-3	1,1-Dichloroethane	5.0U	110-75-8	2-Chloroethylvinylether	10. U
156-60-5	Trans-1,2-Dichloroethene	8.4	75-25-2	Bromoform	5.0U
67-66-3	Chloroform	5.0U	591-78-6	2-Hexanone	10. U
107-06-2	1,2-Dichloroethane	5.0U	108-10-1	4-Methyl-2-Pentanone	10. U
78-93-3	2-Butanone	10. U	127-18-4	Tetrachloroethene	5.0U
71-55-6	1,1,1-Trichloroethane	5.0U	108-88-3	Toluene	5.0U
56-23-5	Carbon Tetrachloride	5.0U	108-90-7	Chlorobenzene	5.0U
108-05-4	Vinyl Acetate	10. U	100-41-4	Ethylbenzene	5.0U
75-27-4	Bromodichloromethane	5.0U	100-42-5	Styrene	5.0U
				Total Xylenes	5.0U

B - Compound was detected in the QC blank.
J - Reported value is less than the detection limit.
U - Compound analyzed for but not detected. The reported value is the minimum attainable detection limit for the sample.

See page 1A for complete definitions of the data reporting qualifiers.

AR100626

oratory Name: G S R I
ase No: 4992

Sample Number
CC-277

ORGANICS ANALYSIS DATA SHEET
(Page 2)

SEMIVOLATILE COMPOUNDS

Concentration: LOW
Date Extracted/Prepared: 09/30/85
ate Analyzed: 10/03/85
onc/Dil Factor: 1.
Percent Moisture: (Decanted) NA

GPC Cleanup ___ Yes _X_ No
Separatory Funnel Extraction ___ Yes
Continuous Liquid-Liquid Extraction _X_ Yes

AS Number		UG/L	CAS Number		UG/L
62-75-9	N-Nitrosodimethylamine . .	10. U	208-96-8	Acenaphthylene	10. U
108-95-2	Phenol	10. U	99-09-2	3-Nitroaniline	50. U
2-53-3	Aniline	10. U	83-32-9	Acenaphthene	10. U
.11-44-4	bis(2-Chloroethyl)Ether .	10. U	51-28-5	2,4-Dinitrophenol	50. U
95-57-8	2-Chlorophenol	10. U	100-02-7	4-Nitrophenol	50. U
41-73-1	1,3-Dichlorobenzene . . .	10. U	132-64-9	Dibenzofuran	10. U
06-46-7	1,4-Dichlorobenzene . . .	10. U	121-14-2	2,4-Dinitrotoluene	10. U
100-51-6	Benzyl Alcohol	10. U	606-20-2	2,6-Dinitrotoluene	10. U
50-1	1,2-Dichlorobenzene . . .	10. U	84-66-2	Diethylphthalate	10. U
48-7	2-Methylphenol	10. U	7005-72-3	4-Chlorophenyl-phenylether	10. U
838-32-9	bis(2-Chloroisopropyl)Ether	10. U	86-73-7	Fluorene	10. U
106-44-5	4-Methylphenol	10. U	100-01-6	4-Nitroaniline	50. U
21-64-7	N-Nitroso-Di-n-Propylamine	10. U	534-52-1	4,6-Dinitro-2-Methylphenol	50. U
7-72-1	Hexachloroethane	10. U	86-30-6	N-Nitrosodiphenylamine (1)	10. U
98-95-3	Nitrobenzene	10. U	101-55-3	4-Bromophenyl-phenylether	10. U
78-59-1	Isophorone	10. U	118-74-1	Hexachlorobenzene	10. U
3-75-5	2-Nitrophenol	10. U	87-86-5	Pentachlorophenol	50. U
105-67-9	2,4-Dimethylphenol	10. U	85-01-8	Phenanthrene	10. U
65-85-0	Benzoic Acid	50. U	120-12-7	Anthracene	10. U
11-91-1	bis(2-Chloroethoxy)Methane	10. U	84-74-2	Di-n-Butylphthalate . . .	10. U
20-83-2	2,4-Dichlorophenol	10. U	206-44-0	Fluoranthene	10. U
120-82-1	1,2,4-Trichlorobenzene . .	10. U	92-87-5	Benzidine	50. U
91-20-3	Naphthalene	10. U	129-00-0	Pyrene	10. U
06-47-8	4-Chloroaniline	10. U	85-68-7	Butylbenzylphthalate . . .	10. U
87-68-3	Hexachlorobutadiene . . .	10. U	91-94-1	3,3'-Dichlorobenzidine . .	20. U
59-50-7	4-Chloro-3-Methylphenol .	10. U	56-55-3	Benzo(a)Anthracene	10. U
1-57-6	2-Methylnaphthalene . . .	10. U	117-81-7	bis(2-Ethylhexyl)Phthalate	13.
7-47-4	Hexachlorocyclopentadiene	10. U	218-01-9	Chrysene	10. U
88-06-2	2,4,6-Trichlorophenol . .	10. U	117-84-0	Di-n-Octyl Phthalate . . .	10. U
95-95-4	2,4,5-Trichlorophenol . .	50. U	205-99-2	Benzo(b)Fluoranthene . . .	10. U
1-58-7	2-Chloronaphthalene . . .	10. U	207-08-9	Benzo(k)Fluoranthene . . .	10. U
88-74-4	2-Nitroaniline	50. U	50-32-8	Benzo(a)Pyrene	10. U
131-11-3	Dimethyl Phthalate	6.0J	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

AR100627

LABORATORY: Gulf South Research Institute

CASE NUMBER: 4992

Sample Number
CC-277

ORGANICS ANALYSIS DATA SHEET

(PAGE 3)

Pesticides/PCBs

Concentration: Low

Date Extracted: SEP 30 85

Date Analyzed: OCT 07 85

Dilution Factor: 1

CAS Number	Pesticide/PCB	Conc. uG/L	
319-84-6	Alpha-BHC	0.050	U
319-85-7	Beta-BHC	0.050	U
319-86-8	Delta-BHC	0.050	U
58-89-9	Gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor Epoxide	0.050	U
959-98-8	Endosulfan I	0.050	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
7421-93-4	Endrin Aldehyde	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
57-74-9	Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	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	1.0	U
11096-82-5	Aroclor-1260	1.0	U

V_s = Volume of Water Extracted (mL)

W_s = Weight of Sample Extraced (g)

V_t = Volume of Total Extract (uL)

V_i = Volume of Extract Injected (uL)

V_s 1000 W_s NA V_t 10000 V_i 2.55

Laboratory Name: Gulf South Research Institute

Case No: 4992

Sample Number: CC-277

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.	110-54-3	Hexane	VOA	369	12 J, B
2.	105-60-2	2H-Azepin-2-One, Hexahydro	SV	853	120 J
3.	NA	Not Identified	SV	967	19 J
4.	10544-50-0	Sulfur, Mol. (S8)	SV	1220	1500 J
5.	NA	Not Identified	SV	1479	5.1 J
6.	NA	Not Identified	SV	1685	4.3 J
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CASE 5053

ORGANIC SUPPORT DOCUMENTATION

NOT SUPPLIED BY

CRL

DATA VALIDATION SUMMARY--ORGANIC

FYI ✓ ACTION REQUIRED _____

Date 12/13/85
Case No. 5053 SAS No. _____ Site Name Occidental Chemical
Contract Lab NUS Pittsburgh Contract No. 68-01-7022
SMO Sample Nos. CC269, CC271, CC279, CC286, CC287

Reviewer Diana Pickens of Region III Phone FTS 922-3752
301 224-2740

Summary of Samples by Matrix

	Soil/solid	Aqueous	Other
No. @ low level		5	
No. @ med level			
No. @ high level			

	Acceptable	Non-critical Deviations*	Unacceptable*
VOLATILES			
1) GC/MS tuning--BFB	✓		
2) Initial Calibration	✓	missing deliverables	
3) Continuing Calibration	✓		
4) Surrogate Recovery	✓		
5) Matrix Spikes	✓		
6) Reagent Blanks	✓		
7) Analysed within holding times	✓		
SEMI-VOLATILES			
8) GC/MS tuning--DFTPP	✓		
9) Initial Calibration	✓	missing deliverables	
10) Continuing Calibration	✓		
11) Surrogate Recovery	✓		*
12) Matrix Spikes	✓		
13) Reagent Blanks			
14) Extacted/analysed within holding times	✓ **		
PESTICIDES			
15) Instrument Performance	✓		
16) Initial Calibration	✓		
17) Continuing Calibration	✓		
18) Surrogate Recovery	✓		
19) Matrix Spikes	✓		
20) Reagent Blanks	✓		
21) Extracted/analysed within holding times	✓		
OVERALL CASE			
22) Identification of target compounds	✓		
23) Data Completeness		✓ **	

REVIEWER'S COMMENTS:

* ~~1 sample~~ 2 samples reextracted according to non-standard procedures. No data impact. Resolution underway thru DPO.

** Reextractions completed after holding times expired

** initial calibration raw data omitted from initial submission

*Deviations itemized on following pages

PROJECT NAME: Occidental Chemical
TDD NO: F3-8506-21

EPA SITE NO.:
REGION: F, TTL

QUALITY ASSURANCE REVIEW OF INORGANIC ANALYTICAL DATA PACKAGE

Case No.: 4992
Contract No.: 68-01-6810
Contract Laboratory: Cal Analytical
Applicable IFB No.: SOW 784
Reviewer: Rock J. Vitale
Review Date: 1/17/86

Applicable Sample No's.:
MCD013, MCD014, MCD025
thru & including MCD038
MCB655, MCB382, MCC386,

The inorganic analytical data for this case has been reviewed. The quality assurance evaluation is summarized in the following table:

Reviewer's Evaluation*	Fraction			
	TASK I ICP or AA METALS	TASK II FURNACE AA METALS	TASK II COLD VAPOR AA MERCURY	TASK III CYANIDE
Acceptable			✓#4	✓#4.
Acceptable with exception(s)	✓#1, #2, #5, #6	✓#1, #2, #3, #4		
Questionable				
Unacceptable				

* Definitions of the evaluation score categories are listed on next page.

This evaluation was based upon an analysis of the review items indicated below:

- ● DATA COMPLETENESS
- ● BLANK ANALYSIS RESULTS
- ● MATRIX SPIKE RESULTS
- ● DUPLICATE ANALYSIS RESULTS
- ◒ STANDARD ADDITIONS RESULTS
- ‡ ● QUANTITATIVE CALCULATIONS
- ● INITIAL CALIBRATION VERIFICATION
- ● CONTINUING CALIBRATION VERIFICATION
- ● INTERFERENCE QC RESULTS
- ≠ ● DETECTION LIMITS RESULTS
- ≠ ● INSTRUMENT SENSITIVITY REPORTS
- ♯ ● HOLDING TIMES

Data review forms are attached for each of the review items indicated above.

≠ No errors noted, no form attached.

◒ Spot Check performed.

Comments: #1 Please see blank analysis documentation.
#2 Please see lab and field duplicate analysis
#3 Please see matrix/spike recoveries
#4 The field blank was used for matrix spikes
#5 Poor results were obtained for serial dilution for CA, BA & Zn.
#6 Can't verify quantitative accuracy of Pb in MCD025.

DATA COMPLETENESS	CONC./ MATRIX	LO/AQ									LO/SO	LO/SO			LO/AQ
	TRAFFIC REPORT # MC	D013	D014	D025	D026	D027	D028	D029	D030	D033	D034	D035	D037	D038	B645
	LAB I.D. # P29	27	21	28	22	29	25	30	24	31	25	17	18	19	26
FIELD QC	BLANK														✓
	DUPLICATE														✓
	SPIKE														✓
TASK I: ICAP OR AA: METALS	RAW DATA	✓													
	TAB. RESULTS	✓													
	TAB. D.L.'s	✓													
	QA FORM	✓													
	ICAR INTER. QC	✓													
	INSTR. SENS.	✓													
TASK II: FURNACE AA: METALS	RAW DATA	✓													
	TAB. RESULTS	✓													
	TAB. D.L.'s	✓													
	QA FORM	✓													
	INSTR. SENS.	✓													
TASK II: COLD VAPOR AA: MERCURY	RAW DATA	✓													
	TAB. RESULTS	✓													
	TAB. D.L.'s	✓													
	QA FORM	✓													
	INSTR. SENS.	✓													
TASK III: CYANIDE	RAW DATA	✓	N/R	✓	N/R	✓	N/R	✓	N/R	✓	N/R	✓	→	→	→
	TAB. RESULTS	✓	↓	✓	↓	✓	↓	✓	↓	✓	↓	✓	→	→	→
	TAB. D.L.'s	✓	↓	✓	↓	✓	↓	✓	↓	✓	↓	✓	→	→	→
	QA FORM.	✓	↓	✓	↓	✓	↓	✓	↓	✓	↓	✓	→	→	→
	INSTR. SENS.	✓	↓	✓	↓	✓	↓	✓	↓	✓	↓	✓	→	→	→
OTHER (SPECIFY):	RAW DATA														
	TAB. RESULTS														
	TAB. D.L.'s														
	QA FORM														
	INSTR. SENS.														
OTHER (SPECIFY):	RAW DATA														
	TAB. RUSULTS														
	TAB. D.L.'s														
	QA FORM														
	INSTR. SENS.														

COMMENTS: LAB Matrix spiked duped A Field blank

DATA COMPLETENESS	CONC./ MATRIX	w/AQ	w/Sol	→
	TRAFFIC REPORT # MC	C382	C386	C394
	LAB I.D. # P29	20	15	16
FIELD QC	BLANK	✓	✓	
	DUPLICATE			✓✓W035
	SPIKE			
TASK I: ICAP OR AA: METALS	RAW DATA	✓	→	→
	TAB. RESULTS	✓	→	→
	TAB. D.L.'s	✓	→	→
	QA FORM	✓	→	→
	ICAP INTER. QC	✓	→	→
	INSTR. SENS.	✓	→	→
TASK II: FURNACE AA: METALS	RAW DATA	✓	→	→
	TAB. RESULTS	✓	→	→
	TAB. D.L.'s	✓	→	→
	QA FORM	✓	→	→
	INSTR. SENS.	✓	→	→
TASK II: COLD VAPOR AA: MERCURY	RAW DATA	✓	→	→
	TAB. RESULTS	✓	→	→
	TAB. D.L.'s	✓	→	→
	QA FORM	✓	→	→
	INSTR. SENS.	✓	→	→
TASK III: CYANIDE	RAW DATA	N/A	✓	✓
	TAB. RESULTS		✓	✓
	TAB. D.L.'s		✓	✓
	QA FORM.		✓	✓
	INSTR. SENS.	↓	✓	✓
OTHER (SPECIFY):	RAW DATA			
	TAB. RESULTS			
	TAB. D.L.'s			
	QA FORM			
	INSTR. SENS.			
OTHER (SPECIFY):	RAW DATA			
	TAB. RUSULTS			
	TAB. D.L.'s			
	QA FORM			
	INSTR. SENS.			

COMMENTS: _____

AR100634

DATA EVALUATION SCORE CATEGORIES

ACCEPTABLE: Data is within established control limits, or the data which is outside established control limits does not affect the validity of the analytical results.

ACCEPTABLE WITH EXCEPTION(S): Data is not completely within established control limits. The deficiences are identified and specific data is still valid, given certain qualifications which are listed below.

QUESTIONABLE: Data is not within established control limits. The deficiences bring the validity of the entire data set into question. However, the data validity is neither proved nor disproved by the available information.

UNACCEPTABLE: Data is not within established control limits. The deficiences imply the results are not meaningful.

AR100635

BLANK ANALYSIS RESULTS

TASK	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT
All	field/cw/sol			MCC386 P2915	NUS	Ag (3ug/L/10) #2/ Al (149ug/L/200) #2/ K (1856ug/L/5000) #2/ Na (800ug/L/5000) #2/ Zn (6.3ug/L/1.0) #2/
All	* filtered field/cw/aq			MCC382 P2920	NUS	Ca (637ug/L/5000) #2/ 3185/1593 filter Fe (44.7ug/L/100) #1/ Na (535ug/L/5000) #1 Zn (8.2ug/L/1.0) #1 41/20.5 filtered Pb (4.7ug/L/5) #2/ 23.5/11.8 filtered.
All	field/cw/aq			MCB655 P2926	NUS	~~Cu (2.5ug/L/50) #2/ 125/6.25~~ K (354ug/L/5000) #2/ Na (47ug/L/5000) #2/ Zn (7.3ug/L/1.0) #2/ 36.5/18.3 ~~Pb (3.2ug/L/3) #2/ 16/8.0~~
All	cont cal/ws/aq			CCB	Cal Anal.	Ag (3.3ug/L/10) #2/ 16.5/8.3 K (2,300ug/L/5000) #2/ 11,500/5750 Fe (86.9ug/L/100) #2/ 435/217.3

LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHIN SAMPLE ANALYTICAL DATA SUMMARY.

COMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM RAW DATA

* Only used to question filtered sample results.

BLANK ANALYSIS RESULTS

TASK	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT
All	Initial Cal	Low	AQ	ICB	Cal Anal	N.D.
All	Cont Cal	Low	AQ	CCB	Cal Anal.	Ag (2.3 ug/L / 10) #2 Al (149 ug/L / 200) #2 Fe2 (75 ug/L / 100) #2 K (1200 ug/L / 5000) #1
All	Prep	Low	AQ	Prep,	Cal Anal.	Al (149 ug/L / 200) #2 Cu (3 ug/L / 50) #2 15/7.5 Fe (10 ug/L / 100) #2
All	Cont Cal	Low	AQ	CCB	Cal Anal.	Al (149 ug/L / 200) #2
All	Cont Cal	Low	AQ	CCB	Cal Anal.	Al (205 ug/L / 200) #2 1025/512.5 Fe (10.3 ug/L / 100) #2
All	Prep	Low	AQ	Prep,	Cal Anal.	Al (204.3 ug/L / 200) #2 Fe (10 ug/L / 100) #2 Pb (3.7 ug/L / 5) #1 18.5/9.3
All	Prep	Low	Soil	Prep$_2$	Cal Anal.	Ag (1.3 ug/L / 10) #2 Al (148 ug/L / 200) #2 K (2100 ug/L / 5000) #2 ~~10500/5250~~ Na (8200 ug/L / 5000) #2 4100/2050 Zn (7.0 ug/L / 10) #2

LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHIN SAMPLE ANALYTICAL DATA SUMMARY.

COMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM RAW DATA

FORM V
QC REPT NUMBER: 4992
SPIKE SAMPLE RECOVERY

LAB NAME: CALIF. ANAL. LABS.

CASE NO.: 4992
EPA SAMPLE #:MCB655
LAB SAMPLE #:P2926

DATE: 10/23/85
MATRIX: LOW WATER

UNITS: UG/L

COMPOUNDS METALS:	CONTROL LIMIT % R	SPIKED SAMPLE RESULT (SSR)	SAMPLE RESULT (SR)	SPIKED ADDED (SA)	% R
ELEMENTS..METHOD					
1. ALUMINIUM...P	75 TO 125	1963	0	2000	98
2. ANTIMONY....P	75 TO 125	565.1	0	600	94
3. ARSENIC.....F	75 TO 125	20.8	0	20	104
4. BARIUM......P	75 TO 125	1826	0	2000	91
5. BERYLLIUM...P	75 TO 125	46.8	0	50	94
6. CADMIUM.....P	75 TO 125	53.6	0	50	107
7. CALCIUM.....P	75 TO 125	90730	0	100000	91
8. CHROMIUM....P	75 TO 125	176.7	0	200	88
9. COBALT......P	75 TO 125	437	0	500	87
10.COPPER......P	75 TO 125	230.8	0	250	92
11.IRON........P	75 TO 125	926.6	0	1000 500	93
12.LEAD........F	75 TO 125	26.3	0	20	132R
13.MAGNESIUM...P	75 TO 125	43650	0	50000	87
14.MANGANESE...P	75 TO 125	171	0	200	86
15.MERCURY....CV	75 TO 125	1	0	1	100
16.NICKEL......P	75 TO 125	360.2	0	400	90
17.POTASSIUM...P	75 TO 125	46550	0	50000	93
18.SELENIUM....F	75 TO 125	12.6	0	10	126R
19.SILVER......P	75 TO 125	40.2	0	50	80
20.SODIUM......P	75 TO 125	95470	0	100000	95
21.THALLIUM....F	75 TO 125	46.9	0	50	94
22.TIN.........P	75 TO 125	357.2	0	400	89
23.VANADIUM....P	75 TO 125	441	0	500	88
24.ZINC........P	75 TO 125	194	0	200	97
25.CYANIDE.....C	75 TO 125	88.3	0	100	88

COMMENTS:

This is a field blk.! This contractually unacceptable. The chain of ~~the~~ custody was examed & this sample has been designated a field blk to the lab.

5C

FORM V
QC REPT NUMBER: 4992
SPIKE SAMPLE RECOVERY

LAB NAME: CALIF. ANAL. LABS.

CASE NO.: 4992
EPA SAMPLE #:MCC394
LAB SAMPLE #: P2916

DATE: 10/23/85
MATRIX: LOW SOIL

UNITS: UG/L

COMPOUNDS METALS:		CONTROL LIMIT % R	SPIKED SAMPLE RESULT (SSR)	SAMPLE RESULT (SR)	SPIKED ADDED (SA)	% R
ELEMENTS..METHOD						
1. ALUMINIUM...	P	75 TO 125	N/R	N/R		
2. ANTIMONY....	P	75 TO 125	450.8	0	600	75 ✓
3. ARSENIC.....	F	75 TO 125	61.6	29.5	40	80 ✓
4. BARIUM.....	P	75 TO 125	2123	238.7	2000	94 ✓
5. BERYLLIUM...	P	75 TO 125	51	0	50	102 ✓
6. CADMIUM.....	P	75 TO 125	59.1	0	50	118 ✓
7. CALCIUM.....	P	75 TO 125	N/R	N/R		
8. CHROMIUM....	P	75 TO 125	220.6	30.1	200	95 ✓
9. COBALT.....	P	75 TO 125	469.9	0	500	94 ✓
10. COPPER.....	P	75 TO 125	271	32.8	250	95 ✓
11. IRON.....	P	75 TO 125	N/R	N/R		
12. LEAD.....	F	75 TO 125	54.9	81.1	20	OR [1]
13. MAGNESIUM...	P	75 TO 125	N/R	N/R		
14. MANGANESE...	P	75 TO 125	779.7	308.4	500	94
15. MERCURY....	CV	75 TO 125	1.8	0.95	1	85
16. NICKEL.....	P	75 TO 125	479.4	0	500	96
17. POTASSIUM...	P	75 TO 125	N/R	N/R		
18. SELENIUM....	F	75 TO 125	8.5	0	10	85
19. SILVER.....	P	75 TO 125	49	0	50	98
20. SODIUM.....	P	75 TO 125	N/R	N/R		
21. THALLIUM....	F	75 TO 125	43.1	0	50	86
22. TIN.....	P	75 TO 125	457.4	0	500	91
23. VANADIUM....	P	75 TO 125	523.8	59.8	500	93
24. ZINC.....	P	75 TO 125	609.1	94.1	500	103
25. CYANIDE.....	C	75 TO 125	99.5	0	100	100

COMMENTS:

[1] A precision problem - not accuracy use dup value - 77% recovery is obtain - addressed as an estimate for precision

FORM VI
QC REPORT NUMBER: 4992
DUPLICATE SAMPLE RECOVERY

LAB NAME: CALIF. ANAL. LABS.

CASE NO.: 4992
EPA SAMPLE NO.: MCB655
LAB SAMPLE NO.: P2926

DATE: 10/23/85
MATRIX: LOW WATER

UNITS: UG/L

COMPOUNDS METALS:	CONTROL LIMIT	SAMPLE(S)	DUPLICATES(D)	RPD
ELEMENTS..METHOD				
1. ALUMINIUM...P		0	0	NC
2. ANTIMONY....P		0	0	NC
3.ARSENIC.....F		0	0	NC
4. BARIUM.....P		0	0	NC
5. BERYLLIUM...P		0	0	NC
6. CADMIUM.....P		0	0	NC
7. CALCIUM.....P		0	0	NC
8. CHROMIUM....P		0	0	NC
9. COBALT.....P		0	0	NC
10.COPPER.....P		0	0	NC
11.IRON.....P		0	0	NC
12.LEAD.....F		0	0	NC
13.MAGNESIUM...P		0	0	NC
14.MANGANESE...P		0	0	NC
15.MERCURY....CV		0	0	NC
16.NICKEL.....P		0	0	NC
17.POTASSIUM...P		0	0	NC
18.SELENIUM....F		0	0	NC
19.SILVER.....P		0	0	NC
20.SODIUM.....P		0	0	NC
21.THALLIUM....F		0	0	NC
22.TIN.....P		0	0	NC
23.VANADIUM....P		0	0	NC
24.ZINC.....P		0	0	NC
25.CYANIDE.....C		0	0	NC

COMMENTS:

field blk - unacceptable.

(60

FM VI
QC REPT NUMBER: 4992
DUPLICATE SAMPLE RECOVERY

LAB NAME: CALIF. ANAL. LABS.

CASE NO.: 4992
EPA SAMPLE NO.:MCC394
LAB SAMPLE NO.:P2916

DATE: 10/23/85
MATRIX: LOW SOIL

UNITS: UG/L

COMPOUNDS METALS:	CONTROL SAMPLE(S) LIMIT	DUPLICATES(D)	RPD
ELEMENTS..METHOD			
1. ALUMINIUM...P	9315	9313	0
2. ANTIMONY....P	0	0	NC
3. ARSENIC.....F	29.5	32.9	11 ✓ok
4. BARIUM......P	238.7	248.1	4
5. BERYLLIUM...P	0	0	NC
6. CADMIUM.....P	0	5.5 [1]	NC
7. CALCIUM.....P	5246	5218	1
8. CHROMIUM....P	30.1	27.4	9
9. COBALT......P	0	0	NC
10.COPPER......P	32.8	32	2
11.IRON........P	12050	10770	11
12.LEAD........F	81.1	39.6	69* [2]
13.MAGNESIUM...P	0	0	NC
14.MANGANESE...P	308.4	312.7	1
15.MERCURY....CV	0.95	0.8	17
16.NICKEL......P	0	0	NC
17.POTASSIUM...P	0	0	NC
18.SELENIUM....F	0	0	NC
19.SILVER......P	0	0	NC
20.SODIUM......P	0	0	NC
21.THALLIUM....F	0	0	NC
22.TIN.........P	0	0	NC
23.VANADIUM....P	59.8	63	5
24.ZINC........P	94.1	92.1	2
25.CYANIDE.....C	0	0	NC

COMMENTS:

[1] Possibility cd in MCC394 - but not commented since the orig - ND - & the field dup - ND
[2] Pb extremely - poor lab precision

AR100641

Duplicate/Triplicate Analysis of Non-Matrix Spiked (Indigenous) Compounds

Outliers are tabulated below for three types of multiple analyses:

(1) Field duplicates MCD035 & MCC394

(2) Un-spiked laboratory duplicates

(3) Matrix spike duplicate plus corresponding unspiked sample evaluated for non-matrix spiked (indigenous) compounds. (Spike recoveries are evaluated on a separate form.)

	Outlier Criteria (for tabulation purposes only)			
	Relative standard deviation		Equivalent Relative Percent Difference	
	solid	aqueous	solid	aqueous
			~~4~~ 30%	

CONSTITUENT	CONCENTRATIONS Analysis No. 1 SAMPLE I.D.	CONC.	Analysis No. 2 SAMPLE I.D.	CONC.	Analysis No. 3 SAMPLE I.D.	CONC.	relative standard deviation — or — relative percent difference	concentration units	footnotes
aluminum	MCD035	6199	MCC394	7165			15%		#1
arsenic		24		22.7			6%		#1
barium		176		184			5%		#1, #2
beryllium		1.9		1.6			17%		#1
calcium		6929		4035			53%		#2
chromium		19		23			19%		#1
cobalt		7		10			35%		#2
copper		20		23			14%		#1
iron		6580		9269			34%		#2
lead		17.4		62.4			113%		#3, #2
magnesium		1098		968			12%		#1
manganese		249		237			5%		#1
mercury		0.60		0.70			15%		#1
potassium		1757		1758			—		#1
sodium		862		919			6.4%		#1
vanadium		40.2		46			13%		#1
zinc	✓	61	✓	72			17%		#1

COMMENTS: #1 Within acceptable criteria

#2 Consider both values estimated

#3 MCC394 by MSA w/poor correlation coef.

FORM II

QC Report No.: 4992

INITIAL AND CONTINUING CALIBRATION VERIFICATION 3

LAB NAME: Cal Labs CASE NO.: 4992

SOW NO.: 784

DATE:10/11/85 Units: ug/l

COMPOUNDS METALS...METHODS 4	INIT 1 CALI TRUE	INIT CALI FOUND	INIT CALI % R	CONT 2 CALI TRUE	CONT CALI FOUND	CONT CALI % R	CONT CALI FOUND	CONT CALI % R
1. ALUMINUM....P	10000			10000	10030	100	10010	100
2. ANTIMONY....P	10000			10000	9678	97	9689	97
3. ARSENIC.....P	10000			10000	9341	93	9285	93
4. BARIUM......P	1000			1000	939	94	924	92
5. BERYLLIUM...P	200			200	194	97	192	96
6. CADMIUM.....P	1000			1000	1027	103	1019	102
7. CALCIUM.....P	40000			40000	37890	95	37360	93
8. CHROMIUM....P	1000			1000	945	95	936	94
9. COBALT......P	1000			1000	928	93	921	92
10. COPPER.....P	1000			1000	976	98	961	96
11. IRON.......P	10000			10000	9565	96	9434	94
12. LEAD.......P	1000			1000	919	92	900	90
13. MAGNESIUM...P	40000			40000	38140	95	37500	94
14. MANGANESE...P	1000			1000	918	92	905	91
15. MERCURY....CV	3			3				
16. NICKEL.....P	1000			1000	941	94	914	91
17. POTASSIUM...P	40000			40000	39160	98	39810	100
18. SELENIUM....P	10000			10000	9267	93	9319	93
19. SILVER.....P	100			100	96	96	98	98
20. SODIUM.....P	40000			40000	40340	101	39480	99
21. THALLIUM....P	10000			10000	9821	98	9728	97
22. TIN.......P	10000			10000	9450	95	9341	93
23. VANADIUM....P	1000			1000	957	96	946	95
24. ZINC.......P	1000			1000	916	92	918	92
OTHER:								
CYANIDE.....C								

1 Initial Calibration Source: EPA,SPEX AND OTHERS
2 Continuing Calibration Source: EPA,SPEX AND OTHERS
3 Control Limits: Mercury and Tin 80-120; All other compounds 90-110
4 Indicate Analytical Method Used: P-ICP/Flame AA; F-Furnace

Qel acceptable

FORM II

QC Report No.: 4992

INITIAL AND CONTINUING CALIBRATION VERIFICATION 3

LAB NAME: Cal Labs CASE NO.: 4992

SOW NO.: 784

DATE:10/11/85 Units: ug/l

COMPOUNDS METALS...METHODS 4	INIT 1 CALI TRUE	INIT CALI FOUND	INIT CALI % R	CONT 2 CALI TRUE	CONT CALI FOUND	CONT CALI % R	CONT CALI FOUND	CONT CALI % R
1. ALUMINUM....P	10000	10260	103	10000	10030	100	9895	99
2. ANTIMONY....P	10000	10150	102	10000	9754	98	9450	95
3. ARSENIC.....P	10000	10430	104	10000	9641	96	9246	92
4. BARIUM.....P	1000	982	98	1000	956	96	927	93
5. BERYLLIUM...P	200	210	105	200	198	99	193	97
6. CADMIUM.....P	1000	1063	106	1000	1044	104	1013	101
7. CALCIUM.....P	40000	40290	101	40000	38440	96	37600	94
8. CHROMIUM....P	1000	1008	101	1000	960	96	941	94
9. COBALT.....P	1000	993	99	1000	938	94	916	92
10. COPPER.....P	1000	999	100	1000	992	99	965	97
11. IRON.....P	10000	10080	101	10000	9679	97	9447	94
12. LEAD.....P	1000	971	97	1000	924	92	910	91
13. MAGNESIUM...P	40000	39340	98	40000	38970	97	37810	95
14. MANGANESE...P	1000	977	98	1000	936	94	911	91
15. MERCURY....CV	3			3				
16. NICKEL.....P	1000	990	99	1000	952	95	922	92
17. POTASSIUM...P	40000	38510	96	40000	39150	98	39220	98
18. SELENIUM....P	10000	10140	101	10000	9421	94	9062	91
19. SILVER.....P	100	100	100	100	96	96	97	97
20. SODIUM.....P	40000	39680	99	40000	41430	104	39890	100
21. THALLIUM....P	10000	9948	99	10000	9959	100	9710	97
22. TIN.....P	10000	11420	114	10000	10000	100	9317	93
23. VANADIUM....P	1000	1013	101	1000	972	97	953	95
24. ZINC.....P	1000	963	96	1000	920	92	897	90
OTHER:								
CYANIDE.....C								

1 Initial Calibration Source: EPA,SPEX AND OTHERS
2 Continuing Calibration Source: EPA,SPEX AND OTHERS
3 Control Limits: Mercury and Tin 80-120; All other compounds 90-110
4 Indicate Analytical Method Used: P-ICP/Flame AA; F-Furnace

All acceptable

Form VIII

Q.C. Report No. 4992

STANDARD ADDITION RESULTS

LAB NAME CAL LABS CASE NO. 4992

DATE 10-18-85 UNITS mg/l

Sample #	Element	0 ADD ABS.	1 ADD CON./ABS.[1]	2 ADD CON./ABS.[1]	3 ADD CON./ABS.[1]	FINAL CON.[2]	r*
12916 Y3 MEC 394	Pb	.086	10/.123	20/.161	30/.183	81.1	.9935
P2930 MED029	Pb	.101	10/.127	20/.140	30/.149	67.3	.9704

[1] CON is the concentration added, ABS. is the instrument readout in absorbance or concentration.

[2] Concentration as determined by MSA

both flagged as estmated since CorCoef outside criteria.

* "r" is the correlation coefficient.

+ - correlation coefficient is outside of control window of 0.995.

FORM IV

QC Report No.:

ICP INTERFERENCE CHECK SAMPLE

LAB NAME: Cal Labs

DATE:10/11/85

Case No.: 4992 (4992)

Check Sample ID: X-84 QASL-UNLV

Check Sample Source: EPA

Units: ug/l

COMPOUNDS	CONTROL LIMITS 1	INITIAL			FINAL	
METALS:		TRUE 2	OBSERVED	% R	OBSERVED	% R
1. ALUMINUM....P		448000	448400	100	424500	95
2. ANTIMONY....P						
3. ARSENIC.....P						
4. BARIUM......P		464	489	105	457	98
5. BERYLLIUM...P		412	460	112	415	101
6. CADMIUM.....P		840	893	106	853	102
7. CALCIUM.....P		445000	506700	114	457100	103
8. CHROMIUM....P		705	697	99	639	91
9. COBALT......P		549	542	99	503	92
10. COPPER.....P		553	487	88	463	84
11. IRON.....P		422000	396300	94	379600	90
12. LEAD.....P			970		902	
13. MAGNESIUM...P		425000	438400	103	412900	97
14. MANGANESE...P		617	622	101	573	93
15. MERCURY....CV						
16. NICKEL.....P		890	884	99	829	93
17. POTASSIUM...P						
18. SELENIUM....P						
19. SILVER.....P						
20. SODIUM.....P			275		345	
21. THALLIUM....F						
22. TIN.....P						
23. VANADIUM....P		508	501	99	464	91
24. ZINC.....P		874	890	102	853	98
OTHER:						

2 True value of EPA ICP Interference Check Sample or contractor standard.
1 Mean value based on N=5

Pb is MCD025 can't verify since Pb was quantitated by ICP. It should be noted >85ppb was found by GF.

Form VII

Q.C. Report No. 4992

INSTRUMENT DETECTION LIMITS AND

LABORATORY CONTROL SAMPLE

LAB NAME CAL LABS CASE NO. 4992

DATE 10-11-85 LCS UNITS (ug/L) mg/kg

(Circle One)

Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection Limits (IDL)-ug/l ICP/AA	Instrument Detection Limits (IDL)-ug/l Furnace	Lab Control Sample True	Lab Control Sample Found	Lab Control Sample %R
Metals:						
1. Aluminum	200	187		10000	9811	98
2. Antimony	60	23		10000	9450	95
3. Arsenic	10	32	9.3	10000	9259	93
4. Barium	200	11		1000	919	92
5. Beryllium	5	0.40		200	192	96
6. Cadmium	5	4.8		1000	1009	101
7. Calcium	5000	298		40000	37630	94
8. Chromium	10	2.4		1000	933	93
9. Cobalt	50	4.0		1000	907	91
10. Copper	25	2.6		1000	956	96
11. Iron	100	8.0		10000	9448	94
12. Lead	5	41	3.2	1000	884	83
13. Magnesium	5000	197		40000	37850	95
14. Manganese	15	1.1		1000	[illegible]	90
15. Mercury	0.2		0.07			
16. Nickel	40	24		1000	928	93
17. Potassium	5000	542		40000	39120	98
18. Selenium	5	66	2.1	10000	9231	92
19. Silver	10	2.1		100	99.2	99
20. Sodium	5000	367		40000	39970	100
21. Thallium	10	56	3.2	10000	9674	97
22. Tin	40	60		10000	9343	93
23. Vanadium	50	3.1		1000	940	94
24. Zinc	20	2.6		1000	893	89
Other:						
Cyanide	10		1.5			

AR100647

PROJECT NAME: Occidental Chemical
TDD NO: F3-8509-06

EPA SITE NO.:
REGION: III

QUALITY ASSURANCE REVIEW OF INORGANIC ANALYTICAL DATA PACKAGE

Case No.: 5053
Contract No.:
Contract Laboratory: Chemtech
Applicable IFB No.:
Reviewer: Steve Littleton
Review Date: 12-6-85

Applicable Sample No's.:
MCD012, MCD016, MCD032, MCD011, MCD015, MCD031, MCD030, MCD017

The inorganic analytical data for this case has been reviewed. The quality assurance evaluation is summarized in the following table:

Reviewer's Evaluation*	Fraction			
	TASK I ICP or AA METALS	TASK II FURNACE AA METALS	TASK III COLD VAPOR AA MERCURY	TASK III CYANIDE
Acceptable				
Acceptable with exception(s)	2			
Questionable	3	5		
Unacceptable				

Definitions of the evaluation score categories are listed on next page.

This evaluation was based upon an analysis of the review items indicated below:

- ● DATA COMPLETENESS
- ● BLANK ANALYSIS RESULTS
- ● MATRIX SPIKE RESULTS
- ● DUPLICATE ANALYSIS RESULTS
- ● STANDARD ADDITIONS RESULTS
- ● QUANTITATIVE CALCULATIONS
- ● INITIAL CALIBRATION VERIFICATION
- ● CONTINUING CALIBRATION VERIFICATION
- ● INTERFERENCE QC RESULTS
- ● DETECTION LIMITS RESULTS
- ● INSTRUMENT SENSITIVITY REPORTS

Data review forms are attached for each of the review items indicated above.

╪ No errors noted, no form attached.

↻ Spot Check performed.

Comments: [illegible]
3 Duplicate analysis [illegible]
3 Matrix spike [illegible]

DATA EVALUATION SCORE CATEGORIES

ACCEPTABLE: Data is within established control limits, or the data which is outside established control limits does not affect the validity of the analytical results.

ACCEPTABLE WITH EXCEPTION(S): Data is not completely within established control limits. The deficiences are identified and specific data is still valid, given certain qualifications which are listed below.

QUESTIONABLE: Data is not within established control limits. The deficiences bring the validity of the entire data set into question. However, the data validity is neither proved nor disproved by the available information.

UNACCEPTABLE: Data is not within established control limits. The deficiences imply the results are not meaningful.

BLANK ANALYSIS RESULTS

TASK	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT
INOR. I, II, III	FIELD/L/AQ Filtered			MCD 016	NUS	Fe = 113 ug/l Pb = 5.2 ug/l Sm = [illegible] ug/l Zn = 18 ug/l
I, II, III	Field/L/AQ			MCD 015	NUS	Fe = 9 ug/l Sn = 2.5 ug/l Zn = 2.5 ug/l
INOR. I, II, III	LAB PREP/L/AQ				Grab-K	

LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHIN SAMPLE ANALYTICAL DATA SUMMARY.

COMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM RAW DATA

BASED UPON THE ABOVE LISTED CONTAMINANT LEVELS THE FOLLOWING DATA POINTS MAY BE QUESTIONABLE (5X RULE APPLIED):

[illegible]

[illegible]

AR100650

LAB

Duplicate Analysis Results

The applicable duplicate pairs are:

sample no.	MCR015					
Field duplicate						
Lab duplicate						
sample level	L					
sample matrix	AQ					
TASK	I, II, III					

The relative percent difference (RPD) for each parameter group was evaluated. The duplicate analysis RPD acceptance criteria should be:

MATRIX	maximum acceptable Percent Difference
AQ	± 20 %
SOL	± 40 %

The RPD's exceeding the maximum acceptable percent difference were:

MATRIX	Compound	Actual RPD	Sample	Comparison conc.	Comparison conc.
AQ	T.U	111	MCR015	5	9

Comments: _____

AR100651

FIELD

Duplicate Analysis Results

The applicable duplicate pairs are:

sample no.						
Field duplicate						
Lab duplicate						
sample level						
sample matrix						
TASK						

The relative percent difference (RPD) for each parameter group was evaluated. The duplicate analysis RPD acceptance criteria should be:

MATRIX	maximum acceptable Percent Difference
AQ	± 20%
SOL	± 40%

The RPD's exceeding the maximum acceptable percent difference were:

MATRIX	Compound	Actual RPD	Comparison		

Comments: _____

MATRIX SPIKE RECOVERIES

Sample No.	MC0650					
Field Spike						
Lab Spike	✓					
Matrix	(1)					
Conc. Level	L					
Method Std.						
TASK	I, II, III					

All matrix spike recoveries were within the established control ranges specified in;
IFB WA8 -A , Exhibit E, Table 2. ___ Yes ___ No

Exception(s):

Parameter	Accepted Range (%)	Actual % Rec.	Sample Number	Org. Result	Spike Added	Spike Result	Units
As	75-125	52	MC0650	6.4	[illegible]	[illegible]	ug/L
Fe	75-125	64	MC0650	706	1000	1350	ug/L
K	75-125	70	MC[illegible]	(YY)	5000	[illegible]	ug/L
Tl	[illegible]	62	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cu	75-125	57	MC0650	52	[illegible]	130	ug/L

Comments: _____

STANDARD ADDITION RESULTS

ocumentation indicates a standard addition correction was performed on all spiked samples for parameters having recoveries outside of ontrol limits: Yes_____ No_____

or the parameters having poor recoveries in the spiked sample(s), tandard additions were also performed on all other samples where the following conditions were met:

(1) The sample matrix was similar to the matrix of the sample which was spiked; and

(2) The parameters in question were detected with postive results.

Yes___ No____ NOT REQUIRED BY CONTRACT

ne parameters with poor spike recoveries are listed below, along with the type of standard addition performed(none, 1, 2, or 3 point). The results for these parameters in other samples which have a similar atrix are also listed below:

sample	description of matrix	parameter	recovery	type of std. add.
		NA		

C mments: _____

AR100654

Initial Calibration Verification and Continuing Calibration Verification

Documentation indicates calibrations were performed and checked every ten samples: Yes ✓ No_

Exceptions: _____

Calibrations and verifications were all within the control limits specified in

SOW 794 : Yes ✓ No_

Outliers are listed below:

Parameter	Acceptable Range (%)	Calibration Identifier	% of True Value	Comments

Interference QC Results

Documentation indicates interference QC samples were run before and after every ten samples: Yes ✓ No_

Exceptions: RUN AT START and FINISH OF SHIFT AS REQUIRED BY CONTRACT

Interference QC results were all within the control limits specified in

SOW 794 : EPA CRL III guidelines 85 - 115 % Yes ✓ No_

Exceptions:

Parameter	Acceptable Range (%)	Calibration Identifier	% of True Value	Comments

AR100655

Detection Limits Results

Detection limits were reported for all samples analyzed: Yes ✓ No ___

Exceptions: _____

Detection limits were less than or equal to the required detection limits specified in W-7. Yes ___ No ✓

Exceptions: MC0021 analyzed at a 5x dilution, all non-spiked samples were CY detection limit for ICP. Al, Sb, Be, Cr, Co, Mn, K in Soils

Instrument Sensitivity Reports

Instrument sensitivity reports were documented for all parameters:

Yes ___ No ___

Comments: _____

Other Remarks Concerning this Case:

There are currently no established control ranges for ICP interference check standards. However, although not a contractual requirement, 85% - 115% is used here as a tentative guideline for evaluation. Outliers of this tentative control range, if any, are tabulated on the bottom of the preceeding page.

QUANTITATIVE CALCULATIONS

CALCULATION ERRORS AND CORRECTED RESULTS ARE LISTED BELOW:

DATA COMPLETENESS	CONC./ MATRIX	L/A2	L/A2	L/A2	L/A2	L/A2	L/A2	L/A2	L/A2							
	TRAFFIC REPORT #	MCD 018	MCD 016	MCD 038	MCD 011	MCD 015	MCD 031	MCD [illegible]	MCD [illegible]							
	LAB I.D. #	551-01	551-02	551-03	551-04	551-05	551-06	551-07	551-08							
FIELD QC	BLANK		✓			✓										
	DUPLICATE															
	SPIKE															
TASK I: ICAP OR AA: METALS	RAW DATA	✓	→	→	→	→	→	→	→							
	TAB. RESULTS	✓	→	→	→	→	→	→	→							
	TAB. D.L.'s	✓	→	→	→	→	→	→	→							
	QA FORM	✓	→	→	→	→	→	→	→							
	ICAP INTER. QC	✓	→	→	→	→	→	→	→							
	INSTR. SENS.															
TASK II: FURNACE AA: METALS	RAW DATA	✓	→	→	→	→	→	→	→							
	TAB. RESULTS	✓	→	→	→	→	→	→	→							
	TAB. D.L.'s	✓	→	→	→	→	→	→	→							
	QA FORM	✓	→	→	→	→	→	→	→							
	INSTR. SENS.															
TASK II: COLD VAPOR AA: MERCURY	RAW DATA	✓	→	→	→	→	→	→	→							
	TAB. RESULTS	✓	→	→	→	→	→	→	→							
	TAB. D.L.'s	✓	→	→	→	→	→	→	→							
	QA FORM		→	→	→	→	→	→	→							
	INSTR. SENS.															
TASK III: CYANIDE	RAW DATA				✓	→	→	→	→							
	TAB. RESULTS					→	→	→	→							
	TAB. D.L.'s					→	→	→	→							
	QA FORM.					→	→	→	→							
	INSTR. SENS.															
OTHER (SPECIFY):	RAW DATA															
	TAB. RESULTS															
	TAB. D.L.'s															
	QA FORM															
	INSTR. SENS.															
OTHER (SPECIFY):	RAW DATA															
	TAB. RUSULTS															
	TAB. D.L.'s															
	QA FORM															
	INSTR. SENS.															

COMMENTS: _____