Versar INC.

PROPERTY TRANSFER ASSESSMENT:
OLIVER PROPERTY
NORWEGIAN TOWNSHIP
SCHUYLKILL COUNTY, PENNSYLVANIA

PHASE I REPORT

Prepared for:

World Resources Company
Westgate Park
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McLean, Virginia 22102

Prepared by:

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Versar Job No. 6115.36

February 24, 1988

Versar INC.

PROJECT SUMMARY

Versar conducted a property transfer assessment of the Oliver property, including current World Resources Company facilities, in the Township of Norwegian, Schuylkill County, Pennsylvania, on February 10, 1988. This assessment included a review of records, a physical site inspection, and associated research. Based on Versar's investigations, the following key environmental issues have been identified:

- Evidence of past on-site disposal, adjacent to the east wall of the process buildings, was uncovered by facility personnel in the summer of 1987. Analyses of the soil and water samples taken in this area by World Resources personnel indicated the existence of trace organic contamination.

- There is one empty 2,000-gallon underground oil tank located on site. The tank, which is approximately 14 years old, was removed from service in 1987. The tank has never been integrity tested.

- Stains were observed on the concrete floor inside, and gravel outside, the southeast corner of the process buildings. Oil leakage from three air compressors located in this area was observed during the site visit.

- An industrial manufacturing facility, American Copper Company (formerly Cadillac Cable), is located just east of the property boundary. Visual evidence of poor outdoor housekeeping and questionable environmental management practices at the American Copper facility was observed, at a distance, during the Versar site inspection.

Approved for Release:

Bruno Maestri
Director
Hazard Evaluation Division

0440j

Versar INC.

PROPERTY TRANSFER ASSESSMENT

The purpose of this report is to assess the potential environmental concerns related to past and present activities and current conditions at the Oliver property on which the World Resources Company resource recovery facility is located. Mr. Ron Lubcher, Senior Environmental Auditor, and Mr. Steve Campbell, Hydrogeologist, performed the assessment, which included: (1) a visual inspection of the property and its improvements, conducted on February 10, 1988; (2) an interview with Mr. Steven Koop, Technical and Administrative Manager, and Mr. Norwood McCoy, Assistant Technical and Administrative Manager; (3) a review of pertinent records; and (4) contact with appropriate regulatory agencies. The results of Versar's investigations are discussed in the following sections.

I. SITE DESCRIPTION

The subject property is located in Norwegian Township, approximately two miles northwest of the center of Pottsville in Schuylkill County, Pennsylvania. The property consists of two adjacent rectangular parcels of land, each approximately 4.5 acres in size. The World Resources Company Eastern Regional Processing (WRCP) facility is located on parcel No. 1, south of and adjacent to Township Road T-618. The WRCP facility is bounded to the south by parcel No. 2, which consists of undeveloped wooded land, and American Copper Company (formerly Cadillac Cable) to the east. Undeveloped wooded property is located west of the facility. The Pottsville Republican (local daily paper) plant is located approximately one-quarter mile north of the WRCP facility. The closest residences are located approximately one-quarter mile east of the WRCP facility. The location of the WRCP facility and associated property is depicted in Figure 1.

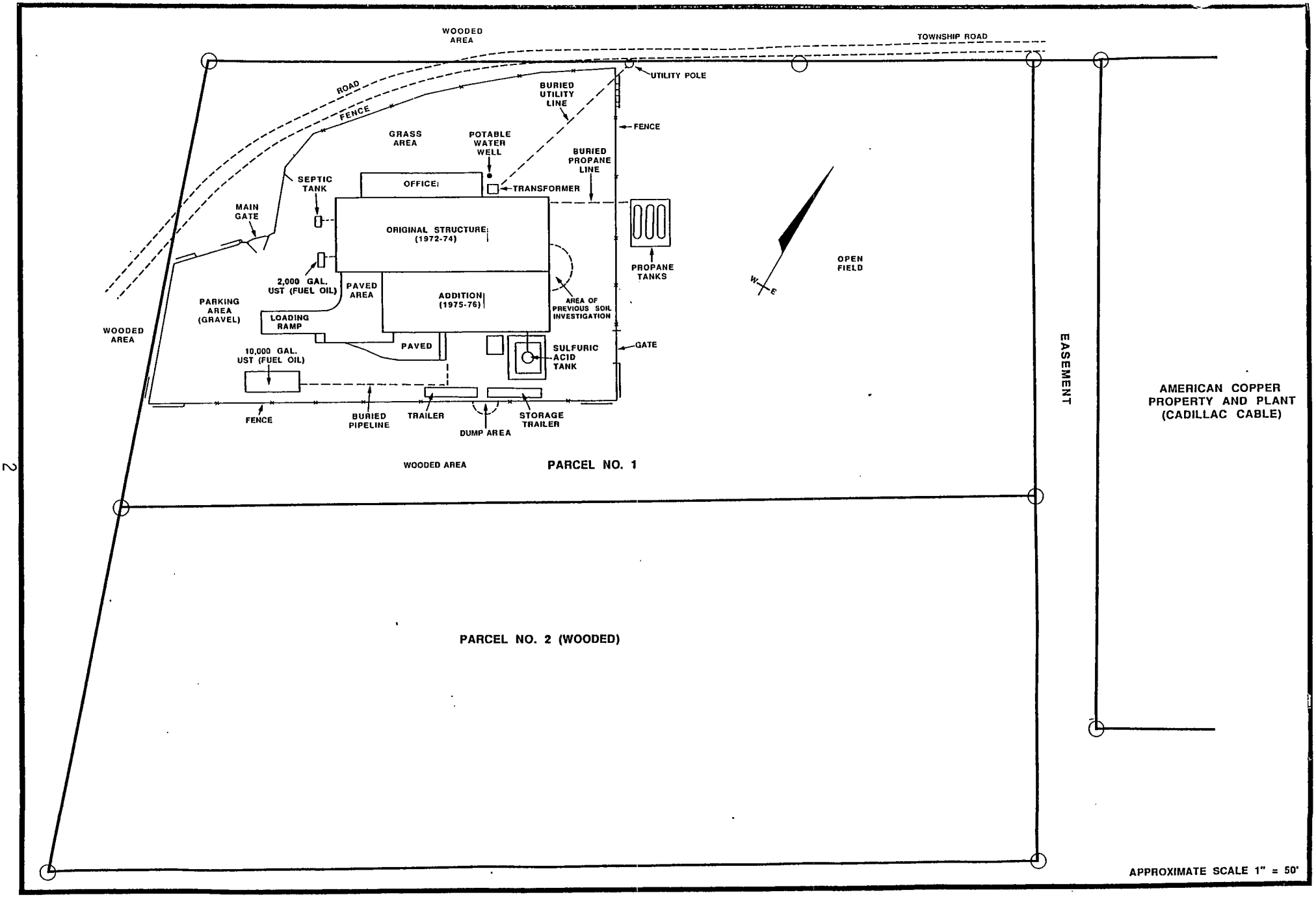


FIGURE 1. LAYOUT OF WORLD RESOURCES AND ADJOINING PROPERTIES

II. ENVIRONMENTAL SETTING

A. Topography and Surface Data

The WRCP facility is located on relatively level ground at an approximate elevation of 860 to 870 feet above sea level. The area immediately surrounding the plant slopes gently to the south-southwest. Runoff from the site (excluding the truck unloading area, from which runoff is controlled) eventually discharges into an unnamed creek located approximately 1,000 feet to the south of the active portion of the facility. The creek discharges into the West Branch of the Schuylkill River at a point approximately one mile southwest of the plant. There are no known uses of the unnamed creek.

B. Site Geology and Groundwater

General information on the site geology and area groundwater is presented in separate sections below. The purpose of this discussion is to provide sufficient information to evaluate the potential for contaminant transport in the subsurface and provide a basis for certain recommendations made in this report. Background information was obtained from a variety of sources, including: geologic maps, published literature, and conversations with local well drillers, local regulatory personnel, and state geologists. Additional investigations into the nature and current uses of groundwater in the immediate vicinity of the WRCP facility are currently in progress.

Geology

The site is located in a relatively complex geologic setting, in an area of highly folded, fractured, and faulted rocks. The plant is situated on the southeast flank of a ridge that represents the surficial expression of a large anticlinal fold in the bedrock. Two significant faults pass within 2,000 feet of the property: the Newtown Fault to the north, and the North Gate Ridge Fault to the south. The site is underlain by the Llewellyn Formation, a sequence of fine to

coarse-grained sandstone, siltstone, and conglomerate deposits interbedded with seams of anthracite coal. The Llewellyn Formation overlies a similar sequence of sediments known as the Pottsville Group. Anthracite coal deposits within the Pottsville Group have been strip-mined extensively in the area immediately surrounding the site. (The principal Pottsville mining complex begins approximately three-quarters of a mile northeast of the site.)

The site is located in the Reading Prong, an area in which radon is frequently detected at levels above human health guidelines set by the U.S. EPA. Site-specific geology dictates the occurrence of rock from which radon is released and the consequent potential for radon accumulation.

There is a well developed soil layer present across undisturbed portions of the site. The soil and subsoil zones may have a combined thickness of as much as 60 inches, consisting of a mixture of sand, silt, clay, and organic matter. The permeability of the soil is reported to be low, allowing for a slow rate of infiltration of precipitation and having an average tendency for runoff.

Groundwater

Very little specific information was available concerning groundwater resources in the immediate area. Much of the greater Pottsville region reportedly receives potable water from a series of reservoirs located south of Pottsville. This includes the towns of Seltzer (located one-half mile to the north), Marlin (three-quarter mile to the southwest), and most likely the residential dwellings located in the vicinity of the facility. Groundwater quality throughout the Pottsville region is reportedly poor due to the impacts from past and current mining activities in the area. Discussions with local well drillers suggest that the Llewellyn Formation, which comprises the bedrock at the site, is often not a reliable source of groundwater. In addition to the limitations imposed by water quality, water yields from wells completed in this formation are generally sufficient only for low volume users.

Groundwater in the vicinity is thought to occur at two levels: a surficial aquifer approximately three feet deep, and a bedrock aquifer at a depth of approximately 300 feet. As a result of the highly fractured and faulted nature of local geologic conditions at the site, these two aquifers may be hydraulically linked; however, evidence to support this hypothesis was not available. The existing water supply well at the WRCP facility was drilled in March 1974 by Kimmer Well Drilling of Orwigsburg, Pennsylvania. The steel-cased well is 300 feet deep with the pump set at a depth of 200 feet. Initial yields from the well were reported to be a modest 10 gallons per minute. The driller remembered the well as being "marginal, not a high yield well." He stated that good water yields in this area were largely dependent on the degree of fracturing present in the rock, and that the vertical/horizontal extent of fracture zones was relatively unpredictable. WRCP personnel monitor the water from the well on a monthly basis for the concentration of several heavy metals; monitoring results indicate that metals were not detected.

In light of the geologic setting, it is difficult to predict the occurrence, depth, and direction of the groundwater flow in the bedrock at the site. This is due to the folded, fractured, and faulted conditions prevalent in the area, as well as the physical characteristics of the deposits that comprise the bedrock.

Groundwater flow in the water table or surficial aquifer is assumed to generally mirror the topography of the property. In this case, the gradient would be to the south, toward the unnamed creek that extends along the south side of the property. The physical properties of the soil allow for seasonal high water tables to within a depth of 18 to 36 inches of the surface during wet periods. Soil borings conducted in conjunction with the investigation of the buried materials along the east side of the WRCP facility (see Section IV) suggest that the depth to groundwater is approximately three feet in some areas. Clay layers encountered at approximately five feet in some of the exploratory holes suggest that the surficial groundwater system may be separated from the

deeper groundwater systems to some degree. The extent of this separation is, however, impossible to predict at the present time.

III. SITE HISTORY

Parcel No. 1 of the subject property was purchased by Theresa P. Oliver from the Greater Pottsville Industrial Development Corporation in 1973; parcel No. 2 was purchased in 1975. Historical records concerning previous owners of the property indicate that the Oliver property was part of a tract of approximately 47 acres of land originally purchased by the Greater Pottsville Industrial Development Corporation from the Kuhl family in 1966. Aerial photographs of the Norwegian Township area indicate that parcel No. 1 was previously used for agricultural purposes prior to development.

Parcel No. 1 was developed by the Oliver organization with the construction of a fabricated steel warehouse building and adjoining office areas. This original structure, which encompasses approximately 8,500 square feet, was used for the manufacture of oil filter housings and steel gates, trading under the name of the Argo Welding Company. Operations reportedly included steel fabrication, welding, sand blasting, and spray painting. In 1975, the manufacturing area was expanded with the construction of a slightly smaller building (7,560 square feet) directly adjacent to and south of the original building. (All improvements are located on parcel No. 1; parcel No. 2 remained undeveloped.) In 1980, Argo Welding Company ceased operations and all major equipment was removed from the buildings. The property and warehouses remained vacant until late 1982, when World Resources leased the space and began construction of a recycling facility. At that time, personnel with World Resources reported finding an assortment of material at the site, presumably left over from previous operations. These materials included: a drum of lacquer thinner, several cans of paint, miscellaneous metal parts, welding rods, and sand blasting sand. These items were removed by the Olivers at WRC's request. The WRCP facility began operating in October 1983.

IV. SITE ASSESSMENT OBSERVATIONS

Versar's inspection of the property included both the interior and exterior building areas and the property perimeter. The building inspection focused primarily on ongoing operations. The exterior inspection consisted of determining, through visual observations, potential environmental release points and the presence of any on-site contamination and/or environmentally sensitive areas. The following sections detail the results of these efforts.

A. Nature of Operations

The WRCP Processing facility is a recycling operation designed to handle, separate, and concentrate F006 wastewater treatment sludges from electroplating operations. These prescreened recyclable materials are transported to the facility under manifest in both bulk, 1 cu. yd. bag, and drum quantities from a variety of generators. Upon arrival at the facility, each shipment of material is visually inspected and analytically tested prior to being off-loaded inside the main process building into a lined recovery area for sampling and debris removal. All chemical processing is performed in the two main process buildings. The recyclable materials are directly introduced into the recycling process by reslurrying the material with a high speed mixer or by introduction to the thermal reduction units. In the hydrometallurgical section of the process, the material is leached by lowering the pH of the slurry with sulfuric acid to dissolve copper and nickel hydroxide. A variety of chemicals (e.g., caustic, sulfides, polymers) are added to the filtrate to achieve the desired oxidation/reduction and physical properties necessary to precipitate and separate the copper and nickel products. The resulting solution is passed through a filter press to recover the desired metal concentrates. The resulting wastewater filtrate (which has been delisted as a hazardous waste) is then stored in holding tanks and either reused as process water or transported off site for disposal at

the nearby Minersville wastewater treatment plant. The concentrates are dried in one of two oil-fired thermal reduction units prior to being blended for off-site shipment to smelter customers.

The WRCP facility receives approximately three shipments of recyclable materials a day for processing, six days a week. The facility operates 24 hours a day, approximately 300 days a year. Facility housekeeping, both indoors and outdoors, appeared to be excellent at the time of the site survey. Facility equipment appeared to be well maintained; however, three oil compressors located in the southeast corner of the rear process building are in need of repair or replacement. Oil leakage was observed, and the concrete floor inside and gravel outside of the building were oil-stained. According to plant management, a new air compressor will be installed in the near future. Additionally, plant management indicated that the facility has also recently reengineered the compressor units to collect the blowdown from the compressors, which in the past was allowed to discharge into the gravel area outside the building.

B. Chemical/Hazardous Material Management

As mentioned above, the facility utilizes a variety of chemicals to achieve the desired classes of metal concentrates. All process chemicals, except sulfuric acid, are stored indoors. Sulfuric acid is stored in a 5,000-gallon above-ground tank located directly outside the process buildings (see Figure 1). Secondary containment for this tank consists of a polyethylene and limestone-lined earthen berm, equipped with a drain valve to remove accumulated water. Piping from the tank into the building is above ground.

All indoor process vessels and storage tanks are situated on XR-5 liner-covered concrete flooring with XR-5-lined concrete curbing, which provides secondary containment for process reactors and chemical and water tanks. Sodium hydroxide is received and stored in DOT-approved tank totes (approximately 300 gallons) and 55-gallon drums, with the building floors and walls providing limited secondary containment.

As previously mentioned, the thermal reduction units are fired with fuel oil. A 10,000-gallon steel underground storage tank was installed last year to supply fuel oil for these dryers. The tank is situated in the southwest corner of the facility's fenced property. According to plant management, this tank is coated and cathodically protected. This tank replaced an inactive 2,000-gallon underground tank that had been in service since the first building was constructed. The tank, situated just outside the western wall of the main process area, is reportedly empty; however, the tank has never been integrity tested. The facility's septic tank and leach field, which receive and treat sanitary waters from facility comfort stations and sinks, are also located in this area.

Primary heating for the facility is provided by propane heaters. Three tanks are located just outside the perimeter fence, with an underground pipe supplying propane to the buildings. According to facility management, there is no asbestos, as insulation or as a constituent in other products, inside the building; where required, styrofoam was used for insulation purposes. Electricity for the buildings is supplied by Pennsylvania Power and Light (PPL), with a transformer substation located outside in the north corner of the fenced property. According to a spokesperson from PPL, the transformer, which is approximately 15 years old, belongs to PPL and has never been tested for PCB content.

C. Exterior Property Inspection

Versar inspected both parcels of land and the surrounding perimeter areas. Approximately two acres of parcel No. 1, which houses the process buildings and offices, are enclosed inside a six-foot high fence topped with barbed wire. Access to the facility is gained through an unmanned gate located along the northeast side of the perimeter fence. The entrance to the facility and the truck receiving areas are lined and paved. The grounds on the north and east of the buildings have been landscaped and are covered with grass. The areas outside of the

buildings slope to the south-southwest. Stormwater runoff from these outdoor areas generally discharges into the wooded areas located to the south and southwest. The back of the facility and the west portion of the fenced areas are covered with gravel. Any runoff water from the truck receiving area is channeled to a collection sump and pumped into the building for use in the recycling process.

The grounds inside the fenced areas appear to be well-maintained. However, as mentioned earlier, minor staining of gravel was observed along the southeast corner of the process buildings near the area of the compressors.

The site property to the south of the perimeter fence is heavily wooded. An old, infrequently used dirt road bisects the area. Evidence located in the wooded area suggests some type of previous use. An abandoned stone cistern found in this area indicates that there may have been a residence (dwelling/farm) on the site at one time. However, no other evidence, such as foundation blocks or building debris, was observed. A small earthen mound, measuring approximately eight feet by six feet, was also located adjacent to and outside of the south perimeter fence, behind two storage trailers (see Figure 1). The pile appears to contain general rubbish and debris, such as beverage containers, scrap metal, and dirt.

The area to the east of the WRCP facility contains wild grasses and scrub bushes. An easement separates the American Copper property from parcels No. 1 and 2. There are several unnatural earthen "mounds" located in the easement. Vegetative overgrowth has made it impossible to determine the composition of these mounds. The mounds each measure approximately two to three feet high, ten feet long, and six feet wide. Inspection of the American Copper property in this area also revealed several wet marsh areas. The ground in these areas was extremely soft and water saturated. The exact source of the aqueous discharge is not known, but the marshy areas were situated immediately to the west of a

manhole access cover. It appears that this discharge may be associated with the septic system serving the American Copper facility.

Although not situated directly adjacent to parcels No. 1 and 2, an area of potential environmental concern is the outdoor drum storage area located on the west parking area of the American Copper company (approximately 25 yards east of the easement). Approximately 100 drums of mostly unlabeled and unmarked drums in advanced stages of deterioration are stored in this area. Although staining of the pavement in this area was observed, there was no visible evidence to indicate that any spillage had migrated to the Oliver property.

D. Previous Environmental Sampling

In the summer of 1987, World Resources personnel discovered an underground pile of used welding rod ends and assorted metal debris. The buried debris was located outside the east wall of the facility, approximately 40 feet from the front of the building (see Figure 1). In November 1987, World Resources personnel attempted to identify the nature of the buried material and the possible extent of any associated contamination. A description of the sampling efforts and associated laboratory analyses is included in Attachment 1. Nine 12-inch diameter holes were drilled in the vicinity of the discovery, to a depth of between two and five and one-half feet. Two of the holes (Nos. 6 and 7) encountered buried debris in the interval between one and three feet below the surface. The debris reportedly consisted of a mixture of welding rod tips, scrap metal, and styrofoam pieces. Water entering these holes was described as having an organic smell.

The extent of the buried debris was located via visual inspection of samples from each of the nine exploratory holes. The area sampled was described as a half circle along the east side of the buildings, having a radius of approximately ten feet and centered on a point approximately 55 feet from the northeast corner of the original building (see

Figure 1). (No determination of the extent of the debris under the concrete floor of the original building was attempted. As previously noted, this building was expanded in 1975.

Eight of the samples taken (six soil and two water) were eventually analyzed for volatile organics in late December 1987. Soil samples taken from hole Nos. 6 and 7 indicated measurable concentrations of toluene (230 ppb), ethylbenzene (50 ppb), and xylenes (140-530 ppb). The concentrations of volatile organics in the remaining soil and water samples were below the detection limits.

The accuracy of the available data is questionable. According to World Resources personnel, established EPA sample preparation, handling, and preservation protocol were not followed during the course of the sampling effort. The sampling effort was for the purpose of determining the potential need for further environmental investigation, according to WRC personnel.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

Based on Versar's review of the information detailed in this report, the potential environmental liabilities associated with the ownership of the Oliver property include: (1) the existence of trace organic soil contamination and the extent of this contamination; (2) the unknown condition of an unused 2,000-gallon underground fuel tank; (3) questionable environmental management and waste storage practices of the neighboring American Copper facility; and (4) oil leakage from the World Resources Processing facility's air compressor units.

In November 1987, World Resources personnel sampled an area of suspect contamination adjacent to the facility's east wall. Established sampling protocol was not followed; however, the results of the analyses indicate the existence of trace nonhalogenated organic solvent contamination. Furthermore, the sampling efforts revealed the presence of shallow groundwater in the area of the soil contamination. The

possible extent of organic contamination in the groundwater is currently unknown. With the exception of the well located at the World Resources facility, there is apparently very little groundwater use in the area. Groundwater in the Pottsville region has been degraded by coal mining operations. The majority of the potable water for the area is supplied by surface reservoirs. However, the shallow aquifer underlying the facility may discharge to a nearby unnamed creek downgradient from the site and may be connected to the deeper bedrock aquifer. Further studies of this shallow aquifer and the existence of any organic contamination appears warranted.

The existence of an inactive 2,000-gallon underground fuel oil tank is another area of concern. This tank, which is approximately 15 years old, has not been actively used since last year. Most of the fuel oil was removed; however, the tank has not been cleaned and fuel oil residues may remain in the tank. The tank has never been integrity tested; potential seepage from this tank could have contaminated nearby soils and groundwater.

The environmental activities of the neighboring American Copper facility also pose a concern for a transfer of the Oliver parcels. Conditions such as inadequate waste drum storage practices, the existence of an unidentified aqueous discharge, and unnatural earthen mounds between the two facilities serve to heighten the concern for the potential of environmental contamination migrating from the American Copper property to the Oliver property. Recent court interpretation of the Pennsylvania Clean Streams Act and other environmental regulations dictate that World Resources should investigate the potential of on-site environmental degradation originating from the American Copper facility.

Oil leakage from the facility's air compressor units is also a minor area of concern. Leakage from the compressor units is evident on the concrete inside and gravel outside of the buildings; however, overall facility housekeeping and maintenance are excellent.

Other minor issues of potential liability regarding the transfer of property ownership include the existence of an untested transformer and the need to evaluate radon levels in the process buildings and offices. Sound environmental management practices dictate that both of these areas be evaluated.

B. Recommendations

To reduce the site's potential from environmental impairment liability, the following actions are recommended.

1. A detailed investigation into potential areas of on-site contamination and an exploration into the existing conditions of the surficial aquifer should be undertaken. Additional soil sampling and analyses should be performed to determine the nature and the extent of the contamination associated with the buried debris located along the east side of the building and in the debris located immediately south of the perimeter fence. Surficial aquifer exploration to determine on-site conditions and the potential impact from the neighboring American Copper facility appear warranted. A detailed description of the recommended investigation is presented in Attachment 2.

2. The inactive underground fuel oil tank should be exhumed because of its age. Soil samples adjacent to and beneath the tank should be collected and analyzed in order to help determine if soil contamination has occurred, as presented in Attachment 2.. If soil samples indicate contamination, further remediation plans should be developed

3. Repair or replacement of the facility's air compressors should be performed in an expeditious manner. Spilled oil both inside and outside of the building should be removed and disposed in a sound environmental manner.

4. Arrangements should be made with Pennsylvania Power and Light to have the on-site electrical transformer tested for PCB content. If the results of the analysis confirm that the transformer contains PCBs or is PCB-contaminated, a routine inspection schedule should be established for the transformers.

5. An investigation into the environmental compliance and spill history of the American Copper (Cadillac Cable) facility should be undertaken by facility personnel.

6. Radon testing should be performed in both process buildings and the office and lab areas because of the geologic location of the facility.

Versar INC.

ATTACHMENT 1

WRC Debris Investigation

U. WORLD RESOURCES W-1 /

Sampling of Soil on the East side of the Building at the Pottsville Recycling Facility

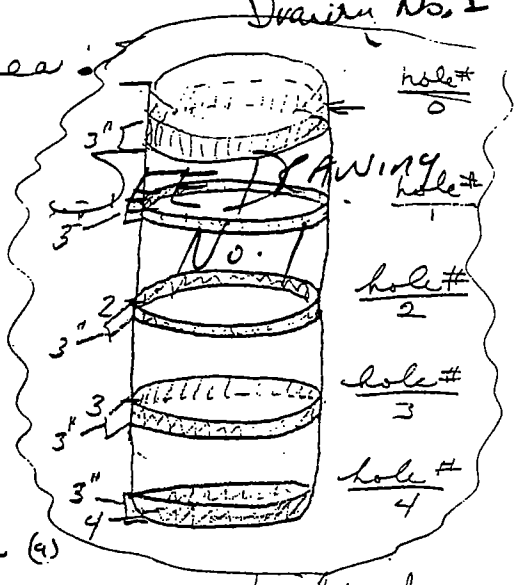
On Sunday, Nov 8, 1987 nine (9) holes of a diameter approximately 12 inches were drilled and samples of each hole were taken. Each hole was scraped from top to bottom 4 times, each of the four scrapings were 90° from the other. These samples were labeled, hole # Number - composite

In addition each hole was sampled at one foot increments starting at ~~0 feet or more precisely~~ one foot below the surface. The labeling system was as follows: hole# 0, hole# 1, hole# 2, hole# 3

hole# 4 the numerator is the hole number being sampled and the denominator is the depth at which the sample was taken. At each one foot depth the sides of

of the hole were scraped around the entire perimeter of the hole over a three (3) inch area.

A Variation to the sampling procedure described above occured in holes Eight (8) and Nine (9). EIGHT (8) AND NINE (9) were drilled only two (2) feet deep and only composite samples were taken. SEE Drawing No 1.



← Description of hole placement.

Number one (1) was drilled 44 feet from the front of the building and 3 feet away from the building, at a depth of 4 feet. All holes used this method of measurement. A 3 digit coordinate system will describe the placement of each hole, eg. hole # Number one (1)

coordinate system describing that hole is (44, 3, 4) where 44 is the distance in feet from the front of building, 3 is distance in feet from the EAST side of the building, AND 4 is the depth in feet of the hole.

Hole No. Identification System

#2 - (39.25, 9, 4)

#3 - (52.5, 10.5, 4)

#4 - (63.5, 4.5, 3.66)

#5 - (58, 9, 3)

#6 - (56, 5.66, 4)

#7 - (52.5, 2.166, 4.5)

#8 - (56, 29, 2)

#9 - (76, 3, 3)

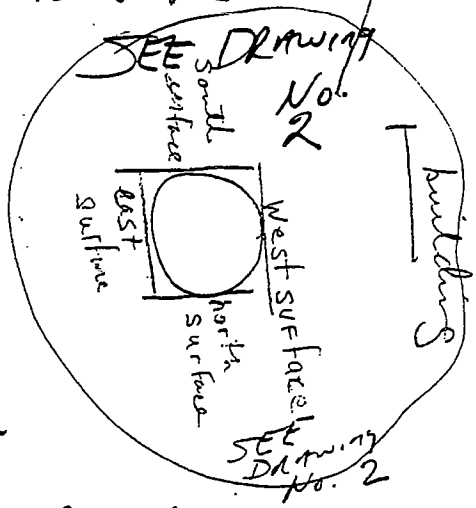
See attached ~~picture~~ drawing showing placement of the holes. The grid is scaled ½' per division. The drawing is not to scale between the front of the building

and the 39' mark.

← Special Remarks about the holes.

(a) Holes 1, 2, 4, 8 AND 9 were dry and without ANY scrap or debris, this is, No observable contamination IN THE HOLES.

(b) Hole #3 - Water slowly leaking into the hole at 3 ft depth from the west surface. Two other wet spots were noticed ON THE WEST SURFACE at 2' and 1.66', but no water leakage. ~~Also for the west surface.~~ Since water was leaking into the hole, ~~two~~ samples were taken at the 4' foot level; one as usual scrapping the entire perimeter at 4 foot level and ANOTHER SAMPLE at ~~the~~ four foot level avoiding the leakage from the 3 foot



level. The wet soil was checked for pH; 5gms of wet soil was placed in 50mls of distilled water (pH 5.44), mixed, and pH tested the pH was 5.67. Therefore no acidity was present.

(c) Hole #5 - This Hole was wet with standing water at the 3' level, but no apparent sign of solvents. One piece of welding rod found at the 1 foot level.

(d) Hole #6 - Hole was drilled to approximately 5½ at which point the drill would not penetrate easily any further. Clay was caked on the end of drill bit when drill was removed from hole. Therefore it was concluded that the depth of contamination is not greater than five & one-half feet deep.

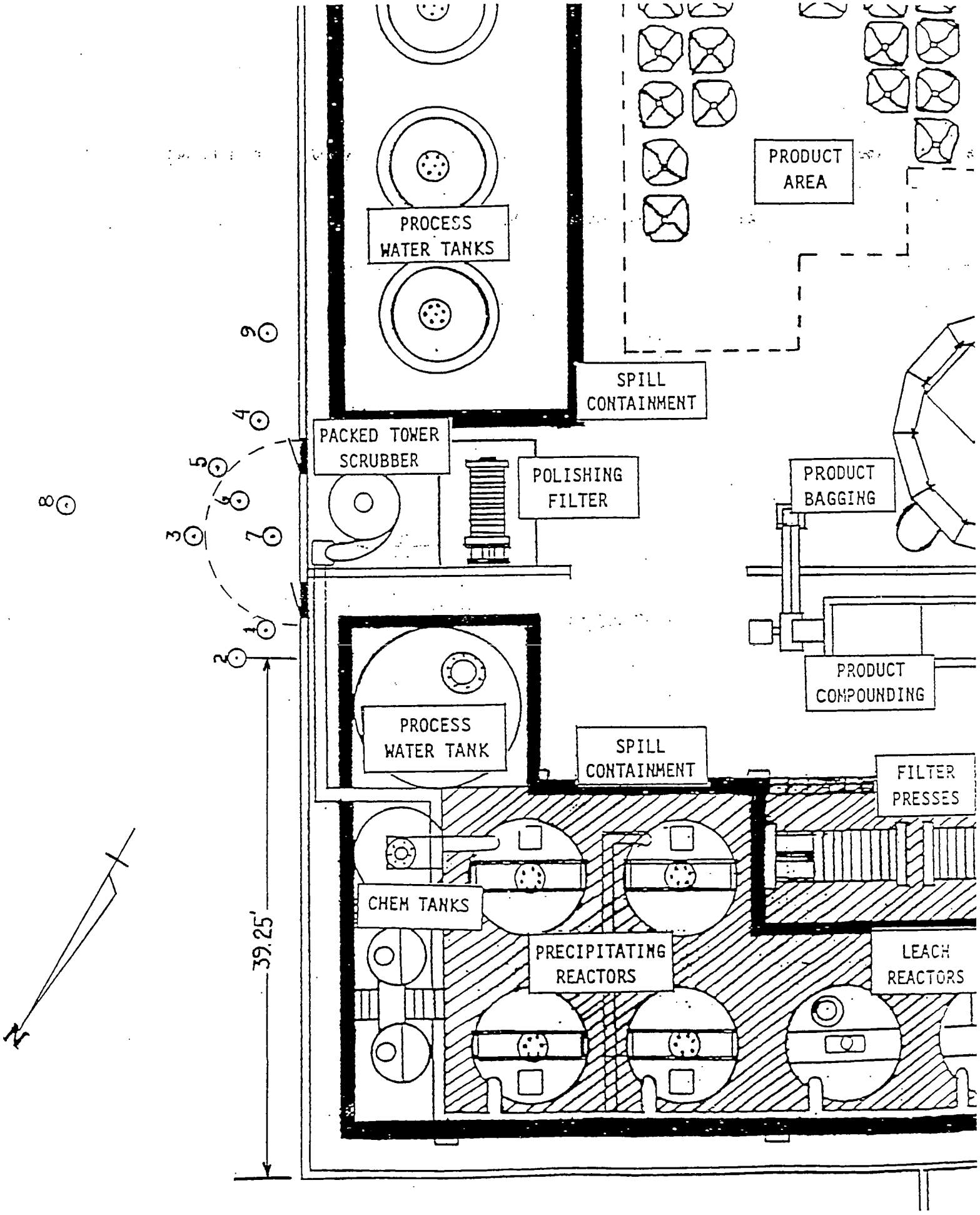
Between 1' and 3', large quantities of welding rod, metal scrap and styrofoam were found. The was wet throughout with water running into the hole at 3 feet. The standing water had a organic film and had an organic smell. Sample 6-1 is a sample of the standing water, skimming the surface of the water to collect as much organic as possible. A hundred gallons of water was taken out of the hole and a second sample, Number 6-2 was taken using the same method of collection as 6-1. PH of the water was 5.9

(e) Hole #7 — Was identical to hole #6 except the hole drilled much easier.

and at 5½' no clay was found. To reiterate, between 1 AND 3 feet there was large quantities of welding rod, scrap metal and styrofoam. The water smelled of organics.

Conclusion - composite samples from 1, 3, 4 and 5 should be analyzed to prove that this is the perimeter of the contamination and 6 & 7 should be analyzed for the maximum concentration of contamination. The total area of contamination outside the building (not under the building) is estimated to have a radius of 10 feet from the point 53.5 feet from the front of the building at a depth of

approximately 6' feet and totaling 35 cubic yards of material not including contaminated soil, if any, under the building for which no data was collected. Attached is a map of the sampling area with the contaminated area highlighted in blue. Once the sample results are received, this conclusion should be reviewed.


PROCESS
WATER TANKS
PRODUCT
AREA
SPILL
CONTAINMENT
PACKED TOWER
SCRUBBER
POLISHING
FILTER
PRODUCT
BAGGING
PRODUCT
COMPOUNDING
PROCESS
WATER TANK
SPILL
CONTAINMENT
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CHEM TANKS
PRECIPITATING
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Arizona Testing Laboratories
817 West Madison Street ☐ Phoenix, Arizona 85007 ☐ 602/254-6181

For: World Resources Company
Attn: Ms. Patricia Nelson
8113 West Sherman
Phoenix, Arizon 85043

Date: January 7, 1988

Lab. No.: 664801-03

Marked: See Below

Sample: Soil

Received: 12-30-87

Submitted by: same

REPORT OF LABORATORY TESTS

METHOD 8010/8020

	3/4 Wet	3/4 Dry	6/1
Chloromethane	< 10.	< 10.	< 10. ppb
Bromomethane	< 10.	< 10.	< 10.
Vinyl chloride	< 10.	< 10.	< 10.
Chloroethane	< 10.	< 10.	< 10.
Methylene chloride	< 10.	< 10.	< 10.
1,1-Dichloroethene	< 10.	< 10.	< 10.
1,1-Dichloroethane	< 10.	< 10.	< 10.
trans-1,2-Dichloroethene	< 10.	< 10.	< 10.
Chloroform	< 10.	< 10.	< 10.
1,2-Dichloroethane	< 10.	< 10.	< 10.
1,1,1-Trichloroethane	< 10.	< 10.	< 10.
Carbon tetrachloride	< 10.	< 10.	< 10.
Bromodichloromethane	< 10.	< 10.	< 10.
1,2-Dichloropropane	< 10.	< 10.	< 10.
trans-1,3-Dichloropropene	< 10.	< 10.	< 10.
Trichloroethylene	< 10.	< 10.	< 10.
Dibromochloromethane	< 10.	< 10.	< 10.
1,1,2-Trichloroethane	< 10.	< 10.	< 10.
cis-1,3-Dichloropropene	< 10.	< 10.	< 10.
2-Chloroethylvinyl ether	< 10.	< 10.	< 10.
Bromoform	< 10.	< 10.	< 10.
1,1,2,2-Tetrachloroethane	< 10.	< 10.	< 10.
Tetrachloroethylene	< 10.	< 10.	< 10.
Chlorobenzene	< 10.	< 10.	< 10.
1,3-Dichlorobenzene	< 10.	< 10.	< 10.
1,2-Dichlorobenzene	< 10.	< 10.	< 10.
1,4-Dichlorobenzene	< 10.	< 10.	< 10.
Benzene	< 10.	< 10.	< 10.
Toluene	< 10.	< 10.	< 10.
Ethylbenzene	< 10.	< 10.	< 10.
Xylenes	< 10.	< 10.	< 10.

< = less than

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake

Arizona Testing Laboratories
817 West Madison Street □ Phoenix, Arizona 85007 □ 602/254-6181

For: World Resources Company
Attn: Ms. Patricia Nelson
8113 West Sherman
Phoenix, Arizon 85043

Date: January 7, 1988

Lab. No.: 664804-06

Sample: Soil

Marked: See Below

Received: 12-30-87

Submitted by: same

REPORT OF LABORATORY TESTS

METHOD 8010/8020

	6/2	6/3.5	7/2	
Chloromethane	< 10.	< 10.	< 10.	ppb
Bromomethane	< 10.	< 10.	< 10.	
Vinyl chloride	< 10.	< 10.	< 10.	
Chloroethane	< 10.	< 10.	< 10.	
Methylene chloride	< 10.	< 10.	< 10.	
1,1-Dichloroethene	< 10.	< 10.	< 10.	
1,1-Dichloroethane	< 10.	< 10.	< 10.	
trans-1,2-Dichloroethene	< 10.	< 10.	< 10.	
Chloroform	< 10.	< 10.	< 10.	
1,2-Dichloroethane	< 10.	< 10.	< 10.	
1,1,1-Trichloroethane	< 10.	< 10.	< 10.	
Carbon tetrachloride	< 10.	< 10.	< 10.	
Bromodichloromethane	< 10.	< 10.	< 10.	
1,2-Dichloropropane	< 10.	< 10.	< 10.	
trans-1,3-Dichloropropene	< 10.	< 10.	< 10.	
Trichloroethylene	< 10.	< 10.	< 10.	
Dibromochloromethane	< 10.	< 10.	< 10.	
1,1,2-Trichloroethane	< 10.	< 10.	< 10.	
cis-1,3-Dichloropropene	< 10.	< 10.	< 10.	
2-Chloroethylvinyl ether	< 10.	< 10.	< 10.	
Bromoform	< 10.	< 10.	< 10.	
1,1,2,2-Tetrachloroethane	< 10.	< 10.	< 10.	
Tetrachloroethylene	< 10.	< 10.	< 10.	
Chlorobenzene	< 10.	< 10.	< 10.	
1,3-Dichlorobenzene	< 10.	< 10.	< 10.	
1,2-Dichlorobenzene	< 10.	< 10.	< 10.	
1,4-Dichlorobenzene	< 10.	< 10.	< 10.	
Benzene	< 10.	< 10.	< 10.	
Toluene	< 10.	230.	< 10.	
Ethylbenzene	< 10.	50.	< 10.	
Xylenes	< 10.	140.	< 10.	

< = less than

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake

Light Gas and Inv

67 ppb

Arizona Testing Laboratories
817 West Madison Street □ Phoenix, Arizona 85007 □ 602/254-6181

For: World Resources Company
Attn: Ms. Patricia Nelson
8113 West Sherman
Phoenix, Arizon 85043

Date: January 7, 1988

Lab. No.: 664807-08

Sample: Soil

Marked: See Below

Received: 12-30-87

Submitted by: same

REPORT OF LABORATORY TESTS

METHOD 8010/8020

	7/3	7/4
Chloromethane	< 10.	< 10. ppb
Bromomethane	< 10.	< 10.
Vinyl chloride	< 10.	< 10.
Chloroethane	< 10.	< 10.
Methylene chloride	< 10.	< 10.
1,1-Dichloroethene	< 10.	< 10.
1,1-Dichloroethane	< 10.	< 10.
trans-1,2-Dichloroethene	< 10.	< 10.
Chloroform	< 10.	< 10.
1,2-Dichloroethane	< 10.	< 10.
1,1,1-Trichloroethane	< 10.	< 10.
Carbon tetrachloride	< 10.	< 10.
Bromodichloromethane	< 10.	< 10.
1,2-Dichloropropane	< 10.	< 10.
trans-1,3-Dichloropropene	< 10.	< 10.
Trichloroethylene	< 10.	< 10.
Dibromochloromethane	< 10.	< 10.
1,1,2-Trichloroethane	< 10.	< 10.
cis-1,3-Dichloropropene	< 10.	< 10.
2-Chloroethylvinyl ether	< 10.	< 10.
Bromoform	< 10.	< 10.
1,1,2,2-Tetrachloroethane	< 10.	< 10.
Tetrachloroethylene	< 10.	< 10.
Chlorobenzene	< 10.	< 10.
1,3-Dichlorobenzene	< 10.	< 10.
1,2-Dichlorobenzene	< 10.	< 10.
1,4-Dichlorobenzene	< 10.	< 10.
Benzene	< 10.	< 10.
Toluene	< 10.	< 10.
Ethylbenzene	< 10.	< 10.
Xylenes	200.	530.

< = less than

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake

Versar INC.

ATTACHMENT 2

Recommended Sampling Plan

Versar INC.

RECOMMENDED SAMPLING PLAN

The following is a preliminary recommendation for a program to investigate the potential areas of on-site contamination and an exploration into the existing conditions of the surficial aquifer. Existing data are of limited value and are inadequate to fully characterize on-site contamination.

1. Additional sampling should be conducted to determine the nature and extent of the contamination associated with the buried materials/debris located along the east side of the building. The sampling should consist of the following key items:

- One investigative boring, located inside the building at a point in the general vicinity of the base of the packed tower scrubber, should be performed. The optimum location would be at a point 53.5 feet from the northeast corner of the building and 4 to 6 feet from the exterior of the east wall. Sampling will necessitate penetrating the eight-inch concrete floor. Following penetration, a hand-operated, powered auger can be used to penetrate to a depth of 6 feet, provided there is sufficient clearance. (Other boring devices may be used.) One composite sample of debris will be taken and analyzed for volatile organics. Additionally, if necessary, a composite soil sample of the one-foot interval located directly below the debris layer will also be recovered and analyzed for the same parameters.

- One confirmation boring, located outside the east wall at a point 53.5 feet from the front of the building and 3.5 feet from the wall, should be performed. A composite sample of the buried debris will be recovered and analyzed for volatile organics. A composite soil sample of the one-foot interval located directly below the debris layer will also be recovered and analyzed for the same parameters.

- One composite sample, consisting of debris from both underneath the building and outside the east wall, will be analyzed for EP toxic metals.

2. A preliminary investigation should be conducted in the small dump area located immediately south of the perimeter fence. The investigation should consist of the following key items:

- Two evenly spaced exploratory holes will be dug with a hand shovel. The material will be visually inspected to determine if it is limited to general refuse, as suspected.

- If questionable material is encountered, a composite sample will be recovered and analyzed for volatile organics and EP toxic metals. A second sample of the one-foot interval immediately below the base of the pile will also be taken and analyzed for volatile organics.

3. A groundwater monitoring program should be implemented to evaluate if previous operations at the site or activities on adjoining properties have adversely affected area groundwater. The program should include the following key items:

- Four monitoring wells located in the approximate areas depicted in Figure 2 should be installed. The actual location, depth, and construction of these wells will be finalized following completion of the ongoing hydrogeologic investigation. Each well will provide data on the following items:

  Well No. 1: This well, located along the north perimeter of parcel No. 1, is intended to provide data on background water quality at the site.

  Well No. 2: This well will be located along the east side of parcel No. 1, slightly downgradient from the observed American Copper discharge area.

  Well No. 3: This well is to be located in the area south of the facility to the west of the sulfuric acid tank. It is intended to provide data downgradient from the previously identified burial area. The location of well No. 3 may be shifted to the south as necessary, following the visual inspection of the dump area located south of the perimeter fence.

  Well No. 4: Well No. 4 will be located in a nondisruptive area of the parking lot west of the buildings. It will be positioned downgradient from the septic leach field and abandoned fuel oil tank.

- Following appropriate well installation and development procedures (including confirmation of groundwater flow direction), a groundwater sample will be obtained from each well and analyzed for volatile organics.

4. After the recommended excavation of the underground tank, one soil sample should be taken beneath each end of the tank. The two soil samples should be analyzed for total hydrocarbons. Removal and sampling should be performed in accordance with regulatory certification procedures.