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Phase I
Expanded Site Inspection
for the
Hoffman Landfill Site
(MD-004)
Volume I

September, 1994

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1.0 Introduction

1.1 Authorization

The Maryland Department of the Environment, Waste Management Administration (MDE/WAS) conducted this Phase I Expanded Site Inspection (ESI) under Cooperative Agreement V-993-122-01 with the U.S. Environmental Protection Agency (EPA), Region III. This Phase I ESI was done under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the Superfund Amendments and Reauthorization Act of 1986 (SARA). Additionally, MDE is authorized to perform this study under Title 7, the State Environmental Article.

1.2 Purpose and Scope of Work

The MDE/WAS Environmental Response and Restoration Program, Site Assessment Division was contracted by the U.S. EPA to perform a Phase I ESI of the Hoffman Landfill site (MD-004). The purpose of this study is to collect information concerning the site sufficient to assess the threat posed to human health and the environment, and to determine the need for additional investigation under CERCLA/SARA or other authority. The scope of work included a review of available file information, initial site visits to select sampling locations, preparation of a sampling plan, sampling of waste and environmental media, and review of the analytical data from the collected samples.

1.3 Executive Summary and Conclusions

The Hoffman Landfill site is located about 0.5 mile southeast of the City of Frostburg in Allegany County, Maryland. From 1967-1971, approximately 225,000 tons of municipal and industrial wastes were disposed in the 22-acre Landfill, which is located in an abandoned coal strip mine. Firms disposing of industrial wastes included the Kelly-Springfield Tire Company, Hercules Corporation, PPG Industries, and the Celanese Corporation.

Six buildings are present within 200' of the site, and a seventh is under construction. These buildings include the Frostburg Heights apartment building and an associated nursing home, a Comfort Inn Motel, a bank, and Rish Equipment. Access to the site is unrestricted.

An estimated 17,684 people reside within a four mile radius of the site. About 14,000 persons rely on the Frostburg Municipal System for potable water; this System draws most water from reservoirs that are not within the target distance limit. The remaining residents obtain water from private and municipal wells, and surface water intakes not located along the 15-mile surface water migration pathway for the site.

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The probable point of entry (ppe) for any contaminants from the site is near the outlet for the Hoffman Drainage Tunnel, about 0.5 mile southeast of the site on Braddock Run. The Tunnel drains 17 square miles of mine workings in the region including, perhaps, the Hoffman Landfill.

This study included the collection of samples of on-site soils, of surface water and sediments, and water from private domestic wells. No organic contaminants were detected at levels above EPA health-based benchmarks. High levels of manganese were detected in surface water sediments downstream of the Landfill. However, these high levels are attributed to extensive strip mining and consequent acid mine drainage in the region and not to the Landfill.

2.0 Site Description

The 22-acre Hoffman Landfill site is located just southeast of the City of Frostburg in Allegany County, Maryland.[1] It is adjacent to and may partly underlie the Frostburg Industrial Park on Route 36.

To reach the site from Baltimore (about a three hour drive), proceed as follows: Take I-695 west to exit 16 (I-70 west); follow I-70 west to I-68 west. From I-68 take exit 34 (Route 36 north). Follow Route 36 for less than one mile and turn right onto Village Parkway just beyond the Comfort Inn. Make the first right onto Industrial Park Road; the Landfill is located between this road and Route 36, behind the Comfort Inn (Figures 1 2 & 3)

The site is situated on the 7.5′ U.S. Geological Survey topographic quadrangle for Frostburg, Maryland.[7] The international coordinates of the site are 39°38′30" north latitude by 78°54′30" west longitude. The Maryland Grid Coordinates are 665,333 north by 263,278 east.[1]

The Hoffman Landfill operated from 1967-1971 as part of a demonstration project to determine the feasibility of using abandoned coal strip mines for the deposition of waste.[4]

The waste pit was about 1,900′ long, 50′ wide at the bottom, 110′ wide at the top, and varied in depth from 30-50′. The fill capacity was about 250,000 cubic yards. In addition, during the initial period of operation, a smaller 3,000 yd^3 pit was also filled.[3]

Six buildings are located within 200 feet of the site. These are the Frostburg Heights apartment building and an associated nursing home, Rish Equipment, a small bank, the Comfort Inn Motel and its banquet facility, Majestic Gardens. Two of the buildings, the motel and the apartment building, may partially overlie the fill area. However, engineering studies associated with the apartment building concluded that the actual fill area is 30-50′ to the east.[1] Another building is currently under construction between the bank

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and Rish Equiment. During the initial site visits in October, 1993, a trench was being excavated through the fill area to install a water line to the new building. As a result of this digging, uncovered refuse was present.[8]

The area surrounding the site is rural and commercial, with residential areas nearby in Hoffman, Grahamtown, and Wrights Crossing. The majority of the site is open grassland, and the exact limits of the Landfill are not apparent on the surface. Figure 3 shows the approximate boundary of the Landfill and location of the buildings.

The site is in the Georges Creek Valley, a seven mile wide, northeast trending valley between the high ridges of Big Savage Mountain to the northwest and Dans Mountain to the southeast. It is at an elevation of approximately 2050 feet.[1,2] The site is on the eastern side of a hill that slopes 10-15 degrees down to the east and southeast; overland runoff is generally in these directions. A pond is located about 50 feet southeast of the fill area.

Thirteen monitoring wells, 10 west of the Landfill and three on the fill area were installed about 1971 to monitor groundwater quality. One of the monitoring wells was sampled during the Level III Site Inspection in 1992. None of the wells could be located during this study; they may have been either buried or paved over as a result of construction activities.

The area beneath the Hoffman Landfill is underlain by a varied sedimentary stratigraphy with coal seams (Monongahela Formation) as well as numerous subsurface mines. These mines and possibly the overlying sediments and bedrock are drained by the Hoffman Drainage Tunnel (Sections 3.4 and 3.5).[3] However, if the formations under the site are drained by the Tunnel, the drainage must flow to Borden Shaft where the main Tunnel is located (about one and one-half miles to the southwest), and then "u-turn" and travel the same distance northeast to the outlet for the Tunnel on Braddock Run.[26]

Besides the Hoffman Landfill, three other landfills, Vale Summit I (MD-5) & II, and Cabin Run (MD-3) are also located in the same general area, to the southwest.

2.1 Site Use

Coal was first discovered in the Georges Creek Basin in 1782, and the area became the principal coal-producing region for Maryland.[9] The topographic maps of the area indicate that extensive strip mining and underground mining have occurred.[7]

The site is an abandoned coal strip mine (dates of operation unknown) that was converted to a sanitary landfill in 1967 as part of a demonstation project partially financed by the U.S. Public

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Health Service and carried out by the Maryland Department of Health and Allegany County. Before the mine could be used as a Landfill, it was necessary to obtain sufficient cover material, and to ensure that some kind of liner was present to retard the contamination of groundwater. It was determined that the adjacent spoil earth, which consisted of overburden and reject coal, and material from the walls of the mine might be used as cover material. It was discovered that spoil material breaks down under the weight of earth-moving equipment into a mixture of small-grained sand, silt and clay that made a suitable cover. Also, the bottom of the pit rested on solid rock that was deemed to be relatively impervious since rainwater was present in it.[1]

Because of the experimental nature of the Landfill, several precautions were taken, including: laying a three foot bed of compacted earth (from spoil piles) on the rock bottom to slow infiltration of leachate into the groundwater; installation of 13 monitoring wells; and placement of a boron tracer substance in the Landfill.[1,3]

From about April 1, 1967 to October 31, 1971, the Landfill accepted municipal waste, including garbage, other refuse, and sewage sludge from the County. It is estimated that about 225,000 tons of waste were disposed at the Landfill when it was active. The amount of waste disposed increased annually. In 1967, between 20-60 tons per day were disposed into the Landfill. By 1971, this quantity had increased to 200-275 tons per day.[3]

During the third year of operation, industrial waste disposal began at the Landfill. Companies known to have disposed of wastes include the Hercules and Celanese Corporations, PPG Industries, and the Kelly-Springfield Tire Company.[1,2,3] It was the policy of the operators to not accept hazardous wastes, although no clear definition of hazardous was given. Wastes included asbestos, solvents, epoxy-resins, fiberglass, activators, paints/pigments, Carbon Black, rubber, and chromium.[10,11] A fact sheet on Carbon Black is given in Appendix B.

The site was originally owned by the Pittsburgh Consolidation Coal Company. In 1963, Maryland Coal and Realty bought the land; this firm is now known as the Allegany Coal and Land Company.[1] As of this study, the site property has several owners. The names, addresses, and a copy of the state taxation and assessment map are given in Appendix D.

2.2 Permits and Regulatory Actions

No State Refuse Disposal Permit was issued for this Landfill. The Landfill, which operated from early 1967 to October 31, 1971, was designed as an experimental landfill to determine the feasibility of using abandoned coal strip mines for the disposal of solid

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waste.[4] The landfill demonstration project was partially financed by the U.S. Public Health Service and carried out in part by the Maryland Department of Health & Mental Hygiene.

2.3 Removal Actions

Recently a water line was installed for a new building adjacent to the Landfill. The exposed debris was removed, clean fill was placed in the trench, and the surface graded.[11]

3.0 Environmental Setting

3.1 Water Supply

A complex water supply system is in operation in this part of Allegany County. The residents within a four-mile radius of the site obtain drinking water from springs and municipal wells, surface water intakes, and private domestic wells.

Information on the municipal systems is given below, and the location of these systems is included on the topographic map.

[redacted]

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[redacted]

The total target population served by the wells located in each distance ring is given below:

Distance of Ring from the Site	Persons served by Private Wells	Persons served by Municipal Wells	Total Population Served
0 - 1/4	0	0	0
1/4-1/2	12	0	12
1/2- 1	32	0	32
1 - 2	216	163	379
2 - 3	235	0	235
3 - 4	246	927	1173
TOTAL	741	1336	1831

[redacted]

[redacted]

There are no surface water intakes located along the 15-mile surface water pathway. In addition, there are no designated wellhead protection areas within the vicinity of the site.

3.2 Surface Water

The site is in the Georges Creek Valley, a seven mile wide, northeast trending valley between the high ridges of Big Savage Mt. to the northwest and Dans Mt. to the southeast. The valley itself is very hilly, with elevations ranging from 1300 feet to 2240 feet (the site is at 2050 feet). The ridges of Big Savage Mt. and Dans

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Mt. are at 2900 feet and 2800 feet, respectively. The site is on the eastern side of a small hill which slopes 10-15 degrees down to the east and southeast.

The former landfill is located on the crest of a divide between the northern and southern branches of Braddock Run. A pond is located 50 feet southeast of the fill area.

There are two potential routes for the entry of contaminants from the Landfill into surface water. Overland runoff from the site follows the topography and flows east, entering Braddock Run about one-half mile to the southeast. The second is the outlet of the Hoffman Drainage Tunnel, which also empties into Braddock Run about one-half mile southeast of the site. Because both overland flow and drainage from the Tunnel are in the same general area, they are considered to contribute to one probable point of entry (ppe).

Braddock Run is estimated to flow at 10 - 100 cubic feet per second (cfs). It flows east for approximately 8 miles from the ppe to the confluence with Wills Creek. The Creek flows south for 2.5 miles at approximately 324 cfs until it converges with the C&O Canal, a national historic site and sensitive environment. The C & O Canal makes up about 1.5 miles of the 15 mile surface water pathway. The Canal feeds into the North Branch of the Potomac River. The Potomac River is the last 3 miles of the 15 mile surface water pathway. At a downstream gauging station the estimated average flow rate of the Potomac is 1256 cfs.[23] There are no downstream surface water intakes within 15 miles of the site.

Portions of Braddock Run are considered to be fisheries. Most fishing occurs near La Vale, about 2.5 stream miles from the ppe, with some also perhaps near Clarysville, about 0.75 mile from the ppe.[39,41]

The southern branch of Braddock Run is not designated as a wetland.[16] East of Clarysville there are several small areas of forested palustrine wetlands before the confluence with Wills Creek. Each of these wetland areas are approximately 1/2 mile in length. There is also a small area of forested palustrine wetland within the C & O Canal. A final area of wetland exists on the north branch of the Potomac River. Each of these wetland areas also measures 1/2 mile in length. The total wetland frontages associated with this surface water pathway are summarized below:

From	To	Distance	Flow rate (cfs)	Wetland frontage
ppe (Braddock Run)	Wills Creek	8 miles	10-100	2 miles
Wills Creek	C&O Canal	2.5 miles	324[10]	0 miles
C & O Canal	North Branch of Potomac River	1.5 miles	100-1000	0.5 miles
Potomac River	15-mile point	3 miles	1256[10]	0.5 miles

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The stretch of the Potomac River below the Landfill is used for recreational fishing. Braddock Run was barren of fish for many years due to acid mine drainage, but wild, reproducing brook trout have returned to the stream.[24]

Several parks and wildlife areas are located within four miles of the site, including the Savage River State Forest, Dans Mt. State Park, and the Dans Mt. Wildlife Management Area.

3.3 Soils

The soils at the site have been disrupted by strip mining and covering of the waste on the Landfill. Prior to the strip mining operations at the site, the soil consisted of the Gilpin Series. These are mostly shallow soils that often have boulders at the surface. These soil types have water tables at a depth of greater than 4 feet, and have infiltration rates of 0.6 to 2.0 inches per hour.[18] Figure 10 is a soils map.

3.4 Geology

The Landfill is located in the Appalachian Plateau physiographic province. This plateau extends from Alabama to Pennsylvania. It is bordered on the east by the Valley and Ridge physiographic province and on the west it grades into the flat lying rocks of the stable craton. Porosity and permeability of the rocks of the Appalachian Plateau depend on the frequency, density and interconnection of fractures. In general, the most productive aquifers are in sandstone, although yield may vary throughout the formation depending on degree and type of fracturing and cementation. Except on a local level, limestone is not an important source of groundwater in this Province, because it is thinly bedded in most places and often contains shale.[19]

Outcropping at the site is from Permian age undifferentiated rocks and the Monongahela Formation (see Figure 5). The Permian age rocks are present only as a cap on a hill adjacent to the site. The Monongahela Formation consists of interbedded sandstone, siltstone, shale, and several important coal beds,[20] including the Pittsburgh Coal , which is the thickest coal bed in the northern Appalachian coal fields.[21] The formation is from 240 to 270 feet thick in this area.[20]

The Conemaugh Formation outcrops an estimated 0.5 mile east of the site. It consists of interbedded sandstone, siltstone and shale with minor limestone and coal beds. Thickness of the formation ranges from 835 to 925 feet.

The site is located on the southeast flank of the broad Georges Creek Syncline. The Syncline plunges to the southwest, with rocks striking northeast and dipping 5 degrees to the northwest.[21] No

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faults are indicated in the area of the site. No karst terrain is present within a 4 mile radius of the site, even though thin limestone beds are known to be present within the Conemaugh and Monongahela Formations. Figure 9 is a conceptual geological cross-section.

3.5 Groundwater

The Landfill is located in the Georges Creek Basin water province, which is coincident with the topographic Georges Creek Valley. The Monongahela Formation outcrops at the site. It yields groundwater to wells and springs in quantities generally sufficient for domestic and farm use. Because of its thinness and isolated topographic position in some places, it is not as good an aquifer as the underlying Conemaugh Formation. Depths of drilled wells in this formation range from 60 to 85 feet. The yield is from 2 to 20 gallons per minute (gpm). Because of mining and tunneling, the Monongahela Formation may be totally drained in some places.

Groundwater from wells and springs in the Conemaugh Formation, which underlies the site, is used for public water supply in various towns in Allegany County. In the target area, the towns of Clarysville and Vale Summit use springs for municipal water supply. Most of the wells in the Georges Creek Basin Water province are in the Conemaugh Formation. Depths of wells present in this formation ranges from 22 to 1354 feet. Yields range from 1 to 170 gpm.

At the site, groundwater exists at a depth of 5 feet. Wells within one mile average a flow of 8.5 gpm and range in depth from 50-575 feet and average 164 feet deep. It is believed that surface water runoff and shallow groundwater flows towards the east, while the deeper groundwater flows west towards George's Creek Basin.

The site is near the outlet of the Hoffman Drainage Tunnel, which may affect groundwater location or movement at the site. This Tunnel was constructed in 1906 to drain the abandoned mines in the Pittsburgh and Sewickley coals between Frostburg and Midland. Seventeen square miles of workings were connected to the tunnel by means of 13 miles of auxiliary tunnels and ditches in the floors of the mines.[5]

Ten observation wells were drilled on-site in May of 1970. The wells range in depth from 51-86 feet and were drilled to the top of the Tyson coal seam. Wells number 1-8 were drilled near the landfill pit, and wells 9 and 10 were drilled to observe groundwater levels and indicate any movement from the pit (Appendix C). During the October, 1993 site visits, none of the wells could be located.

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Springs are common in Allegany County, usually issuing from limestones and dolostones, but also coming from the Conemaugh and Monongahela Formations. Springs in the Conemaugh Formation range in discharge from 1 to 150 gpd.[20]

3.6 Meteorology

The climate of western Maryland is temperate and humid. Average annual precipitation is 40 inches, and the average lake evaporation is 32 inches. The two-year twenty-four hour rainfall is 2.7 inches.[22]

3.7 Nearby Land Use and Population Distribution

Approximately 17,684 people live within a four mile radius of the Hoffman Landfill. This population is distributed as follows:

Distance of Ring from the Site (Miles)	Estimated Population
0 - 1/4	290
1/4 - 1/2	68
1/2 - 1	1,287
1 - 2	11,209
2 - 3	3,319
3 - 4	1,511
Total Population	17,684

This population estimate is based in part on house counts from U.S. Geological Survey (USGS) topographic maps,[7] multiplied by the average number of residents per dwelling for Allegany County (2.3) and 1990 census data.[13] Since the topographic maps do not indicate all houses in urban areas, 1990 census data was used to obtain a population value for the City of Frostburg.[14] The City has about 8,075 residents which were apportioned to the distance rings based on visual estimates as follows: 1/2 - 1 mile ring = 175; 1 - 2 mile ring = 6,100, including 2,000 students at Frostburg State University; 2 -3 mile ring = 1,800. An additional 2,937 students at the University[15] not included in the census are also estimated to be located in the 1 - 2 mile ring.

Within 200' of the site, there are an estimated 120 persons in the Frostburg Heights apartments, and 170 persons in the associated nursing home. The nearest regularly occupied buildings to any source at the site are the Comfort Inn Motel and the apartment building, which may partially overlie fill areas.

There is a building under construction near the site between the bank and Rish Equipment. On October 5, 1993, a trench was being

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excavated through the Landfill to the building for the installation of a water line. Refuse from the Landfill was laying on the surface of the ground, and the equipment operator was not wearing any protective equipment.[8]

Access to the Landfill is unrestricted. Although there are six (soon to be seven) buildings within 200' of the Landfill, there are no schools, day care centers, or private residences nearby. No odors, stained soil, or leachate were observed during site sampling, although there was some ponded water on the surface of the Landfill.

Beall High School is located 0.7 mile northwest of the site, and the topographic map shows at least three other schools in central Frostburg, 1.5 miles to the northwest.[1]

About four miles east of the site there is a small area (less than two acres) designated as palustrine forested wetlands.[1,16] There is a pond located about 50' southeast of the fill area that may receive overland runoff, leachate, and/or shallow groundwater from the Landfill.

4.0 Waste Description

Both municipal and industrial wastes were disposed in the abandoned strip mine and landfill from 1967 to late 1971. When the Landfill was active, the quantity of waste accepted continually increased. In 1967, 20-60 tons per day were received; by 1971 the quantity increased to 200-275 tons per day. It is estimated that a total of 225,000 tons of refuse were placed in the Landfill.[1]

The rules of operation at the Hoffman Landfill indicated that no hazardous materials were to be accepted. However, the definition of hazardous materials was not entirely specified in these rules.[4]

The following companies are known to have disposed of waste at the Hoffman Landfill: Allegany County; Celanese Corporation (Amcelle Plant); Kelly-Springfield Tire Company; and PPG Industries, all centered in Cumberland (Appendix B). No accurate records of the industrial wastes disposed were kept. These wastes may have included asbestos, resins, solvents, rubber wastes and Carbon Black (Kelly-Springfield), chromium (Hercules), fiberglass, and activators.[10,11] All four companies filed letters with the Allegany County Engineering Department noting that each had reviewed a State list of designated hazardous substances, and that each was not depositing any listed materials, except as noted.[10]

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5.0 Site Sampling

5.1 Previous Studies

5.1.1 Early Studies

Groundwater

Groundwater samples were collected by the Maryland Water Resources Administration during the five years that the Hoffman Landfill was active. The analytical data showed no evidence of the movement of contaminants from the Landfill into the observation wells. Analysis of some samples indicated the presence of several heavy metals in the groundwater. However, this occurence may be natural since coal deposits in the area of the Hoffman Landfill contain heavy metals in abundance. Also, no boron was detected in groundwater even though a boron tracer was placed in the Landfill.[4]

Samples from three monitoring wells (MW-3,5, & 10) and one off-site well (Maplehurst Country Club) collected in 1981 (TDD no. F3-8104-24) by Ecology & Environment did not contain any organic contaminants at levels of toxicological concern.[10] A 1980 study by the same firm (TDD No. F3-8009-06) involved the collection of samples from MW-3 & 10, the "East Cow Pond," and the Hoffman Drainage Tunnel. Vinyl chloride was detected in MW-3 at 28 parts per billion (ppb). Nickel was found in the Hoffman Drainage Tunnel, MW-3, and MW-10 at levels of 86,78 and 29 ppb, respectively. The presence of nickel was attributed to strip mining.

Hoffman Drainage Tunnel

Regional sampling was conducted by the Maryland Department of Natural Resources, Maryland Geological Survey, in 1970. The purpose of this sampling was to "test the idea that there is a definitive relation between the chemical properties of mine drainage and the associated coal-measure stratigraphy."[1,5] The Hoffman Drainage Tunnel, which may drain the Hoffman Landfill, was one of the selected sampling locations. The analytical data are given in Appendix F.

Surface Water

Sampling of the on-site pond and Braddock Run was completed by the Maryland Department of Health and Mental Hygiene before the opening of the Landfill through 1971. The analytical data are given in the tables below. The data did not indicate that Braddock Run was being degraded by contaminants from the Landfill. The investigators noted that dilution of contaminants (if any) upon entry into Braddock Run might make degradation of the stream by the

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Landfill harder to detect. The data for the pond indicated that the levels of iron, chlorides, and total solids were increasing.

Analytical Data from Braddock Run[6]

Constituent or property	Sample collected 1-15-68 (mg/l except pH)	Sample collected 8-18-70 (mg/l except pH)	Range in values during period covered (mg/l except pH)	Number of analyses in range
Iron	9.0	9.0	0.0 - 12	11
Chloride	2.5	1.5	2.5 - 208	11
Nitrate	1.9	0.1	0.04 - 1.9	11
Total Solids	754	1040	684 - 1040	10
Hardness as $CaCO_3$	438	569	399 - 569	11
pH	6.1	6.8	3.7 - 6.8	11

Analytical Data from on-site pond[6]

Constituent or property	Sample collected 3-16-67 (mg/l except pH)	Sample collected 4-27-70 (mg/l except pH)	Range in values during period covered (mg/l except pH)	Number of analyses in range
Iron	0.3	100	0.2 - 2250	10
Chloride	6.0	192	0.5 - 231	9
Nitrate	0.1	3.0	0.1 - 3.0	9
Total Solids	248	3316	208 - 7058	9
Hardness as $CaCO_3$	106	---	106 - 2310	9
pH	7.1	5.3	3.7 - 7.9	9

5.1.2 Level III Site Inspection Prioritization

This study was conducted by the MDE/Hazardous and Solid Waste Management Administration (HSWMA) in 1992.[1] The analytical data are summarized in Appendix A.

Groundwater samples collected included the Clarysville Supply Spring (GW-1), a residential well (GW-2/GW-5), a local golf course well used to fill ponds (GW-3), on-site monitoring well 3 (GW-6), and a background well (GW-4). No contaminants were detected in GW-1 at levels that exceeded three times background. GW-2/GW-5 contained no contaminants at levels of toxicological concern. GW-3 had not been used in a year when it was sampled; it contained elevated levels of contaminants including arsenic, beryllium, iron, lead and manganese that were not attributed to the site. A low level of lindane was detected in GW-4, and chloroform in GW-2/GW-5.

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Contaminants detected in samples from the monitoring well included arsenic, iron, and vinyl chloride (See Tables 1C & 1D in Appendix A). A limitation of the data is that the monitoring well was determined to be subject to surface water runoff.

Aqueous and sediment surface water samples were collected from four different locations. These included Braddock Run downstream of the Hoffman Drainage Tunnel (SW/SED-1), Braddock Run east of Clarysville (SW/SED-2), the on-site pond (SW/SED-3), and a background sample (SW/SED-4). No organic contaminants were detected in the aqueous samples. SED-2 and SED-3 contained low levels of polycyclic aromatic hydrocarbons (PAHs), and low levels of 4,4'-DDE and toluene were detected in SED-4 and SED-1, respectively.

In aqueous surface water samples, elevated levels of iron were present in SW-1, SW-2, and SW-3. SW-2 contained the highest levels of iron (5,800 μg/L), manganese (3,020 μg/L), and nickel (78.7 μg/L). SED-2 contained chromium, cobalt, manganese, and selenium at greater than three times background. The level of manganese in this sample was 13,500 mg/kg. The highest level of iron was also found in SED-2 (49,700 mg/kg) [**Note:** the levels of manganese and iron found in SED-8, which was collected east of Clarysville during the present study are similarly high, and thought to be due to regional acid mine drainage].

Seven soil samples and one leachate sample were collected on-site. Low levels of PAHs and pesticides were detected in one or more soil samples. No inorganic analytes were detected at greater than three times background except for a low level of mercury in S-3/S-7 and cyanide in S-4. No inorganic analytes were present in the background sample (S-1) at levels that exceeded the ranges for typical soils in the Eastern United States.[25,29] The leachate sample did not contain any contaminants above three times background.

5.2 MDE/WAS/SAD Contract Laboratory Sampling

Before sampling the site, the MDE/WAS CERCLA Site Assessment Division (SAD) submitted a sampling plan to the USEPA Region III in October, 1993. This plan was approved by EPA on October 26, 1993, and is also being submitted to EPA with this report.

Samples were collected from the residential wells, sources, soil, and surface water on and near the site on November 3 and 4, 1993. These samples were collected and submitted for analysis as Case Number 21162 in accordance with the USEPA Contract Laboratory Program (CLP) Routine Analytical Services (RAS). The samples were analyzed for the Target Compound List (TCL), which includes analyses for organic compounds (including pesticides/PCBs) and the Target Analyte List (TAL) for inorganic substances.

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The samples were collected in four sample matrices: one organic aqueous, two organic solid, one inorganic aqueous, two inorganic solid. The Standard Operating Procedures for Field Operations contained in MDE's Quality Assurance Project Plan were followed as appropriate.

CLP protocol was adhered to throughout the sample collection and submittal process (U.S. "User's Guide to CLP," Dec. 1988). The Quality Control (QC) used by MDE includes the submittal of a field duplicate for each matrix as defined above. Note that a maximum of 20 samples are permitted per matrix.

In addition, each matrix had one sample designated as the spike sample, which was collected at specified additional volumes in order to provide the laboratories with additional sample volumes for CLP matrix spike QC procedures. Specifically, the following additional volumes, including both the spike volume and the corresponding spike duplicate volume, were collected (volumes expressed as multiples of the regular sample volume of 1):

Sample Matrix	Spike Volume
Organic Aqueous	3
Organic Solid	2
Inorganic Aqueous	2
Inorganic Solid	1

Samples were shipped daily to the appropriate inorganic and organic labs. A field blank (BLK-1) was prepared for the aqueous matrices. This blank consisted of deionized water provided by the Maryland Department of Health and Mental Hygiene (MDHMH) Laboratory. This water was transported to the field in 5-gallon containers, and then transferred in the field on the first day of sample collection to the appropriate sample containers. An aqueous volatile organics analysis (VOA) trip-blank sample (TB-2) was included with the organic shipment on the second day. The trip-blank consisted of deionized water, fixed with HCL and contained in VOA sample containers.

Sample Collection Log

Sample Number	OTR#	ITR#	Sample Location	Sample Type	Remarks
SW-1 SED-1	CJW19 CJW06	MCJX19 MCJX06	Pond near Landfill	aqueous sediment	
SW-2 SED-2	CJW20 CJW07	MCJX20 MCJX07	Southern Branch of Braddock Run, south of confluence with Hoffman Drainage Tunnel outlet	aqueous sediment	Background sample for SW/SED-3,4,5,7,8
SW-3 SED-3	CJW21 CJW08	MCJX21 MCJX08	Outlet for the Hoffman Drainage Tunnel into western branch of Braddock Run	aqueous sediment	Water level low

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SW-4 SED-4	CJW22 CJW09RE	MCJX22 MCJX09	Confluence of the southern branch of Braddock Run and the streamflow from the Tunnel	aqueous sediment	
SW-5 SED-5	CJW23 CJW10	MCJX23 MCJX10	Sampling point on southern Braddock Run between above confluence and SW/SED-7	aqueous sediment	Sediment stained deep orange
SW-6 SED-6	CJW24 CJW11	MCJX24 MCJX11	Unnamed stream that flows from north to south into Braddock Run	aqueous sediment	Background sample for SW/SED-7,8
SW-7 SED-7	CJW25 CJW12	MCJX25 MCJX12	Confluence of above stream and eastern branch of Braddock Run	aqueous sediment	Sediment stained deep orange in Braddock Run
SW-8 SED-8	CJW26 CJW13	MCJX26 MCJX13	East of SW/SED-7 on Braddock Run	aqueous sediment	Sediment stained deep orange in Braddock Run
RW-1	CJW15	MCJX15	[redacted]	aqueous	Purge time about 10 minutes
RW-2	CJW16	MCJX16	[redacted]	aqueous	Purge time about 10 minutes
RW-4	CJW18	MCJX18	[redacted]	aqueous	Background sample; purge time about 10 minutes
BLK-1	CJW28	MCJX28	N/A	aqueous	field blank
TB-2	CJW29	N/A	N/A	aqueous	trip blank for VOCs

Sample Number	OTR#	ITR#	Sample Location	Remarks*
Source-1	CJW01	MCJX01	Northcentral Landfill	Collected at 21"
Source-2	CJW2RE	MCJX02	Central Landfill	Collected at 19"
Source-3	CJW03	MCJX03	Southcentral Landfill	Collected at 4'4"
Source-4	CJW04	MCJX04	Southern Landfill	Collected at 3'4"
Source-5	CJW05	MCJX05	Opposite (west) side of Route 36 from the LF	Background, collected at 2'5"
Source-6	CKW92	MCJX92	Landfill debris uncovered from installation of water line for new building	Surficial sample

*Cold weather (35° F) with snow on ground

The samples were packaged on-site and transported to Federal Express on each day of collection for shipment to the following laboratories:

<u>Organic Matrices</u>
Coast to Coast Analytical Services, Inc.
340 Country Road, #5
Westbrook, Maine 04092
(207) 874-2400
Attn: Willard Warren

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Inorganic Matrices
ETS Analytical Services
1401 Municipal Road, N.W.
Roanoke, Virginia 24012
(703) 265-0004
Attn: Sue Deegan

The following fixatives were used during this study: HCl (Lot # 4593-10, Manuf.9/93); HNO_3 (Lot # 1593-6, Manuf. 8/93,); NaOH (Lot # 940508, Manuf. 8/93,). There are no expiration dates.
The field blank BLK-1 contained in μg/L: chloroform (1J); 1,2-dichloroethane (2J); 1,1,2,2-tetrachloroethane (2J); toluene (1J); chlorobenzene (1J); xylenes (total) (2J); butylbenzylphthalate (1J); diethylphthalate (1J). The trip blank, TB-2 did not contain any volatile oraganic compounds (VOCs) above laboratory detection limits. Chloroform, xylenes, and butylbenzyphthalate were likewise present in site-related aqueous or solid samples.

The following inorganic substances were detected in BLK-1 (units in ug/L): Ca ([139]), Cr ([9.6]K), and Fe ([15.8]). These substances were likewise present in some of the site-related aqueous and/or solid samples.

The "J" data qualifier means that the analyte is present, but that the reported value may not be accurate or precise. The "[]" qualifer means that the analyte is present but as values approach the instrument detection limit the quantitation may not be accurate.

A discussion of the quality control laboratory blanks is included in Attachments I and II, which also include the organic and inorganic validated data summary tables, respectively. Also, each contaminant in the data tables that exceeded 3X the background sample is highlighted.

5.2.1 Groundwater Sampling Results

Groundwater samples were collected from two target wells (RW-1 & RW-2) and one background well (RW-4) (Figure 6). In RW-4, analysis of the sample indicated the presence of contaminants at the following levels (μg/L): barium (255), calcium (45,800), manganese (92.4), potassium ([1640]), and zinc (1,030). These contaminants were present at levels greater than those in RW-1 & RW-2. The inorganic substances on EPA's Target Analyte List (TAL) that exceeded three times the background concentration are copper in RW-1 ([7.7]K) μg/L and RW-2 (35.2K), and sodium in RW-1 (48,100 μg/L). The levels of barium do not exceed the EPA Maximum Contaminant Level (MCL), and copper is not present above the EPA Action Level.[27] The Secondary Maximum Contaminant Levels (SMCLs) for odor and taste for iron (300 parts per billion or ppb) and manganese (50 ppb) were exceeded in all three samples. However, EPA's risk-based

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concentration of 180 ppb for manganese in tap water is not exceeded.[28] No risk-based concentration is set for copper.

The sole organic compound detected in groundwater is 35 μg/L of chloroform in RW-1. The MCL for chloroform is 100 μg/L, and the risk-based concentration for carcinogenic effects is 0.15 μg/L (see Section 6.0). Chloroform can be associated with the chlorination of drinking water.

5.2.2 Surface Water Sampling Results

The sampling locations are shown in Figure 7.

Organic Analytical Data

No organic contaminants were detected in any of the aqueous or sediment samples at levels of toxicological concern. The only contaminant detected in an aqueous sample is 0.11 μg/L of 4,4'-DDT in SW-6, a background sample.

In SED-1, collected from the pond near the Landfill, 33J μg/kg of di-n-octylphthalate and 30J μg/kg of benzo(b)fluoranthene were detected. However, SED-6, a background stream sample, also contained benzo(b)fluoranthene (47J μg/kg).

Twelve (12) semi-volatile organic compounds (SVOCs) were detected in one or more sediment samples. Eight (8) SVOCs were detected in SED-4 and in the duplicate SED-9 at low levels (< 240J μg/kg) that equaled or exceeded the downstream samples SED-5, SED-7, and SED-8. SED-4 was collected at the confluence of the western branch of Braddock Run, which receives discharge from the Hoffman Drainage Tunnel, and the southern branch of Braddock Run. Seven (7) SVOCs are present in SED-4 at levels that equal or exceed three times the background sample, SED-2. SED-3, which was collected at the outlet of the Hoffman Drainage Tunnel (upstream of SED-4) generally contained SVOCs at levels similar to those in SED-4.

The pesticide Aldrin was detected (in μg/kg) in SED-4/SED-9 (3.5J/5.2J) and SED-3 (3.5J). These two samples were collected from an area of Braddock Run that is not a documented fishery. Aldrin was widely used in the 1960's for broad spectrum insect control (including as a soil insecticide) in Maryland.[40,42]

Inorganic Analytical Data

In aqueous samples, cobalt, iron, manganese and nickel were detected in one or more samples at levels equal to or greater than three times the background sample(s). The following levels were detected in μg/L: **iron** (SW-3/SW-9, 385/847; SW-5,11000; SW-8, 10400); **cobalt** (SW-5, 52.9; SW-8,53.0); **manganese** (SW-5,5010; SW-7,298; SW-8; 4770); and **nickel** (SW-5, 101; SW-8, 88.2).

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In samples SED-1, SED-3, and SED-4/SED-9, no inorganic analytes were detected at levels that equaled or exceeded three times the background sample, SED-2. Manganese exceeded three times the background sample in SED-5 (6090 mg/kg) and SED-8 (27900 mg/kg). It was elevated in SED-7 at 3720 mg/kg. Also detected in SED-8 were 335 mg/kg of cobalt, and 710 mg/kg of nickel. High levels of iron were detected in **all** samples at concentrations ranging from 26600 in SED-3 to 98600 in SED-8.

Special Analytical Services (SAS) Results for Boron

When the Landfill was active, a boron tracer was placed in it in an effort to monitor the migration of contaminants away from the site. As part of this study, analysis of aqueous and sediment surface water samples for boron was performed. The analytical data are given in the following table and in Attachment III.

Sample Designation	EPA Sample Number	Concentration (Mg/Kg)
SW-1	SC3805	11.8
SW-2*	SC3806	15.7
SW-3	SC3807	13.3
SW-4	SC3808	12.9
SW-6*	SC3809	21.9
SW-7	SC3810	21.7
SW-8	SC3811	26.2
SED-1	SC3801	24.7
SED-2*	SC3802	31.8
SED-3	SC3803	14.8
SED-4	SC3804	17.8
SB-1**	SC3812	5.0 U (non-detect)

* background samples; ** field blank

The above analytical data for boron indicate that there is an insignificant difference in the levels present in site-related and background samples.

Relationship between Acid Mine Drainage and Surface Waters

The Hoffman Landfill site is surrounded by areas of extensive strip mining for coal. The process of unearthing coal exposes pyrite ores containing FeS_2. When these ores are crushed during mining, the surface area available for chemical reactions increases. Upon contact with groundwater or surface water runoff, pyrite reacts with oxygen and water to form products that include $FeSO_4$ and H_2SO_4. Locally such solutions may attain pH's near zero. Acidities of this magnitude are quickly reduced by reaction with adjacent rocks.

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As a result of these processes, the levels of dissolved solids usually increase; excessive concentrations of iron, manganese, sulfate, and aluminum are common characteristics of coal-mine waters.[30,31] Other substances that can be released include Cu, Zn, Ni, As, and Se.[32]

When acid mine drainage contacts alkaline surface waters via seepage or runoff, heavy metals including iron and manganese can precipitate in the oxidized state. The flow rate and turbulence of Braddock Run are sufficiently high so that ample oxygen is available, and the pH of the stream ranges from 6.9 - 7.9, ensuring adequate alkalinity.[33] Manganese is often present to the extent of more than 1 mg/L in streams that have received acid drainage from coal mines.[34]

The following tables summarize the concentrations of iron, manganese, nickel and cobalt collected from Braddock Run downstream of the Landfill and the outlet for the Hoffman Drainage Tunnel. The levels of manganese in aqueous and sediment samples are very typical for acid mine drainage.[32] The highest concentrations of iron, manganese, and cobalt were detected in SW/SED-8, the most distant downstream sample from the site.

Analyte (µg/L)	SW-2*	SW-3/9	SW-4	SW-5	SW-6**	SW-7	SW-8
Iron	[88.8]	**385/847**	255	**11000**	285	844	**10400**
Manganese	48.2	35.1/64.8	90.8	**5010**	[14.8]	298	**4770**
Nickel	--	--/--	--	**101**	--	--	**88.2**
Cobalt	--	--/--	--	**52.9**	--	--	**53.0**

Analyte (mg/kg)	SED-2*	SED-3	SED-4/9	SED-5	SED-6**	SED-7	SED-8
Iron	85300	26600	32900/36000	93700	72200	88900	98600
Manganese	1810	847	958/724	**6090**	870	3720	**27900**
Nickel	83.1	35.7	69.6/59.3	111	37.5	106	**710**
Cobalt	49.5	20.7	37.2/29.5	90.7	20.4K	52.1	**335**

*background for all target samples; **background for SW-7 & SW-8; -- not detected above laboratory limits; bold type, greater than or equal to 3X background

SW/SED-1, collected from the on-site pond, did not contain any inorganic analytes at greater than three times background.

Based on the types and quantities of waste thought to have been disposed at the Landfill, the elevated levels of these metals are attributed to regional mining activities rather than to the site.

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5.2.3 Soil/Source Sampling Results

The sampling locations are shown in Figure 8. Nearly all organic contaminants were detected in Source-3, which was the deepest sample collected. Four volatile organic compounds (VOCs) and 11 semi-volatile organic compounds (SVOCs) were detected in this sample at relatively low levels ranging from 5J - 240J μg/kg. Contaminants included N-nitrosodiphenylamine (32J μg/kg) and benzo(a)pyrene (38J μg/kg). In Source-1, Source-2, and Source-4, low levels of phenanthrene were found. Pesticides detected in Source-3 are aldrin (3.4J), heptachlor epoxide (2.2J), and dieldrin (14J); aldrin was also found in Source-1 (4.3J), Source-2 (2.2J), and Source-4 (3.0J). Source-4 also contained 63J μg/kg of Arochlor-1242. No organic contaminants were present in the background sample Source-5 above the laboratory detection limits.

Beryllium was detected in Source-6 at 1.4 mg/kg, which exceeds three times the background level. Five more inorganic analytes, cadmium, manganese, nickel, vanadium, and zinc were also detected in all site samples at levels exceeding three times background. This is perhaps due to the fact that the background sample, located on the opposite side of Route 36 from the site, was not collected from an area of former strip mining The maximum concentrations detected are (in mg/kg): cadmium, 3.7; manganese, 1220; nickel, 30.5; vanadium, 29.2; and zinc, 134. Only cadmium exceeds the ranges for typical U.S. soils.[25,29]

6.0 Toxicological Evaluation

The Hoffman landfill site is a former coal strip mine, part of which was converted to a sanitary landfill in 1967. It is located on the southeast edge of the city of Frostburg in Allegany County Maryland, and covers 22 acres adjacent to the Frostburg Industrial Park. The site encompasses, but is not limited to, the landfill. Six buildings within 200 feet of the site include an apartment building (30 feet from the site), a nursing home, a bank and a motel. A seventh building was under construction in October, 1993. The water line for this seventh building lies in the fill area. The apartment building and motel may partially overlie the site. Beall High School is located 0.7 miles from the site.

Samples for evaluation were taken from sediment, surface water, soil and three off-site residential wells: two target wells and one well that serves as background for this landfill and the Cabin Run landfill to the southwest. The two target wells are located approximately one-quarter to one-half mile east of the site. The background well is located one mile southeast of the site. Surface water and sediment samples were taken from Braddock Run and a pond on-site. Braddock Run flows one-half mile east of the site and joins Wills Creek just north of Cumberland, and then flows south to the Potomac River. No readily accessible on-site monitoring wells

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were found. Although 13 monitoring wells were installed in 1971 to monitor groundwater quality none could be located during this study. Over the course of many years, all 13 wells may have been buried or paved over as a result of construction activities on the site and so may no longer be accessible.

Few organic contaminants were detected in any of the media and none were found above EPA benchmark concentrations.[28,36] Of the inorganic compounds detected, beryllium, manganese and lead were present in sediment and soil at levels exceeding EPA benchmark concentrations for both media. There were no inorganic contaminants exceeding the benchmarks in the residential well water or in the surface water samples, although an ambient water quality criterion could not be found for manganese.

Exposure pathways of concern at this site include incidental ingestion of and dermal contact with soil and sediment, and ingestion of residential well water. Since no contaminants were found at remarkable levels in residential water or surface water, the only media of concern in this evaluation are soil and sediment.

Worst case scenarios were used in the following quantitative evaluations. While these exposures are unlikely, they were used in order to protect potentially exposed populations. The following assumptions were used to assess risk associated with noncarcinogenic substance exposure (childhood and adult risks were determined separately from each other).

1. For soil and sediment, the residential scenario assumes a 70 kg adult who ingests 100 mg of soil per day; and a 15 kg child who ingests 200 mg of soil per day. The trespasser scenario assumes an average 50 kg adolescent between six and eighteen years old, who ingests 200 mg of soil per day, 7 days/week, 40 weeks per year for 6 years.

2. No residential water exposure scenario was needed for this evaluation.

To assess risk associated with carcinogenic substance exposure, childhood and adult exposures were considered together to determine excess lifetime cancer risk. The cancer assessment assumed a 70 kg adult who ingests 100 mg of soil per day, 365 days per year for 24 years out of a 70 year lifetime, and a 15 kg child who ingests 200 mg of soil per day, 365 days per year for 6 years out of a 70 year lifetime. The two exposure doses (with a combined exposure duration of 30 years) were added and then multiplied by the oral potency slope for the carcinogen to determine excess lifetime cancer risk. No human carcinogens were detected in residential water samples.

SUPPORT DATA

Organics:

None were detected above EPA benchmark concentrations.

Inorganics:

Beryllium

All sediment and soil samples contained beryllium at concentrations in excess of the benchmark for beryllium as a carcinogen (2.7 mg/kg and 1.4 mg/kg, respectively). No residential water samples contained beryllium.

Beryllium is classified by the USEPA as a B2 carcinogen (a probable human carcinogen). It has an oral potency factor of 4.3 $(mg/kg/day)^{-1}$.[36] Assuming a worst-case residential scenario for incidental ingestion of on-site sediment, the chronic daily intake would be 4.4E-06 mg/kg-day, less than the EPA RfD of 5E-03 mg/kg-day.[36] This dose would result in a carcinogenic risk of 1.9E-05 which is within the EPA acceptable risk range (1.0E-06 to 1.0E-04).

Carcinogenic risk associated with exposure to beryllium in soil is also acceptable as the maximum concentration in soil is less than in exposed sediment. Beryllium is not readily absorbed through the skin, and incidental dermal contact is not likely to cause irritation.[37]

Assessment of *noncarcinogenic risk* associated with exposure to beryllium in sediment, using the same maximum concentrations as above, results in an intake dose of 3.6E-05 mg/kg-day for a child six years old or younger, less than the EPA RfD of 5.0E-03 mg/kg-day. An adult would ingest 5.0E-07 mg/kg-day, also less than the reference dose.

Lead

Lead was found in both sediment and soil samples (62.4 mg/kg and 26.8 mg/kg, respectively). The EPA recommends that lead abatement efforts be started when lead concentrations exceed 500-1000 mg/kg in soil. Using this criterion, no samples had elevated levels. It's important to note, however, that the EPA has also determined that setting an absolute MCL or a reference dose for lead is not feasible because no threshold dose for lead has been established that does not pose a risk of adverse neurological effects; EPA has withdrawn the original RfD for lead. **Although the lead levels detected at the Hoffman site are below those required for action, they do exceed the EPA threshold reference dose of zero; ingesting the sediment and soil could pose a risk of neurotoxicity.** It is important to note that the lead levels detected fall within the

observed range (<10-300 mg/kg) for soils of the Eastern United States.

Manganese

Manganese was detected in elevated concentrations in soil and sediment samples, but not in well water samples. Manganese is not known to be a human carcinogen. Oral manganese toxicity, in general, is not common; however, high level chronic ingestion or respiratory exposure can result in irreversible toxic effects on the central nervous system (CNS). The syndrome, known as manganism, resembles Parkinson's disease and has been observed in workers employed in mining, ore-processing and ferromanganese plants. Manganese is not readily absorbed through the skin, and incidental dermal contact is not likely to cause irritation.[38] Based on CNS toxic effects data, EPA developed a RfD of 5E-03 mg/kg-day.[36]

The maximum concentration of manganese (27,900 mg/kg) was detected in Braddock Run. The persons most likely to be exposed to sediment at this location would be trespassers. Assuming that a trespasser ingests manganese in the manner outlined above, the lifetime average daily intake for a teen 0.0073 mg/kg/day. Applying the reference dose of 5E-3 mg/kg/day, the hazard quotient would be 1.46. EPA has determined that a hazard index (the sum of all the hazard quotients) of greater than 1 may result in the occurrence of adverse non-carcinogenic health effects. As stated in earlier in this report, it is believed that Braddock Run receives acid mine drainage. This drainage would result in the release of excess concentrations of heavy metals, including manganese.

Soil manganese concentrations are less than in sediment and would result in no exposure greater than the RfD trespassers.

The table below determines the hazard index for substances found in sediment. A table for soil was not constructed since all exposures were within acceptable limits.

Hazard Index for Substances in Sediment

Substance	Maximum Concentration	Intake Dose		EPA Reference Dose (RfD)	Hazard Quotient	
		child	adult		child	adult
Beryllium	2.7 mg/kg (sediment)	3.6E-05 mg/kg-d	5.3E-07 mg/kg-d	5.0E-03 mg/kg-d	0.0072	0.0001
Manganese	27,900 mg/kg (sediment)	7.3E-3 mg/kg-d	-------	5.0E-03 mg/kg-d	1.46	
Hazard Index					1.4672	0.0001

7.0 Project Personnel

Project Manager: Ginny Sells
Project Geologists: Bob Rothman and Patti Davis
MDE CLP Officer: Michele Mosco-Lascuola
Site Safety Officer: Chris Pajak
Toxicologist: Patti Culross, M.D.

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Vasile Rusu
Tom White

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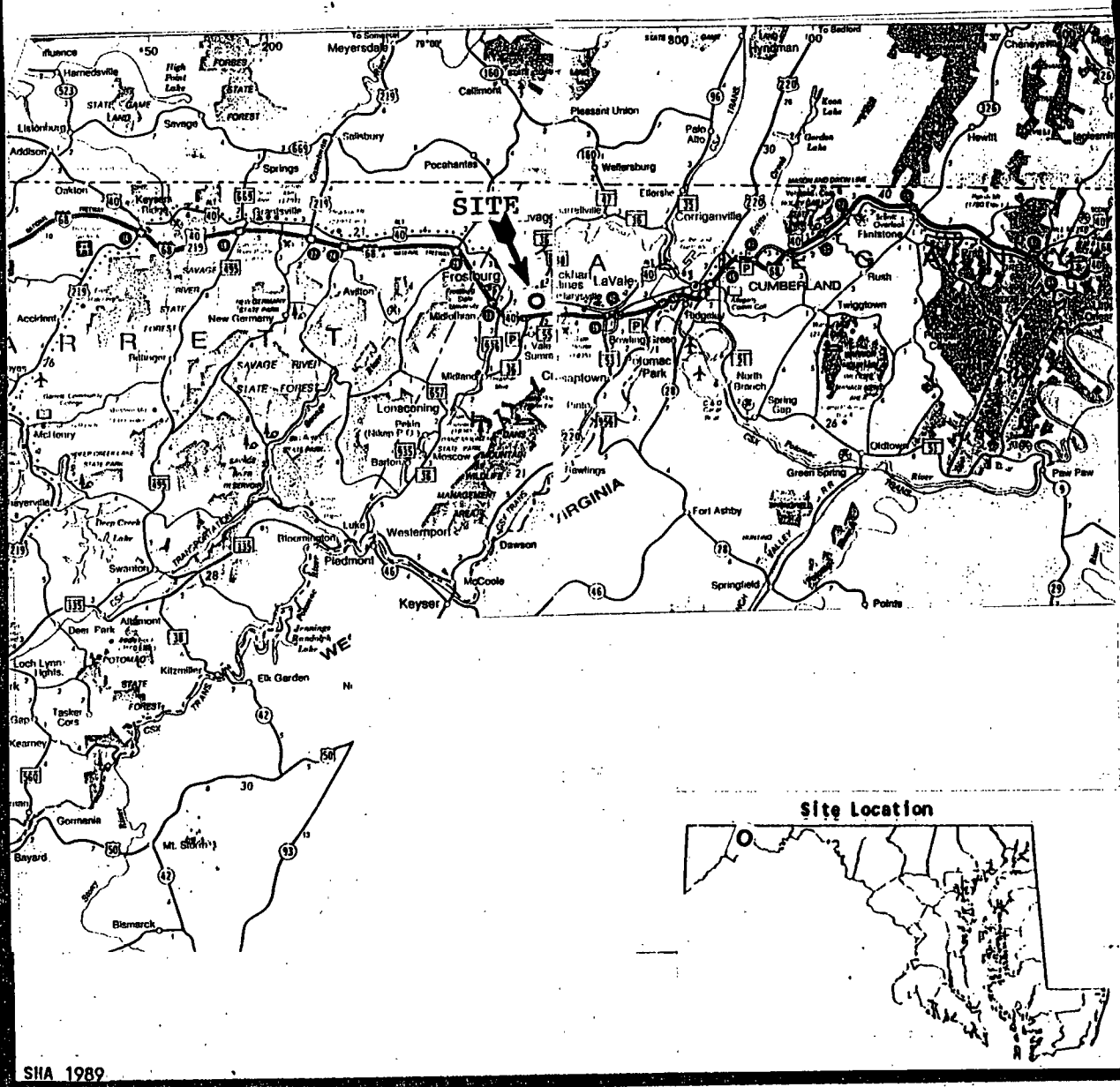
9.0 FIGURES

ORIGINAL (Red)

Regional Highway Map

Figure 1



SHA 1989

N

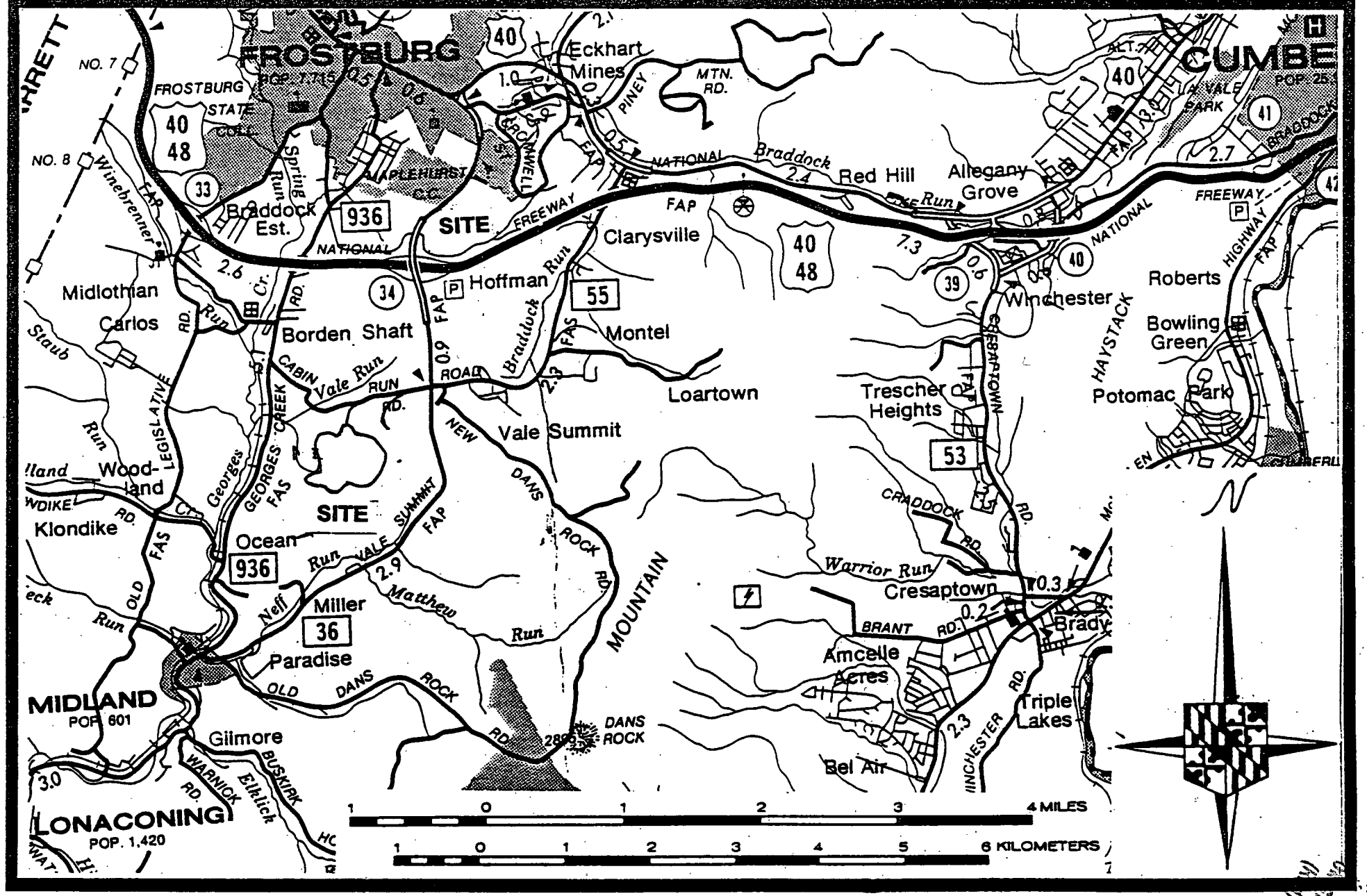
SCALE

0 6 12 MILES

0 10 20 KILOMETERS

LOCAL STREET MAP

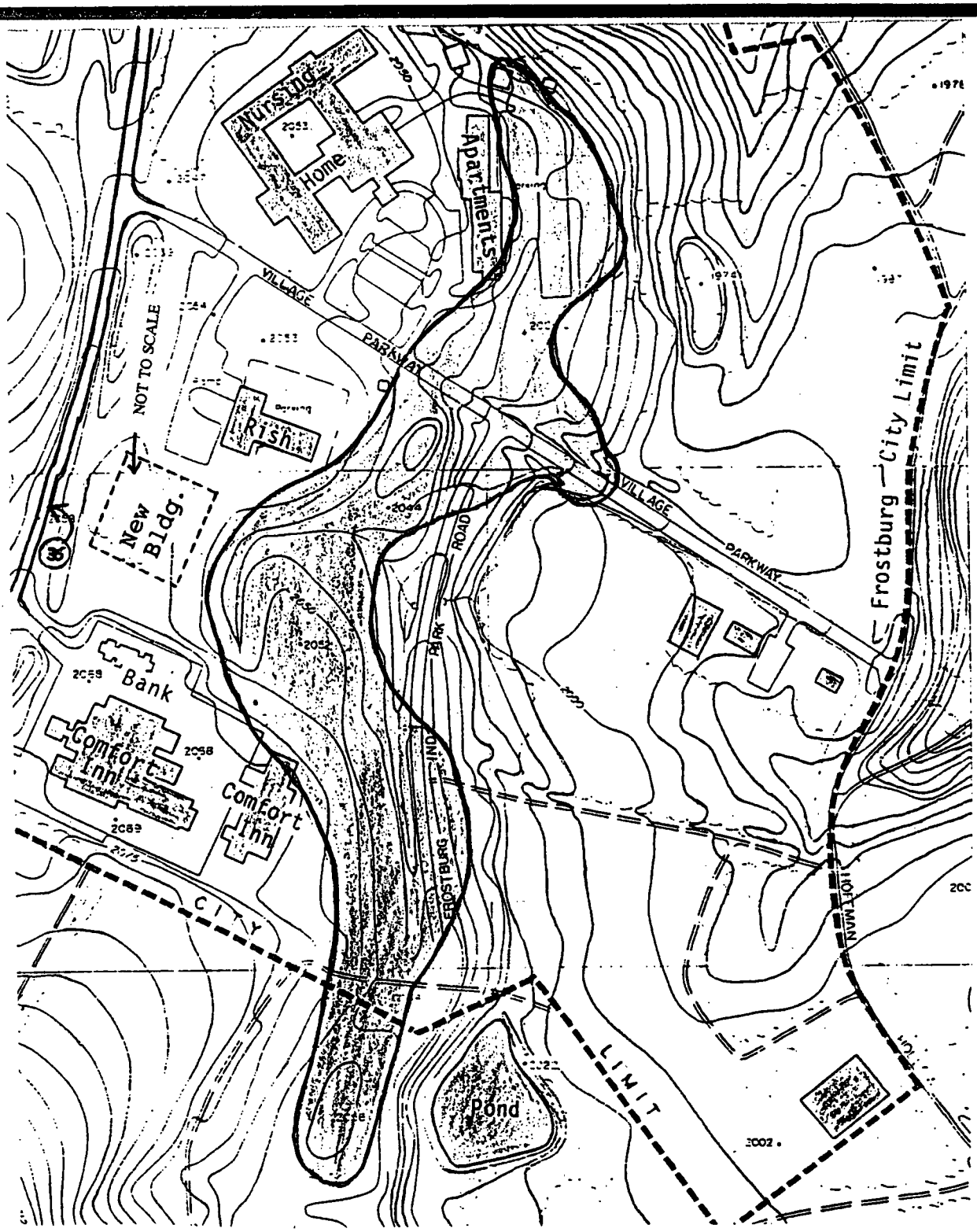
FIGURE 2



SITE SKETCH

FIGURE 3

ORIGINAL (Red)



0' 500' 1000'

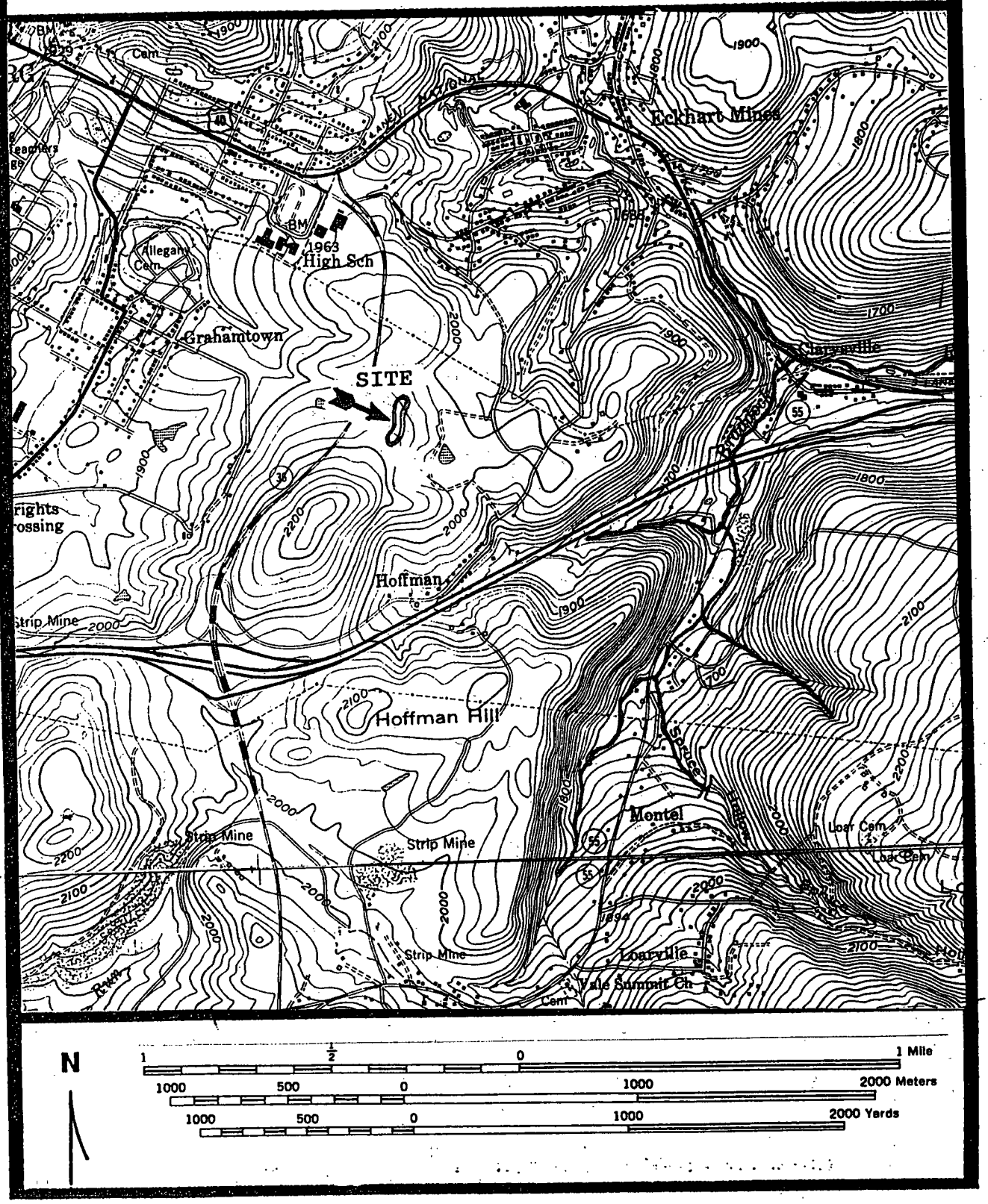
Scale

North

ORIGINAL (Red)

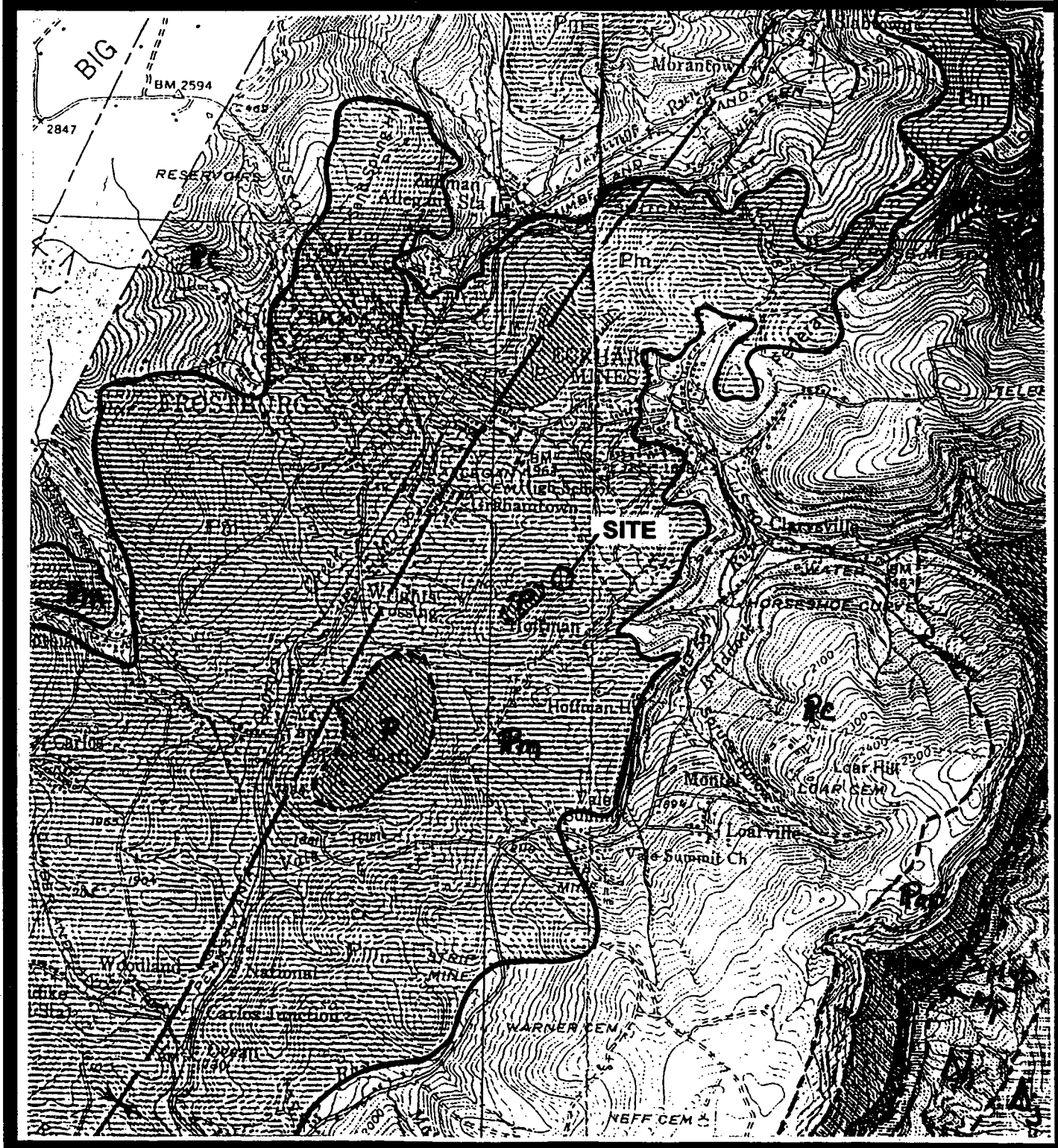
Local Topography

Figure 4



GEOLOGIC MAP

FIGURE 5



P - Permian Undifferentiated
Pm - Monongahela Formation
Pc - Conemaugh Formation
Pap - Alleghany and Pottsville Formations Undifferentiated
Mmc - Mauch Chunk Shale
Mgb - Greenbriar Formation
Mp - Pocono Formation
Dh - Hampshire Formation
Dj - Jennings Formation

N

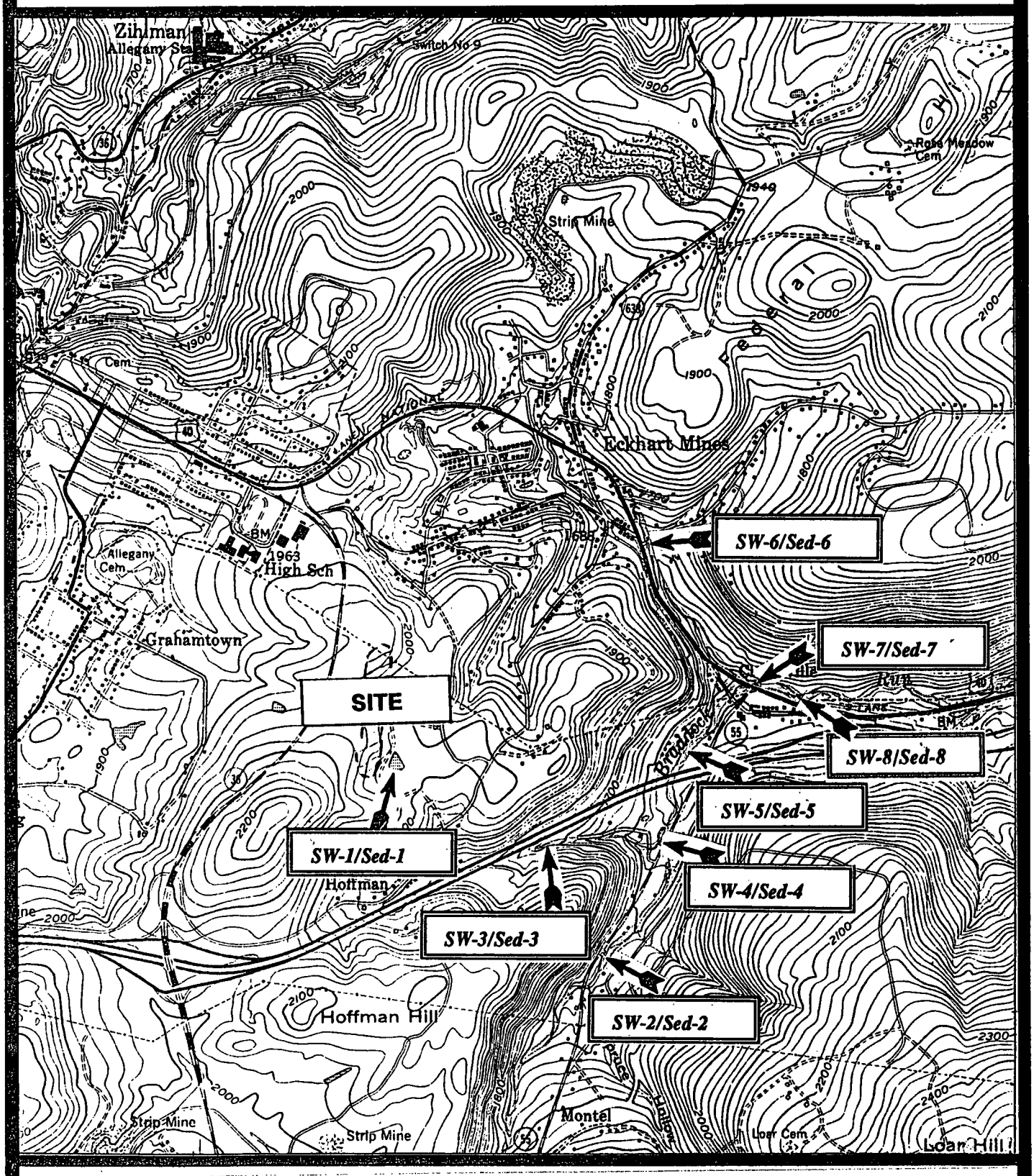
State of Maryland Department of Geology, Mines, and Water Resources. Geologic Map of Alleghany County. 1956.

GROUNDWATER SAMPLING LOCATIONS

FIGURE 6

SURFACE WATER SAMPLING LOCATIONS

FIGURE 7



NORTH

SCALE 1:24 000

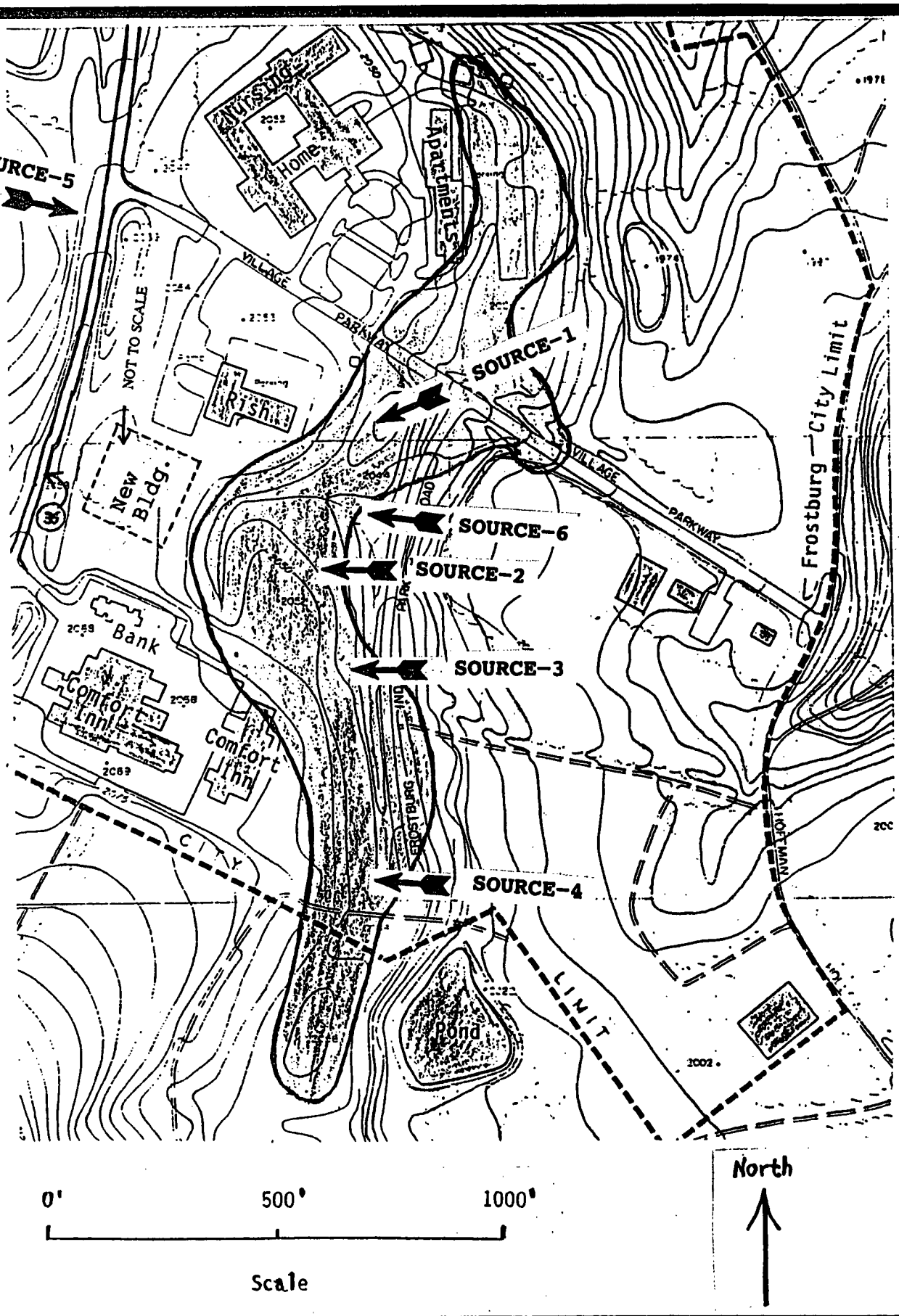
1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

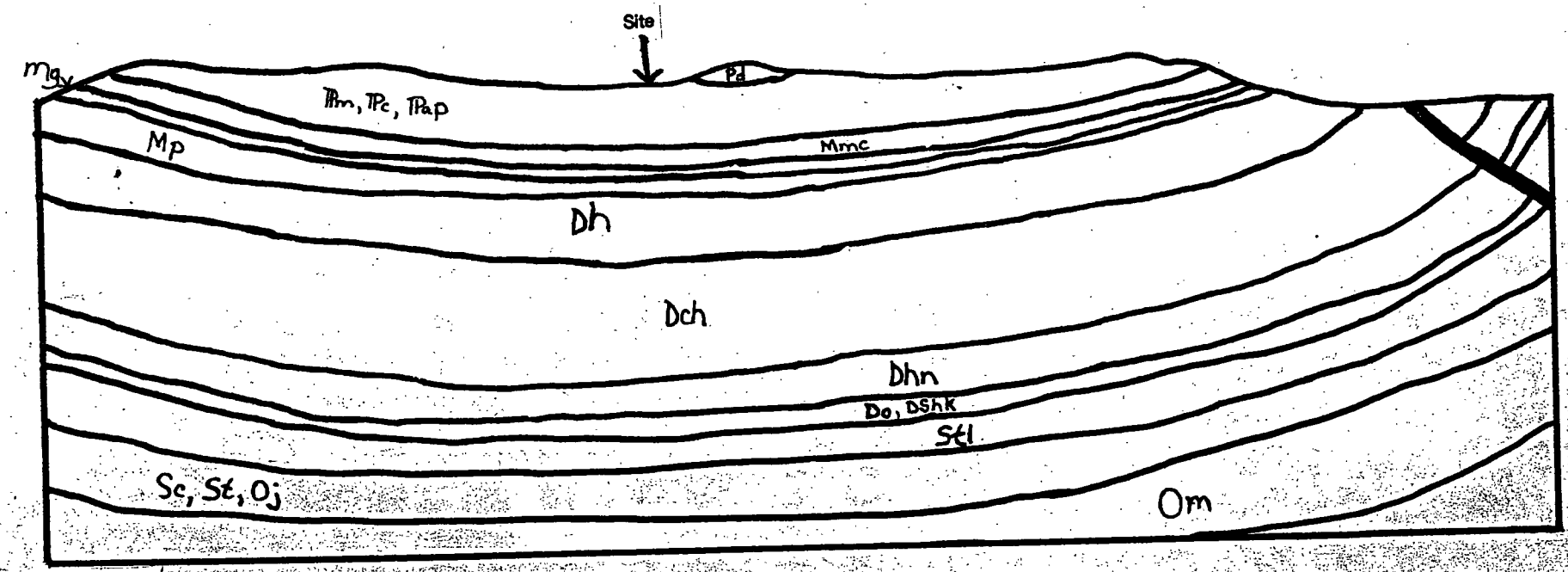
SOIL/SOURCE SAMPLING LOCATIONS

FIGURE 8



GENERALIZED REGIONAL CROSS-SECTION

FIGURE 9



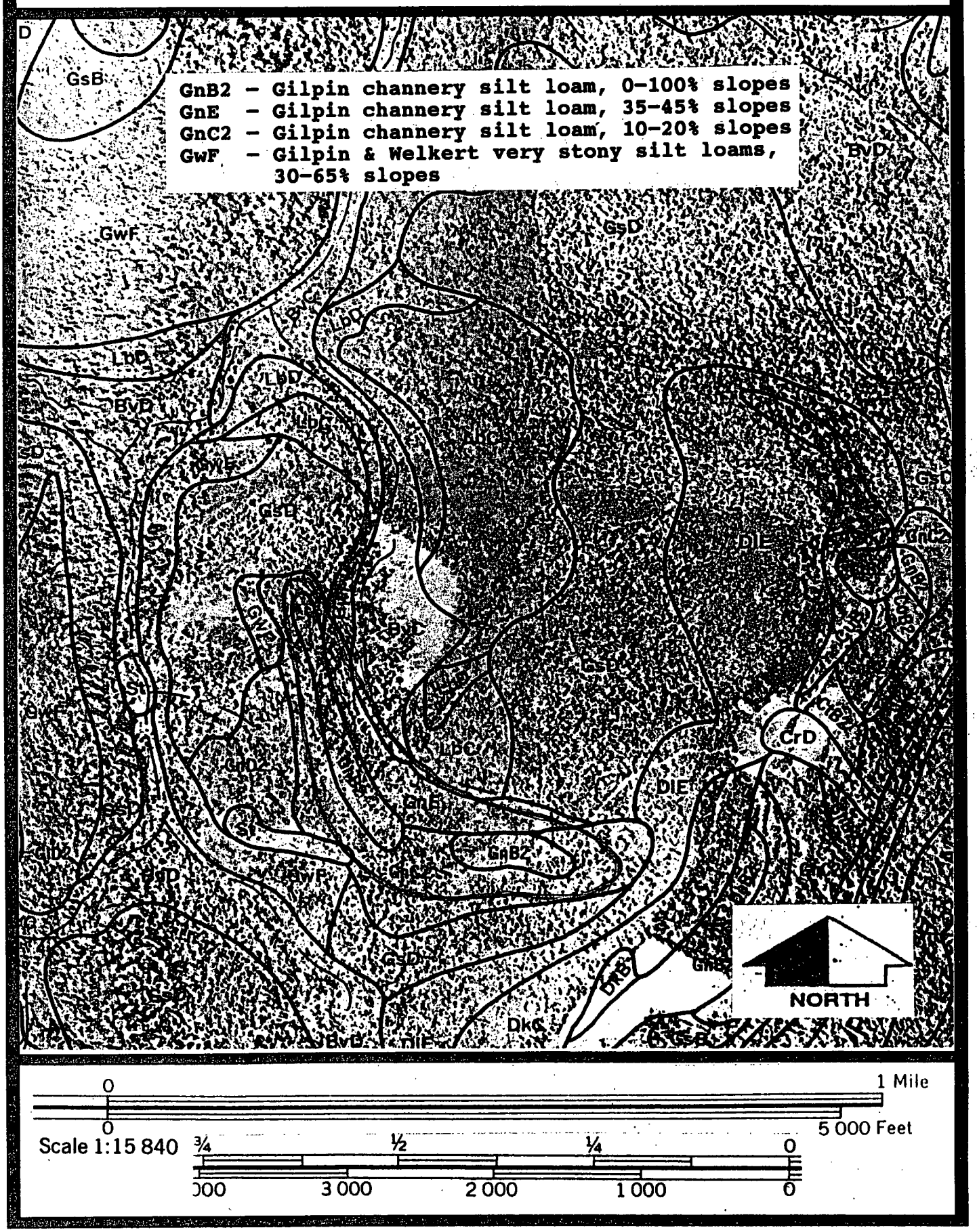
Not to scale

- Pd - Dunkard Group
- Pm, Pc, Pap - Monongahela, Conemaugh, Allegheny, Pottsville Formations
- Mmc - Mauch Chunk Formation
- Mg - Greenbriar Formation
- Mp - Pocono Group
- Dh - Hampshire Formation
- Dch - Chemeung, Parkhead, Brallier, Harrell Formations
- Dhn - Hamilton Group
- Do, DShk - Ridgeley, Shriver, Helderburg, Keyser Formations
- Stl - Tonoloway Limestone
- Sc, St, Oj - Clinton Group, Tuscarora, Juniata Formations
- Om - Martinsburg Formation

From: Geologic Map of Maryland. MD Geological Survey. 1968.

(Red) Original

FIGURE 10 SOILS MAP



ORIGINAL (Red)

10.0 APPENDICES

ORIGINAL (Red)

APPENDIX A

ORIGINAL (Red)

Sample Log - Level III SIP

Sample Designation	QTR#	ITR#	Sample Location	Type	Remarks
GW-1	CKY-15	MCJY-08	[redacted]	Aqueous	
GW-2	CKY-16	MCJY-09	[redacted]	Aqueous	
GW-3	CKY-17	MCJY-10	[redacted]	Aqueous	
GW-4	CKY-18	MCJY-11	[redacted]	Aqueous	Spike
GW-5	CKY-19	MCJY-12	[redacted]	Aqueous	Duplicate
GW-6	CKY-20	MCJY-13	On-Site Monitoring Well - Adjacent to the Comfort Inn	Aqueous	
SW-1	CKY-22	MCJY-15	Down stream from confluence of Hoffman drainage.	Aqueous	
SW-2	CKY-23	MCJY-16	Down stream from confluence of Hoffman drainage.	Aqueous	
SW-3	CKY-24	MCJY-17	On site.	Aqueous	
SW-4	CKY-25	MCJY-18	South of Braddock Run.	Aqueous	Background
LT-1	CKY-26	MCJY-19	On-site southeast of Comfort Inn.	Soil	Wetland area
SED-1	CKY-28	MCJY-21	Downstream from confluence of Hoffman drainage.	Sediment	
SED-2	CKY-29	MCJY-22	Downstream from confluence of Hoffman drainage.	Sediment	
SED-3	CKY-30	MCJY-23	On-site	Sediment	
SED-4	CKY-31	MCJY-24	South of Braddock Run.	Sediment	Background
S-1	CKY-32	MCJY-25	North west of the site.	Soil	Background
S-2	CKY-33	MCJY-26	20 feet southeast of concrete slab.	Soil	Background
S-3	CKY-34	MCJY-27	Approx. 150 feet east of Comfort Inn banquet room.	Soil	Partially decomposed waste within top 2 inches.
S-4	CKY-35	MCJY-28	25 feet from Route 36.	Soil	Clay soil - ditch with wildflowers and grass.
S-5	CKY-36	MCJY-29	22 feet east of apartments.	Soil	2 inch sample - low area
S-6	CKY-37	MCJY-30	200 feet south west of Comfort Inn.	Soil	
S-7	CKY-38	MCJY-31	Duplicate of S-3.	Soil	Duplicate of S-3

ORIGINAL (Red)

Table 1A: Inorganic Results from Groundwater Samples. Concentrations are recorded as μg/L.

Analyte	GW-4 (background)	GW-1	GW-2/GW-5	GW-3
Aluminum	[112]	--	*/*	*
Arsenic	--	--	--/--	[7.0]
Barium	[28.7]	*	[137]/[133]	206
Beryllium	--	--	—	[2.7]
Calcium	139000	*	*/*	*
Chromium	[2.2]	--	--	*
Cobalt	--	--	--/--	[13.2]
Copper	50	--	*/*	271
Iron	1530	*	*/*	172000
Lead	7.5	--	*/*	35.3
Magnesium	22100	*	*/*	*
Manganese	31.6	*	*/*	577
Nickel	--	--	--	[13.4]
Potassium	[1440]	*	*/*	*
Sodium	[1640]	*	*/*	13100
Zinc	25.4	*	*/*	561

Legend

*	Detected, but not greater than three times background
--	not detected
[ ]	As value approaches the IDL the quantitation may not be accurate

Table 1B: Organic results from groundwater samples. Concentrations are recorded as μg/L.

Compound	GW-4 (background)	GW-1	GW-2/GW-5	GW-3
chloroform			4 J/4 J	
lindane	.0039 J			

Legend

blank space	not detected
J	estimated value

ORIGINAL (Red)

Table 1C: Results from the onsite monitoring well sample. The unfiltered sample is listed as 'GW-6,' the filtered sample as Dissolved Metals GW-6. In addition, a duplicate sample of the filtered sample was collected and the results are recorded under 'DUP.' All concentrations are recorded as μg/L.

Analyte	GW-4 (background)	GW-6	Dissolved Metals GW-6/DUP
Aluminum	[112]	*	--/*
Arsenic	--	[1.4]	--/--
Barium	[28.7]	238	222/222
Beryllium	--	--	--/--
Cadmium	--	--	--/--
Calcium	139000	*	*/*
Chromium	[2.2]	--	--/--
Cobalt	--	[1.9]	--/[3.2]
Copper	50	*	--/--
Iron	1530	9300	8170J/8150J
Lead	7.5	*	--/--
Magnesium	22100	*	*/*
Manganese	31.6	490	484J/476J
Mercury	--	--	--/--
Nickel	--	--	--/--
Potassium	[1440]	*	*/*
Selenium	--	--	--/--
Sodium	[1640]	*	*/*
Vanadium	--	--	--/--
Zinc	25.4	*	*/*
Cyanide		Q	Q/Q

Legend

*	Detected, not greater than three times background
[ ]	As value approaches the IDL the quantitation may not be accurate
Q	No analytical result
J	Reported value may not be accurate or precise
--	not detected

Table 1D: Organic contamination detected in the on-site monitoring well samples. Concenrations are recorded as μg/l.

Compound	GW-6
vinyl chloride	2
lindane	.0099 J

Legend

J	Estimated Value

ORIGINAL (Red)

Table 2: Inorganic Analysis of Surface Water Samples. Concentrations are recorded as µg/L.

Analyte	Leachate-1	SW-4 (Background)	SW-1	SW-2	SW-3
Aluminum	3530	378	*	*	--
Arsenic	[2.7]	--	--	[1.1]	--
Barium	*	[49.1]	*	*	*
Beryllium	--	--	--	0.24 B	--
Calcium	*	21800	*	117000	*
Chromium	[5.3]	--	--	--	--
Cobalt	*	[2.7]	*	[37.8]	--
Copper	[15.2]	--	[3.9]	--	--
Iron	12000	195	740	5800	3140
Lead	10.7	[0.40]	1.5	--	--
Magnesium	*	5950	*	44600	[4650]
Manganese	327	77.9	*	3020	429
Nickel	*	[11.9]	*	78.7	--
Potassium	*	[1090]	*	*	[4300]
Sodium	*	5040	*	*	*
Zinc	*	25.5 B	*	*	B

Legend

*	Detected, but not greater than three times background
[ ]	Analyte present. As values approach the IDL the quantitation may not be accurate
--	Not Detected
B	Not detected substantially above the level reported in lab or field blanks
J	Reported Value May Not be Accurate or Precise

In addition, Endosulfan Sulfate at 0.0082 J µg/l and Methoxychlor at 0.019 B µg/l were detected in the leachate sample.

ORIGINAL (Red)

Table 3: Organic Analysis of Sediment Data. Concentrations are recorded as µg/kg.

Compound	Sed-4 (Background)	Sed-1	Sed-2	Sed-3
Toluene		1		
Fluoranthene			120J	
Phenanthrene			130J	56 J
Pyrene			85J	
Benzo[a]Anthracene			110J	
Chrysene			120J	
Benzo[b]Fluoranthene			250 J	
Benzo[k]Fluoranthene			250 J	
Benzo[a]Pyrene			120J	
Indeno-(1,2,3-cd)Pyrene			64J	
4-Methylphenol				62J
4-methylnapthalene			92 J	
4,4-DDE	0.38			

Legend

J	Estimated value
blank space	Not detected

ORIGINAL (Red)

Table 4: Inorganic Results for Sediment Samples. Values are recorded as mg/kg.

Analyte	Sed-4 (Background)	Sed-1	Sed-2	Sed-3
Aluminum	4260	*	*	*
Arsenic	3.6	*	*	*
Barium	86.5	*	*	*
Beryllium	1.7	*	*	*
Cadmium	[0.55]	--	--	--
Calcium	1290	10000	10400	*
Chromium	12.2	*	332	*
Cobalt	54.1	*	180	*
Copper	16.1	*	*	*
Iron	27900	*	*	*
Lead	15.7	*	*	*
Magnesium	[785]	*	*	*
Manganese	1480	*	13500	*
Mercury	--	--	--	--
Nickel	89.1	*	*	*
Potassium	[577]	*	*	*
Selenium	[0.34] L	*	1.8	*
Sodium	[44.4]	*	*	*
Vanadium	[11.7]	*	*	*
Zinc	188 J	*	*	*

Legend

*	Detected, Concentration does not exceed three times background
[ ]	Analyte present. As values approach the IDL the quantitation may not be accurate
--	Not Detected
J	Analyte present. Reported value may not be accurate or precise
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher

ORIGINAL (Red)

Table 5: Organic Results from Soil Samples. Values are recorded as µg/kg

Compound	Soil-1 (Backgd)	Soil-2	Soil-3/Soil-7	Soil-4	Soil-5	Soil-6
Fluoranthene			39J/61J			
Phenanthrene			--/--	47J		
Pyrene			--/55J			
Benzo[b]Fluoranthene			--/61J			
Benzo[k]Fluoranthene			--/61J			
Endosulfan I			0.40J/0.34J			
alpha-BHC			--/--	0.100J		
gamma-Chlordane			--/--	0.41J		
4,4'-DDE			--/--		0.97J	
Endrin Ketone			--/--			0.12J

Legend

J	Estimated Value
--	Not detected
blank space	Not detected

ORIGINAL (Red)

Table 6: Inorganic Results from Soil Samples. Concentrations are recorded as mg/kg

Compounds	S-1 (Backgd)	S-2	S-3/S-7	S-4	S-5	S-6
Aluminum	8270	*	*/*	*	*	*
Arsenic	7.9	*	*/*	*	*	*
Barium	142	*	*/*	*	*	*
Beryllium	[1.1]	*	*/*	*	*	*
Cadmium	[0.42]	--	--/--	--	--	--
Calcium	2640	*	*/*	*	*	*
Chromium	12.0	*	*/*	*	*	*
Cobalt	19.3	*	*/*	*	*	*
Copper	28.7	*	*/*	*	*	*
Iron	33900	*	*/*	*	*	*
Lead	35.0	*	*/*	*	*	*
Magnesium	[1030]	*	*/*	*	*	*
Manganese	1170	*	*/*	*	*	*
Mercury	--	--	0.19/0.16	--	--	--
Nickel	22.2	*	*/*	*	*	*
Potassium	1240	*	*/*	*	*	*
Selenium	[0.35] L	--	*/*	--	*	*
Sodium	[119]	*	*/*	*	*	*
Vanadium	18.3	*	*/*	*	*	*
Zinc	78.0 J	*	*/*	*	*	*
Cyanide	--	--	[0.45]/0.71B	[0.23]	--	--

Legend

*	Detected, Not greater than three times background
[ ]	Analyte present. As values approach the IDL the quantitation may not be accurate
--	Not Detected
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher
J	Analyte present. Reported value may not be accurate or precise

Note: S-3 and S-7 are Duplicate Samples

Table 7: Pesticide data for sediment samples. Values are recorded as $\mu g/kg$.

Contaminant	SED-1	SED-2	SED-3	SED-4 (background)
Lindane		0.079 J		
Heptachlor	0.17 J	0.35 J	0.48 J	0.25 J
Dieldrin		0.072 J		
4,4'-DDE	0.20 J	0.64 J	0.39 J	0.38 J
Endrin		0.47 J		
4,4'-DDD		0.15 J		0.51 J
4,4'-DDT				0.15 J
Endrin ketone	0.18 J	0.31 J		
alpha-chlordane		0.36 J		
gamma-chlordane		0.46 J		0.16 J

Legend

J	Estimated Value
--	Not detected
blank space	Not detected

ORIGINAL (Red)

Table 8: Pesticide data for soil samples. Values are recorded as µg/kg.

Contaminant	S-1 (background)	S-2	S-3/S-7	S-4	S-5	S-6
alpha-BHC		0.25 J		0.100 J		
lindane	0.25 J	0.16 J	0.13 J/nd	0.41 J	0.37 J	0.12 J
heptachlor	0.13 J	0.065 J	/0.094	0.050 J		
aldrin		0.65 J	0.58 J/0.37 J			
Heptachlor epoxide		0.18 J	0.30 J/0.26 J	0.10 J		
Endosulfan I		0.13 J	0.40 J/0.34 J	0.30 J		
dieldrin	0.20 J		/0.33 J			
4,4-DDE					0.97 J	
endrin		0.075 J	0.59 J/0.56 J	0.27 J	0.51 J	
endosulfan sulfate		0.096 J				
4,4'-DDT	0.16 J		/1.3 J		1.2 J	
methoxychlor				9.4 J		
endrin ketone	0.66 J		0.15 J/	0.47	0.17 J	0.12 J
alpha-chlordane			0.55 J/0.48 J	0.39 J		
gamma-chlordane	0.072 J	0.41 J	0.67 J/0.51 J	0.41 J	0.45 J	
endosulfan II			0.31 J/	0.22 J		

Legend

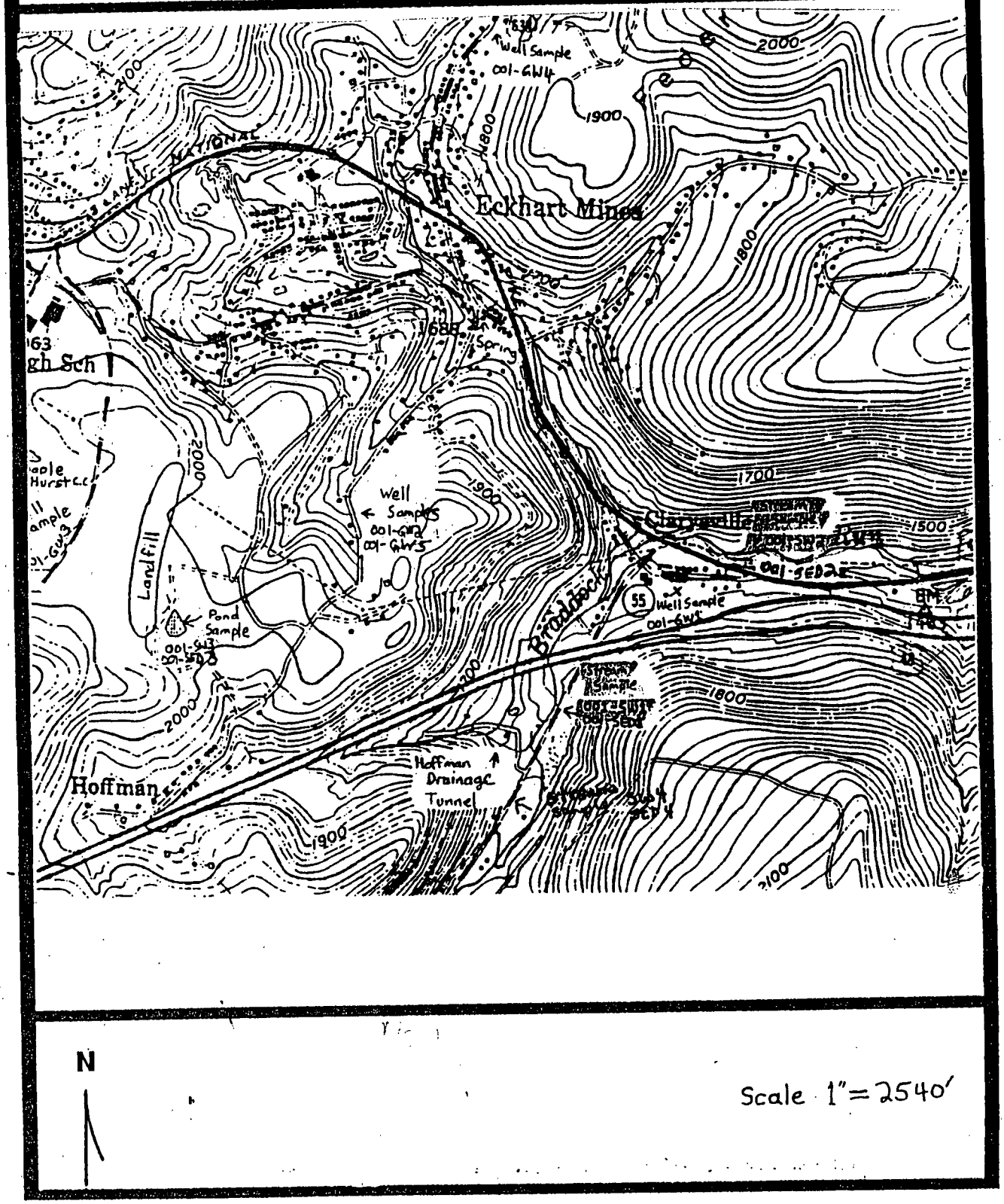
J	Estimated Value
--	Not detected
blank space	Not detected

(Red)

Location of Residential Well Samples

ORIGINAL (Red)

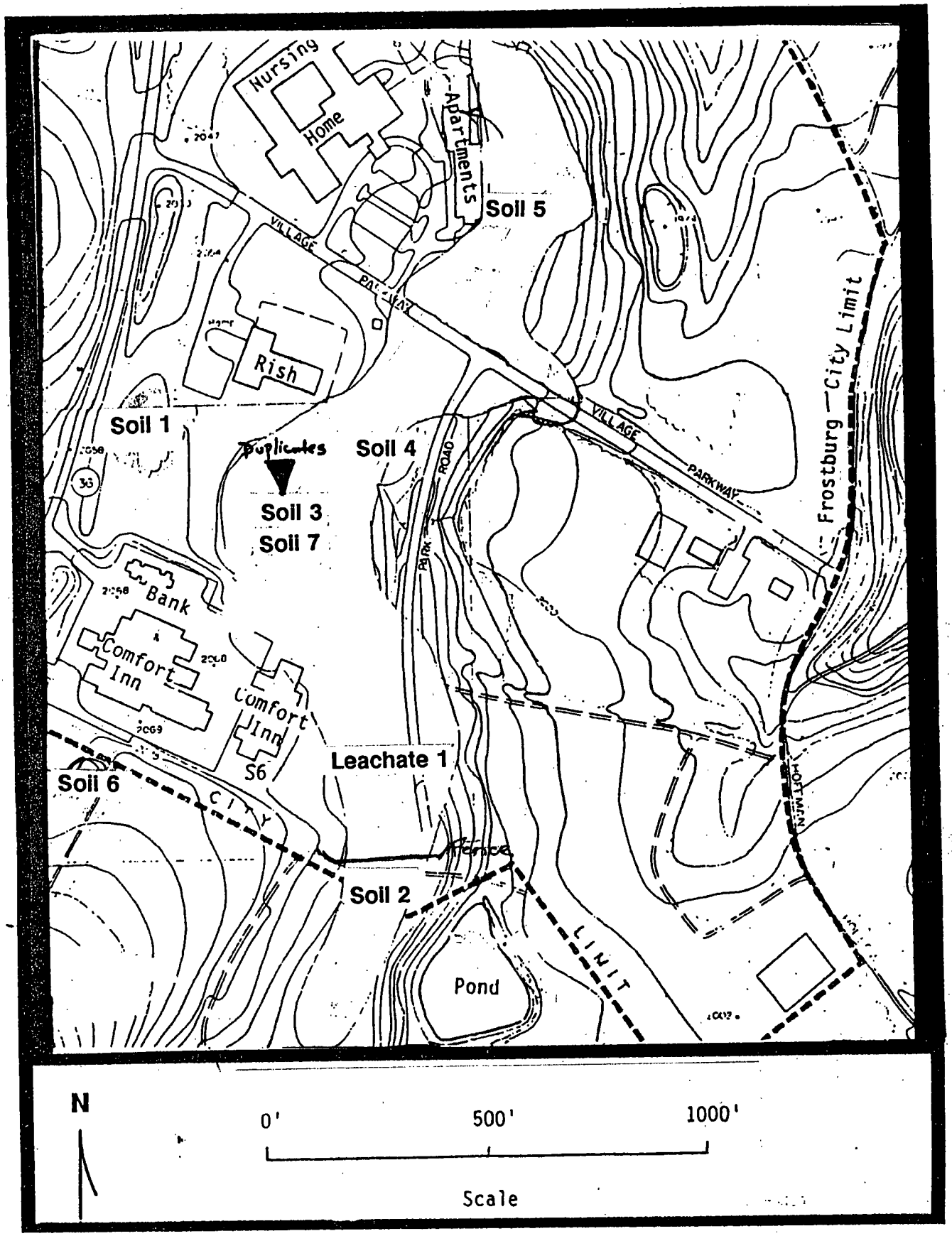
Location of Surface Water Samples



N

Scale 1" = 2540'

Location of Soil Samples



ORIGINAL (Red)

APPENDIX B

ORIGINAL

VII. WASTE RELATED INFORMATION *(continued)*

2. Estimate the amount *(specify unit of measure)* of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT: UNKNOWN	AMOUNT:	AMOUNT:	AMOUNT: UNKNOWN	AMOUNT: 1400 tons	AMOUNT: UNKNOWN
UNIT OF MEASURE:	UNIT OF MEASURE:	UNIT OF MEASURE:	UNIT OF MEASURE:	UNIT OF MEASURE: Total deposit	UNIT OF MEASURE: ~~Oz~~ (Red)
X (1) PAINT, PIGMENTS	X (1) OILY WASTES	X (1) HALOGENATED SOLVENTS	X (1) ACIDS	X (1) FLYASH	X (1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER *(specify)*:	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	X (2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER *(specify)*:	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(5) OTHER *(specify)*:			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER *(specify)*:
			(6) CYANIDE	X (6) OTHER *(specify)*: epoxy-resin fiberglass waste scrap resin, activators and related processing refuse.	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			X (11) OTHER *(specify)*: Solvents		

D. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE *(place in descending order of hazard)*

1. SUBSTANCE	2. FORM *(mark 'X')* a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY *(mark 'X')* a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT
Asbestos	X				X				UNKNOWN	
Epoxy-resin refuse	X				X	X			UNKNOWN	

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

[X] A. HUMAN HEALTH HAZARDS

Results from the sampling well help indicate whether a human health hazard exists due to contaminated surface or groundwater. Possible methane buildup in buildings directly adjacent to the landfill, see VIII B. below.

Continue On Page 5

ORIGINAL (Red)

VIII. HAZARD DESCRIPTION (continued)

☐ T. MIDNIGHT DUMPING

No indication were observed.

☒ U. OTHER (specify):

Allegany County operated three landfills in the immediate are; Hoffman, Cabin Run and Vale Summit. There is no record as to which of these landfills were the final disposal points for industrial or potentially hazardous wastes.

Amcelle, PPG, Hercules and Kelley Springfield filed letters with the Allegany County Engineering Department noting that each had reviewed a state list of designated hazardous substances and that each was not depositing any materials on the list in the landfills, except as noted.

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
1. IN RESIDENTIAL AREAS	estimated 100	0	2 rest-retirement home complexes	<.25 mi.
2. IN COMMERCIAL OR INDUSTRIAL AREAS		0		
3. IN PUBLICLY TRAVELLED AREAS	located <.25 mi. from major highway			
4. PUBLIC USE AREAS (parks, schools, etc.)		0		

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER (specify unit)	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
15 feet	East, possibly northwest	light, domestic and stock
D. POTENTIAL YIELD OF AQUIFER	**E. DISTANCE TO DRINKING WATER SUPPLY (specify unit of measure)**	**F. DIRECTION TO DRINKING WATER SUPPLY**
UNKNOWN	UNKNOWN, Municipal water.	UNKNOWN

G. TYPE OF DRINKING WATER SUPPLY

☐ 1. NON-COMMUNITY <15 CONNECTIONS ☒ 2. COMMUNITY (specify town): >15 CONNECTIONS Frostburg Municipal Water.

☐ 3. SURFACE WATER ☐ 4. WELL

Continue On Page 9

ORIGINAL (Red)

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

C. PHOTOS

1. TYPE OF PHOTOS: [XX] a. GROUND [ ] b. AERIAL
2. PHOTOS IN CUSTODY OF: Ecology and Environment, Inc.

D. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS: Ecology and Environment, Inc.

ORIGINAL (Red)

E. COORDINATES Frostburg, MD 7.5 min. USGS Quad.

1. LATITUDE (deg.-min.-sec.): 39° 37' 35"
2. LONGITUDE (deg.-min.-sec.): 78° 55'

V. SITE INFORMATION

A. SITE STATUS

[ ] 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)

[X] 2. INACTIVE (Those sites which no longer receive wastes.)

[ ] 3. OTHER (specify): _____ (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

[X] 1. NO [ ] 2. YES (specify generator's four-digit SIC Code): _____

C. AREA OF SITE (in acres): 22

D. ARE THERE BUILDINGS ON THE SITE?

[X] 1. NO [ ] 2. YES (specify): Home for aged, small business buildings and equipment storage buildings on the immed. perimeter.

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[ ] 1. STORAGE [ ] 2. INCINERATION [X] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[ ] 1. LIQUID [X] 2. SOLID [X] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [X] 2. IGNITABLE [ ] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE

[X] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [ ] 8. FLAMMABLE

[X] 9. OTHER (specify): Municipal waste; garbage, refuse and sewage sludge.

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

No accurate record of industrial wastes. Company letters to Allegany County give some indication of amounts and types of waste disposed of in landfill.

Continue On Reverse

III. INSPECTION INFORMATION *(continued)*

D. GENERATOR INFORMATION *(sources of waste)*

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
Allegany County Municipal wastes			
Hercules Corp.	304-726-4500	Box 210 Cumberland, Maryland	
Celanese Corp. Amcelle Plant	301-729-1000	Box 444 Cumberland, MD	Asbestos, Resins
Kelly Springfield Tire Corp.	301-777-6000	Kelly Rd. Cumberland, MD	
PPS Industries	301-722-8500	Box 1356 Cumberland MD	

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED
Industrial wastes hauled by private company trucks (Hercules by private/public trash disposal companies).			

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS

G. DATE OF INSPECTION *(mo., day, & yr.)*	H. TIME OF INSPECTION	I. ACCESS GAINED BY: *(credentials must be shown in all cases)*
10/21/80	1300	[X] 1. PERMISSION [ ] 2. WARRANT

J. WEATHER *(describe)*

Sunny, cool - 60°, wind 5-10 mph; clear

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN *(mark 'X')*	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER	X	VERSAR, Washington, DC West Coast Tech. Services, Cerritos, CA	11/29/80
b. SURFACE WATER	X	VERSAR, Washington, DC West Coast Tech. Services, Cerritos, CA	11/29/80
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL			
h. VEGETATION			
i. OTHER *(specify)*			

B. FIELD MEASUREMENTS TAKEN *(e.g., radioactivity, explosivity, PH, etc.)*

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS
None taken		

Continue On Page 3

Continued From Front

II. INSPECTION INFORMATION (continued)

D. GENERATOR INFORMATION (sources of waste)

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
Allegany Co Municipal Wastes			
Amcelle	C.E. McLain 301-729-1000	Celanese Corp. P.O. Box 444 Cumberland, MD 21502	organic resins Solvents, asbestos
Kelly Tire	301-777-6000	Cumberland	Rubber wastes

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS

G. DATE OF INSPECTION (mo., day, & yr.)	H. TIME OF INSPECTION	I. ACCESS GAINED BY: (credentials must be shown in all cases)
5-21-80	0930	☒ 1. PERMISSION ☐ 2. WARRANT

J. WEATHER (describe)
Partly cloudy humid 70°F

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER			
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL			
h. VEGETATION			
i. OTHER (specify)			

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.)

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS

 Continue On Page 3

ORIGINAL (Red)

ECOLOGY & ENVIRONMENT, INC. FIELD INVESTIGATION TEAM

SITE SAFETY PLAN

SITE: Hoffman Landfill
LOCATION: Frostburg, Maryland

DATE: October 17, 1980
PREPARER: Anthony A. Fuscaldo
TDD NO.: F3-8009-07

INVESTIGATIVE OBJECTIVE(S): Site Sampling/Site Inspection

PROPOSED DATE OF INVESTIGATION 10/20/80

BACKGROUND REVIEW: COMPLETE [x] PRELIMINARY [ ]

DOCUMENTATION/SUMMARY: OVERALL HAZARD SERIOUS [ ] MODERATE [x] UNKNOWN [ ]

SITE/WASTE CHARACTERISTICS

WASTE TYPE(S): LIQUID [x] SOLID [x] SLUDGE [x] GAS [ ]

CHARACTERISTIC(S): CORROSIVE [ ] IGNITABLE [ ] RADIOACTIVE [ ] VOLATILE [ ]
TOXIC [ ] REACTIVE [ ] UNKNOWN [ ] OTHER [ ]

FACILITY DESCRIPTION: SIZE BUILDINGS
TOPOGRAPHY Landfill

PRINCIPAL DISPOSAL METHOD (type & location)

UNUSUAL FEATURES (dike integrity, power lines, terrain, etc.)

STATUS (open, closed, unknown) Closed

HISTORY (worker or non-worker injury; complaints from public; previous agency action):
Methane monitoring going on at the Hoffman Landfill.

HAZARD EVALUATION

Low hazard. Landfill is completely capped and is used as a pasture. Sampling from wells and pond on top of the landfill at Level D. Air monitoring for Trichlorofloro methane build-up in old age home located just off site. One hundred parts per billion in crawl space under the home. The Hoffman drainage tunnel is an outdoor drain for underground mine system, due to the possibility, splash aprons and eye protection will be worn on this site. If a leachate stream is present, the team will use Level B protection to sample it.

ORIGINAL (R...

New Jersey Department of Health

HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **CARBON BLACK**

CAS Number: 1333-86-4
DOT Number: UN 1361

RTK Substance number: 0342
Date: Jan. 1986 Revision: Aug. 1992

HAZARD SUMMARY

* Carbon Black can affect you when breathed in.
* Overexposure can cause cough with phlegm.
* Repeated exposure may scar the lungs and reduce lung function, with possible shortness of breath. These changes usually develop slowly over many years.
* Carbon Black may be contaminated with *Polycyclic Aromatic Hydrocarbons* (PAH's). PAH's have been shown to cause cancer. *CONSULT THE NEW JERSEY DEPARTMENT OF HEALTH HAZARDOUS SUBSTANCE FACT SHEET ON BENZO(a)PYRENE* for further information on PAH's and ask your employer about PAH contamination.

IDENTIFICATION

Carbon Black is a black, odorless solid (powder, pellets or paste). It is used in making tire treads, in abrasion resistant rubber products, and as a pigment for paints and inks.

REASON FOR CITATION

* Carbon Black is on the Hazardous Substance List because it is regulated by OSHA and cited by NIOSH, ACGIH, DOT and IARC.
* Definitions are provided on page 5.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.20.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

OSHA: The legal airborne permissible exposure limit (PEL) is 3.5 mg/m^3 averaged over an 8-hour workshift. (Final Rule, January 1989).

NIOSH: The recommended airborne exposure limit is 3.5 mg/m^3, or 0.1 mg/m^3 if it contains PAH's, averaged over a 10-hour workshift.

ACGIH: The recommended airborne exposure limit is 3.5 mg/m^3 averaged over an 8-hour workshift.

WAYS OF REDUCING EXPOSURE

* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly <u>immediately</u> after exposure to Carbon Black and at the end of the workshift.
* If Carbon Black contains more than 0.1% PAH's, it should be used, handled and stored in a regulated area in the same manner as a carcinogen.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of Carbon Black to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to Carbon Black:

* Overexposure can cause cough with phlegm. This usually clears up after exposure is properly controlled, but if such exposures are repeated over many months or years, long lasting lung effects may occur.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to Carbon Black and can last for months or years:

Cancer Hazard

* Carbon Black may contain several substances which are known carcinogens (such as *Benzo(a)pyrene*). Whether or not it poses a cancer hazard needs further study. It should be handled with caution.

Reproductive Hazard

* According to the information presently available to the New Jersey Department of Health, Carbon Black has not been tested for its ability to affect reproduction.

Other Long-Term Effects

* Repeated exposure may cause lung scarring, visible on chest x-ray, and/or some loss of lung function, with shortness of breath. These changes usually develop slowly over a period of many years, and are not curable.
* If Carbon Black is contaminated with PAH's, skin rashes and other skin changes, including growths, can occur.

MEDICAL

Medical Testing

For those with frequent or potentially high exposure (half the TLV or greater), the following are recommended before beginning work and at regular times after that:

* Chest x-ray (to be read by a special NIOSH "B reader" radiologist).
* Lung function tests.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

Mixed Exposures

Because smoking can cause heart disease, as well as lung cancer, emphysema, and other respiratory problems, it may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

* Where possible, automatically transfer Carbon Black from drums or other storage containers to process containers.
* Specific engineering controls are recommended for this chemical by NIOSH. Refer to the NIOSH criteria document: *Occupational Exposure to Carbon Black #78-204*.

Good WORK PRACTICES can help to reduce hazardous exposures. The following work practices are recommended:

* Workers whose clothing has been contaminated by Carbon Black should change into clean clothing promptly.
* If there is the possibility of skin exposure, emergency shower facilities should be provided.
* Do not take contaminated work clothes home. Family members could be exposed.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to Carbon Black.
* On skin contact with Carbon Black, immediately wash or shower to remove the chemical. At the end of the workshift, wash any areas of the body that may have contacted Carbon Black, whether or not known skin contact has occurred.
* Do not eat, smoke, or drink where Carbon Black is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.
* Do not dry sweep for clean-up. Use a vacuum or a wet method to reduce dust during clean-up.
* If Carbon Black contains more than 0.1% PAH's it should be handled with caution as a CARCINOGEN.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

* Avoid skin contact with Carbon Black. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

* Wear dust-proof goggles when working with powders or dust, unless full facepiece respiratory protection is worn.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

* Where the potential exists for exposures over 3.5 mg/m^3, use a MSHA/NIOSH approved respirator equipped with particulate (dust/fume/mist) filters. More protection is provided by a full facepiece respirator than by a half-mask respirator, and even greater protection is provided by a powered-air purifying respirator. Particulate filters must be checked every day before work for physical damage, such as rips or tears, and replaced as needed.
* If while wearing a filter, cartridge or canister respirator, you can smell, taste, or otherwise detect Carbon Black, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator-to-face seal is still good. If it is, replace the filter, cartridge, or canister. If the seal is no longer good, you may need a new respirator.
* Be sure to consider all potential exposures in your workplace. You may need a combination of filters, prefilters, cartridges, or canisters, to protect against different forms of a chemical (such as

vapor and mist) or against a mixture of chemicals.

* Where the potential for high exposures to Carbon Black exists, or if it contains greater than 0.1% PAH's, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in the positive pres sure mode or with a full facepiece, hood, or helmet in the continuous flow mode, or use a MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems.

Q: Don't all chemicals cause cancer?
A: No. Most chemicals tested by scientists are not cancer-causing.

The New Jersey State Department of Health Occupational Health Service offers multiple services in occupational health. These include: Right to Know Information Resources, Public Presentations, General References, Industrial Hygiene Information, Surveys and Investigations, and Medical Evaluation. Consult another Fact Sheet for a more detailed description of these services or call (609) 984-1863.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

A carcinogen is a substance that causes cancer.

The CAS number is assigned by the Chemical Abstracts Service to identify a specific chemical.

A combustible substance is a solid, liquid or gas that will burn.

A corrosive substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEPE is the New Jersey Department of Environmental Protection and Energy.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A fetus is an unborn human or animal.

A flammable substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The flash point is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

HHAG is the Human Health Assessment Group of the federal EPA.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A miscible substance is a liquid or gas that will evenly dissolve in another.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A mutagen is a substance that causes mutations. A mutation is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A reactive substance is a solid, liquid or gas that releases energy under certain conditions.

A teratogen is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The vapor pressure is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

ORIGINAL

>>>>>>>>>>>>>>>>> E M E R G E N C Y I N F O R M A T I O N <<<<<<<<<<<<<<<<<

Common Name: **CARBON BLACK**
DOT Number: UN 1361
DOT Emergency Guide code: 32
CAS Number: 1333-86-4

Hazard rating	NJ DOH	NFPA
FLAMMABILITY	Not Found	Not Rated
REACTIVITY	Not Found	Not Rated
POISONOUS GASES ARE PRODUCED IN FIRE COMBUSTIBLE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

* Carbon Black is a COMBUSTIBLE SOLID.
* POISONOUS GASES ARE PRODUCED IN FIRE.
* Use sand or dry chemical, water spray or foam extinguishers.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If Carbon Black is spilled, take the following steps:

* Restrict persons not wearing protective equipment from area of spill until clean-up is complete.
* Remove all ignition sources.
* Collect powdered material in the most convenient and safe manner and deposit in sealed containers.
* It may be necessary to contain and dispose of Carbon Black as a HAZARDOUS WASTE. Contact your Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEPE HOTLINE: (609) 292-7172

HANDLING AND STORAGE

* Prior to working with Carbon Black you should be trained on its proper handling and storage.
* Carbon Black is not compatible with OXIDIZERS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES and NITRATES).
* Sources of ignition, such as smoking and open flames, are prohibited where Carbon Black is used, handled, or stored in a manner that could create a potential fire or explosion hazard.
* If Carbon Black contains more than 0.1% PAH's, it should be used, handled and stored in a regulated area in the same manner as a carcinogen.

FIRST AID

In NJ, POISON INFORMATION 1-800-962-1253

Eye Contact

* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids.

Skin Contact

* If PAH contamination is present, wash skin promptly after skin contact.

Breathing

* Remove the person from exposure.
* Transfer promptly to a medical facility.

PHYSICAL DATA

Water Solubility: Insoluble

OTHER NAMES

C.I. Pigment Black 7; Channel Black; Lamp Black; Furnace Black

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Not intended to be copied and sold for commercial purposes.

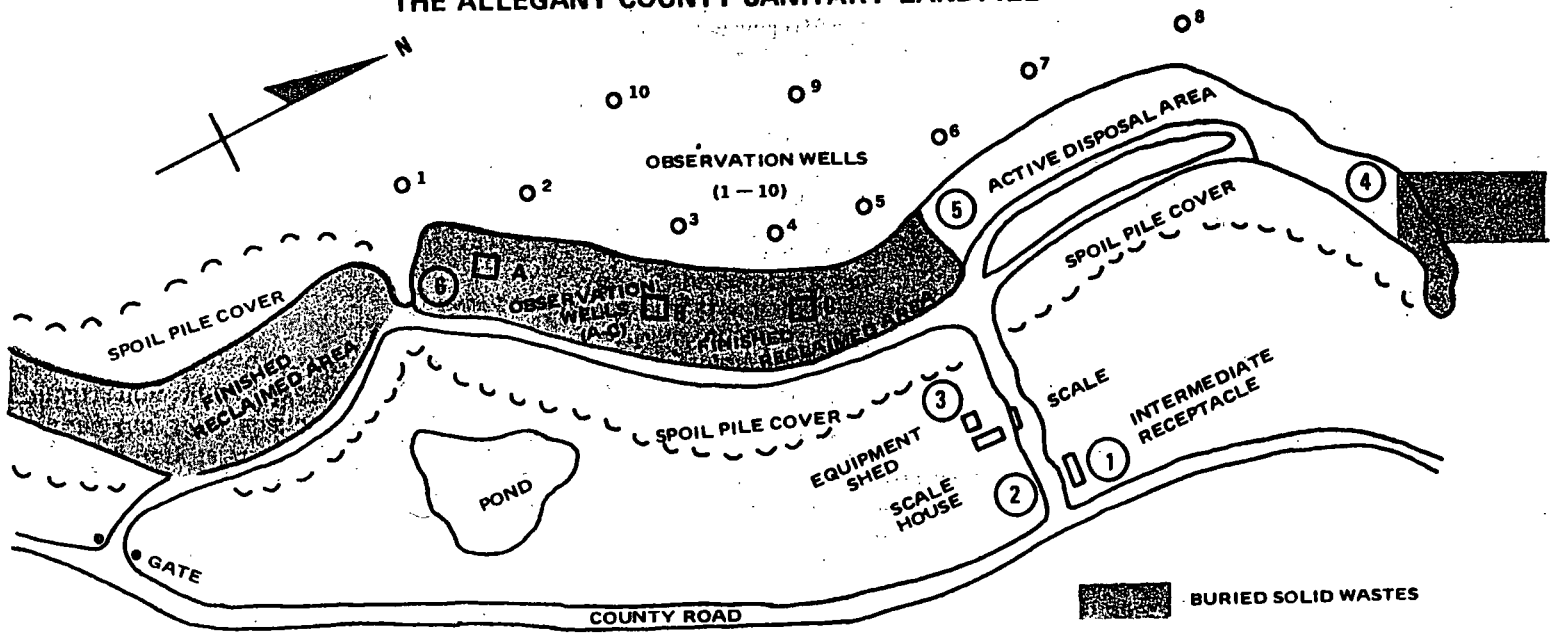
NEW JERSEY DEPARTMENT OF HEALTH
Right to Know Program
CN 368, Trenton, NJ 08625-0368
(609) 984-2202

ORIGINAL (Red)

APPENDIX C

ORIGINAL (Red)

THE ALLEGANY COUNTY SANITARY LANDFILL



Intermediate Receptacle (1)

A convenient disposal area for people who have no regular refuse collection service or who have only a small amount of trash which haulers will not accept. Near the landfill entrance, it prevents accidents by keeping small vehicles out of the active disposal area. Available 24 hours a day and lighted at night.

Scale House(2)

This mobile trailer has a scale with a print-out system which records time, date, vehicle, tonnage of wastes, type and source of refuse, and weather. With this print-out equipment, actual tonnage input can be accounted for, and it provides a means to budget money on a cost per ton basis. The statistical data collected is used to schedule maintenance activities during anticipated slack periods.

Equipment Shed (3)

Stores equipment and supplies for maintenance and repairs.

Finished Reclaimed Area (4)

An average of 50 feet of compacted refuse is buried under the top soil and vegetation in this area which was graded according to the land's natural contour. It is planted with several varieties of grasses and trees to determine which will grow best. The plant cover studies are coordinated with the University of Maryland's Extension Service.

Active Disposal Area (5)

Refuse is deposited, compacted and covered with six inches of compacted earth daily. At present, 30 feet of refuse is buried here; after another 15 feet is buried, the section will be graded and planted. Vegetation used will be selected on the basis of the plant cover studies. More cover material is available from nearby spoil piles left by the mining operation.

Research (6)

Ground water observation wells (1 – 10) are in the undisturbed ground and provide a means for studying ground water movement and quality. Landfill observation wells (A, B, C) in a completed area, provide a method for collecting gasses and liquids for analysis of decomposition. Settlement pads in the finished area measure the amount of solid wastes settling which has occurred since the area was completed.

ORIGINAL (Red)

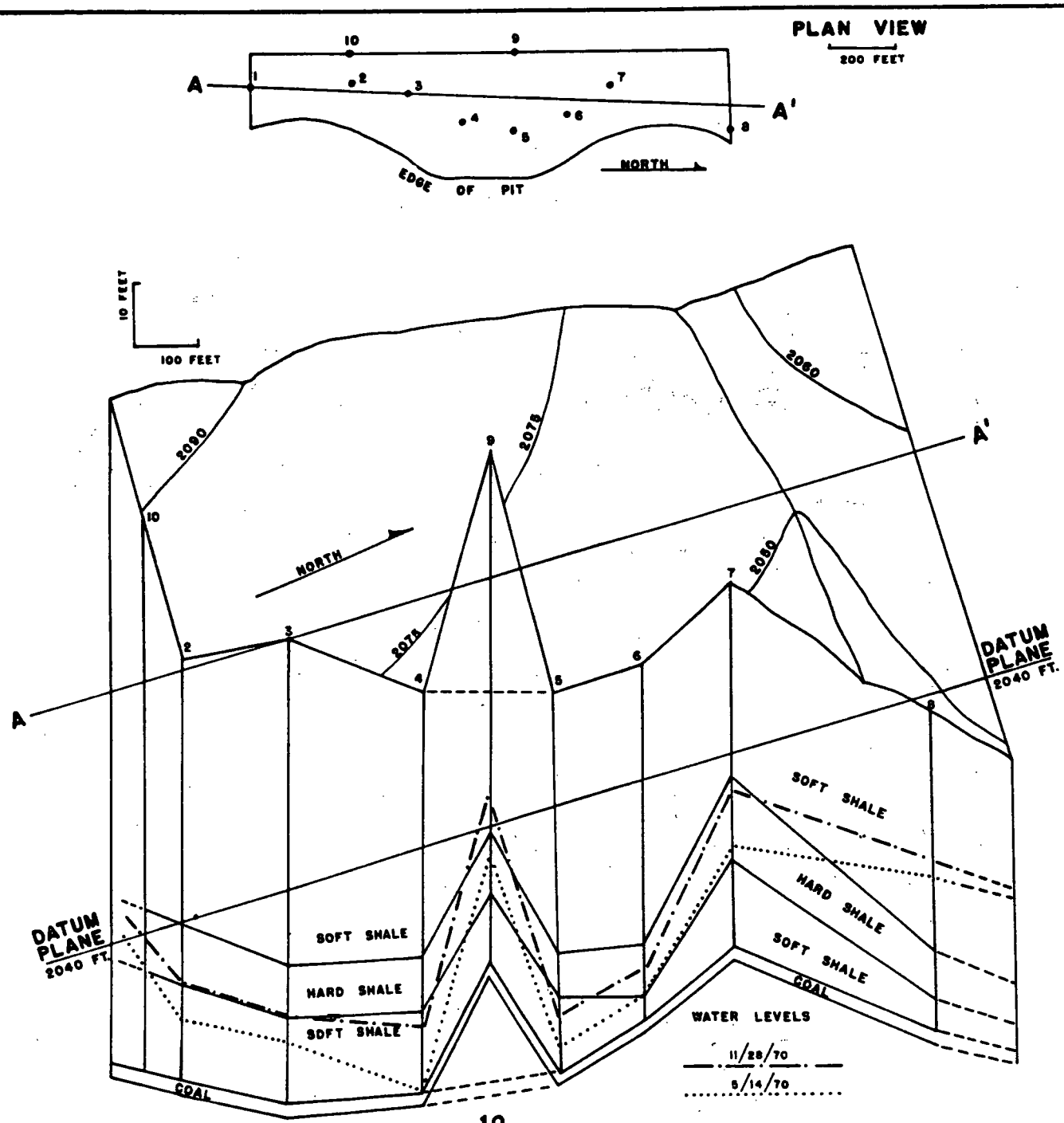


FIGURE NO. 10
THREE DIMENSTIONAL FENCE FIGURE
(WEST WALL)
FROSTBURG SITE NO. 1

EDWARD L. NEWELL, JR. M.C.E.
BRUCE D. MARTIN, PH.D.
DEC. 1970

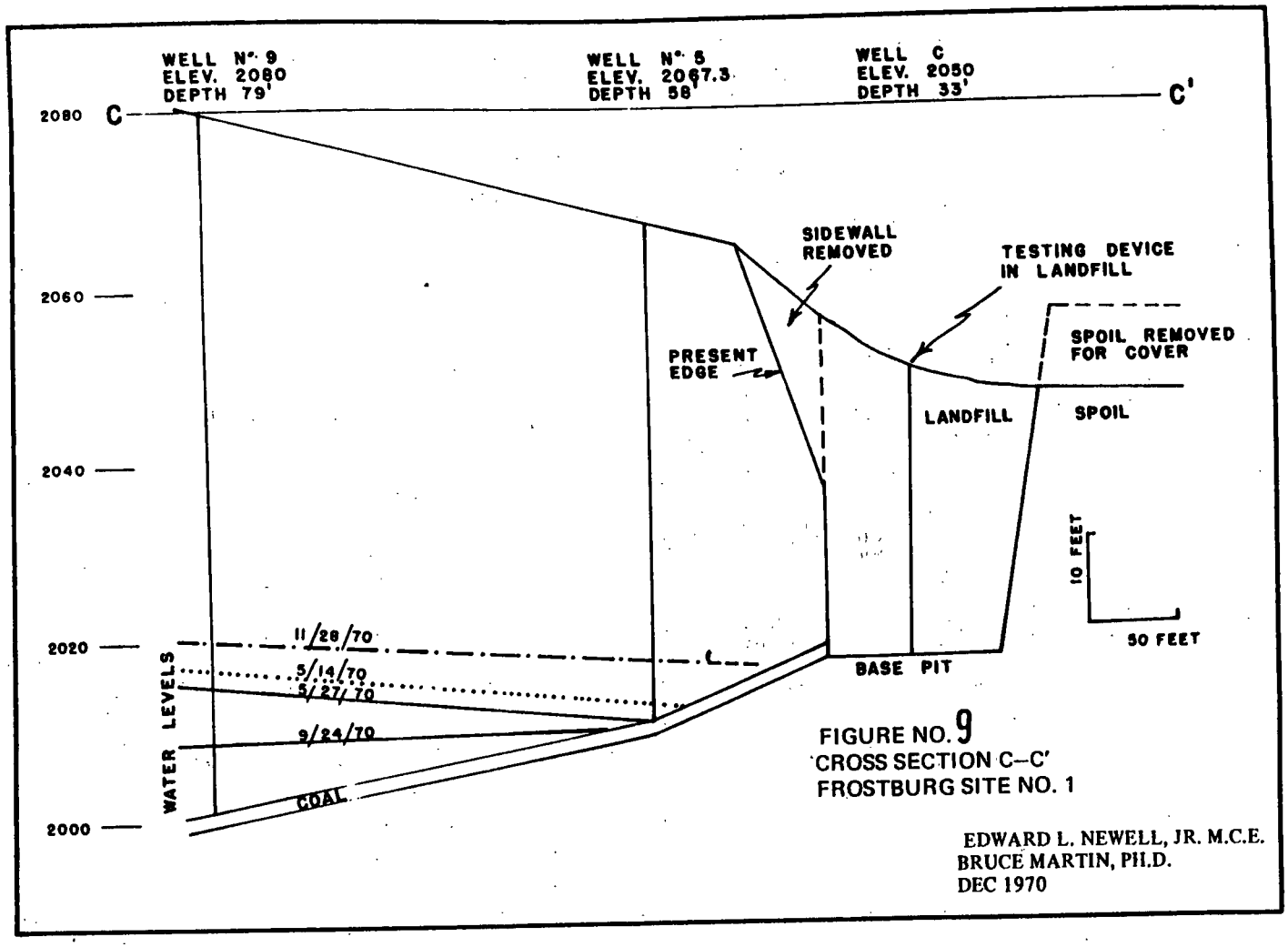


FIGURE NO. 9
CROSS SECTION C–C'
FROSTBURG SITE NO. 1

EDWARD L. NEWELL, JR. M.C.E.
BRUCE MARTIN, PH.D.
DEC 1970

ORIGINAL (Red)

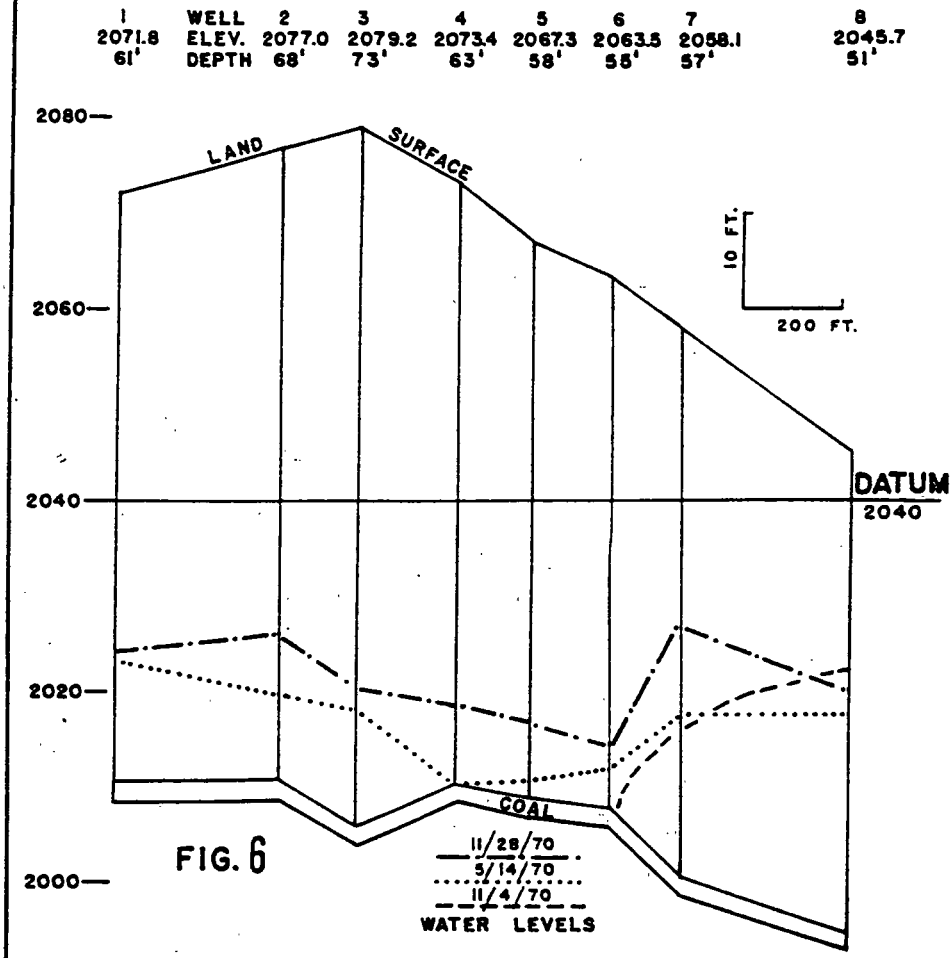


FIG. 6

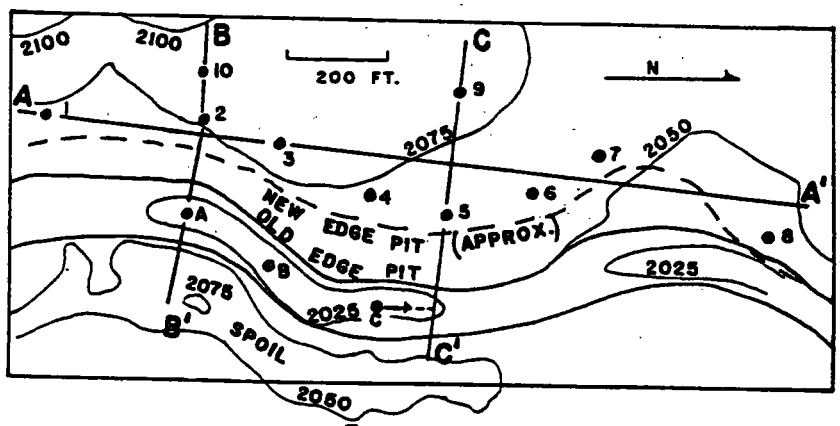
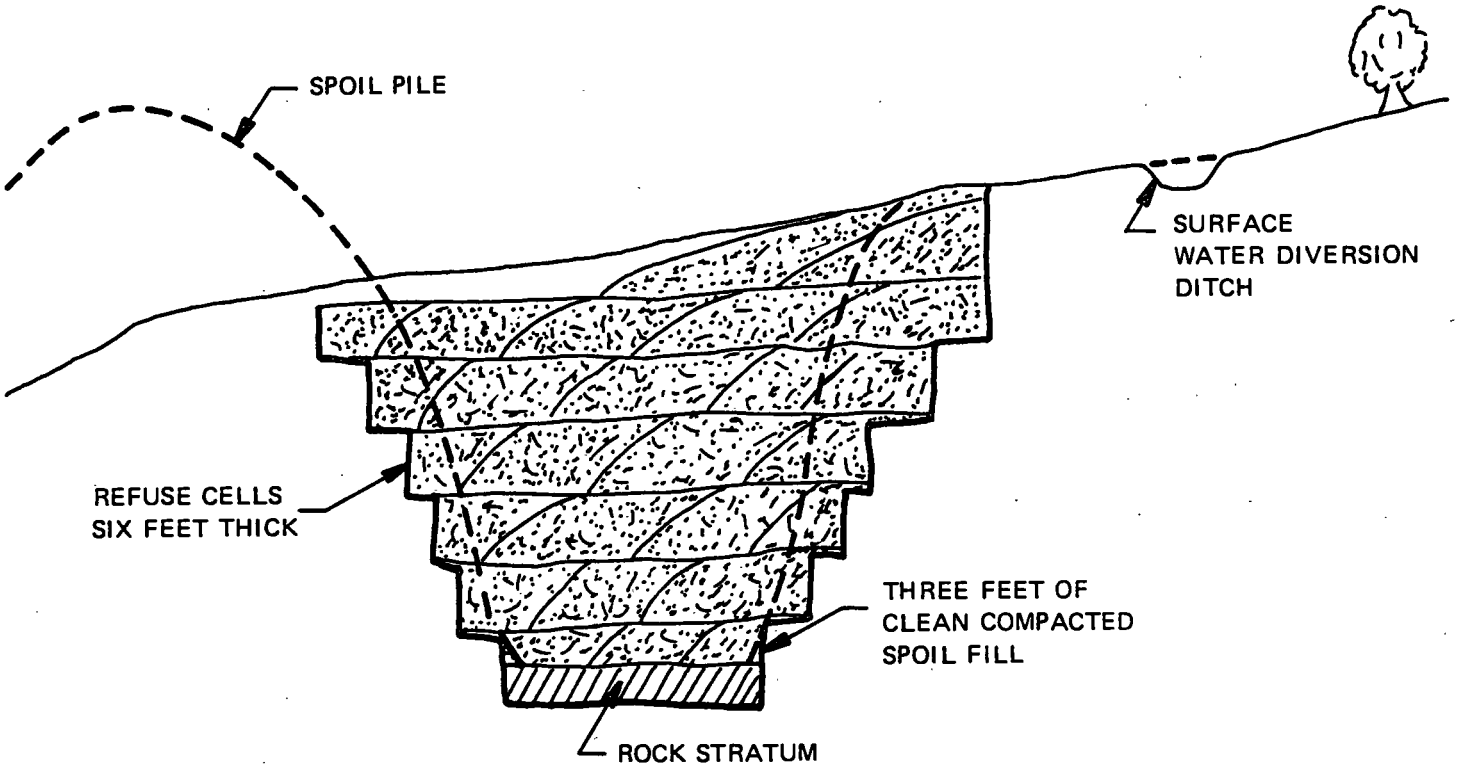


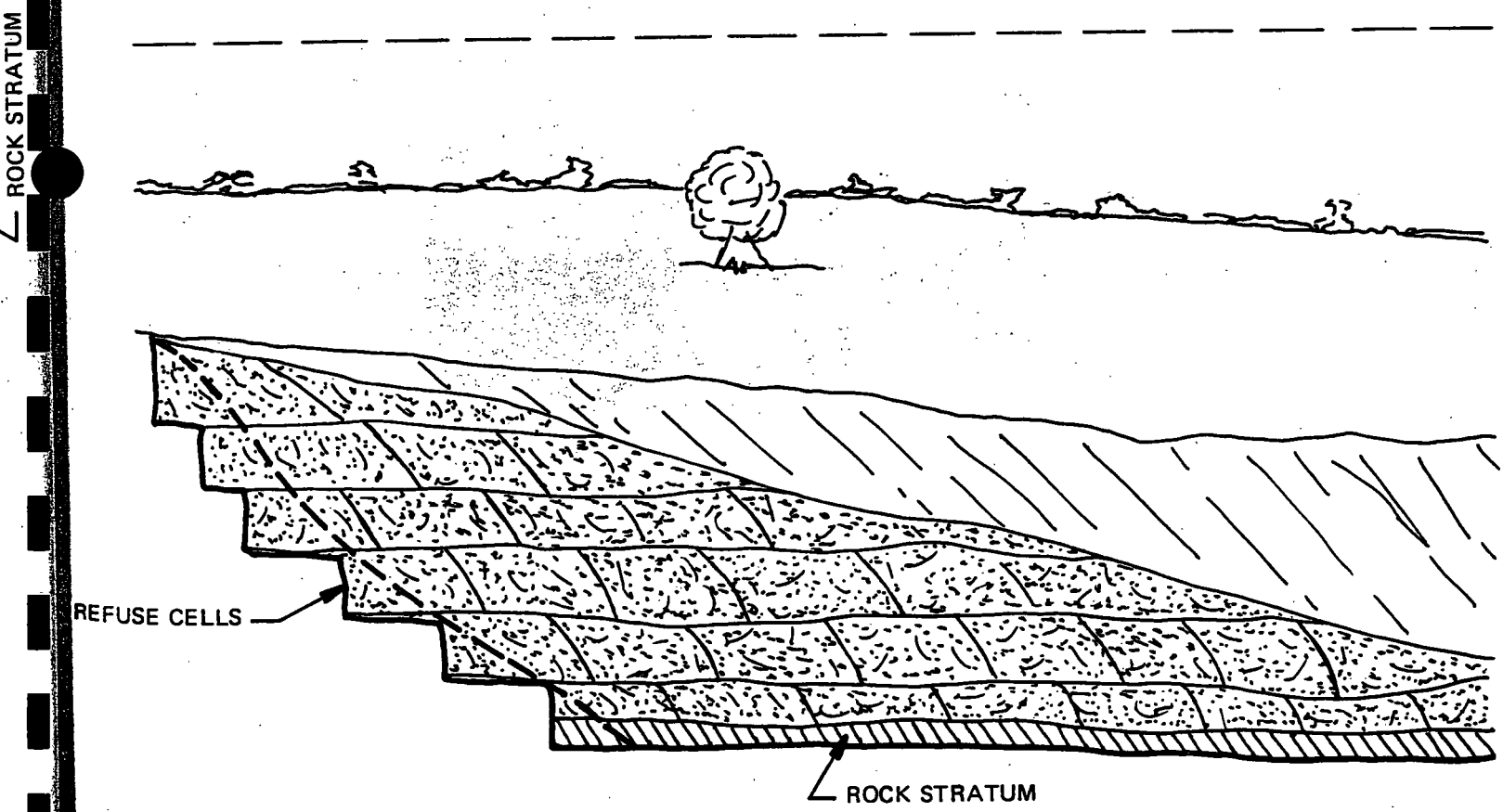
FIGURE NO. 5
CONTOURS IN PIT AND SPOIL AREA
(PRE–LANDFILL)
FROSTBURG SITE NO. 1

EDWARD L. NEWELL, JR. M.C.E.
BRUCE D. MARTIN, PH.D.
DEC. 1970

FIGURE NUMBER 3
CROSS SECTIONS OF MINE PIT FILLING OPERATION

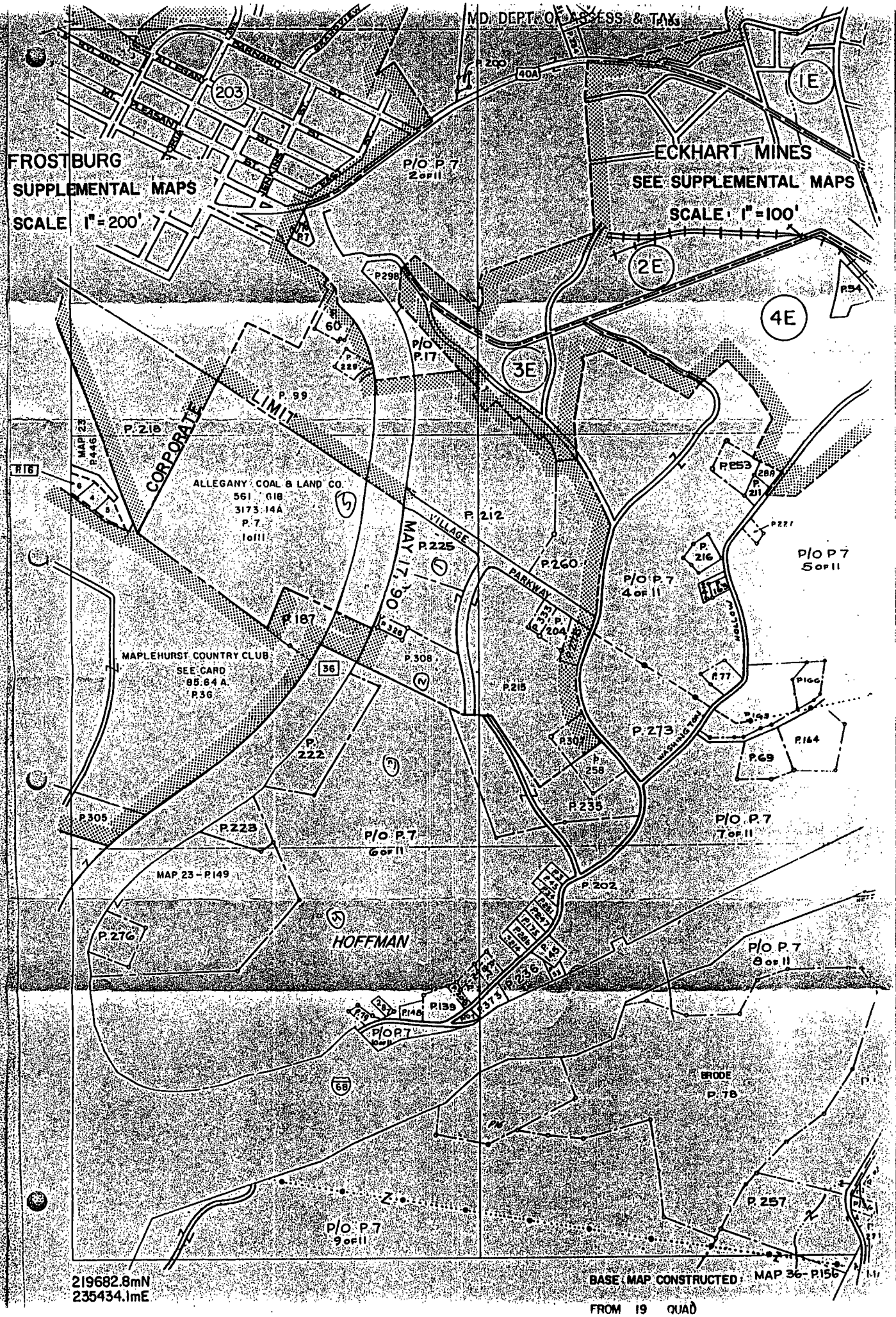
ORIGINAL (Red)





ORIGINAL
(Red)

APPENDIX D


FROSTBURG
SUPPLEMENTAL MAPS
SCALE 1" = 200'
ECKHART MINES
SEE SUPPLEMENTAL MAPS
SCALE: 1" = 100'
203
1E
2E
3E
4E
P/O P 7
2 OF 11
P/O P 7
5 OF 11
P/O P 7
4 OF 11
P/O P 7
7 OF 11
P/O P 7
6 OF 11
P/O P 7
8 OF 11
P/O P 7
9 OF 11
P/O P 7
10 OF 11
P/O P 17
CORPORATE LIMIT
ALLEGANY COAL & LAND CO.
561 618
3173.14A
P. 7
1 of 11
MAPLEHURST COUNTRY CLUB
SEE CARD
85.64 A.
P. 36
MAY 17, '90
VILLAGE PARKWAY
WASHINGTON
HOFFMAN
BRODE
P. 78
MAP 23 - P. 149
MAP 36 - P. 156
219682.8mN
235434.1mE
BASE MAP CONSTRUCTED FROM 19 QUAD

ORIGINAL
(Red)

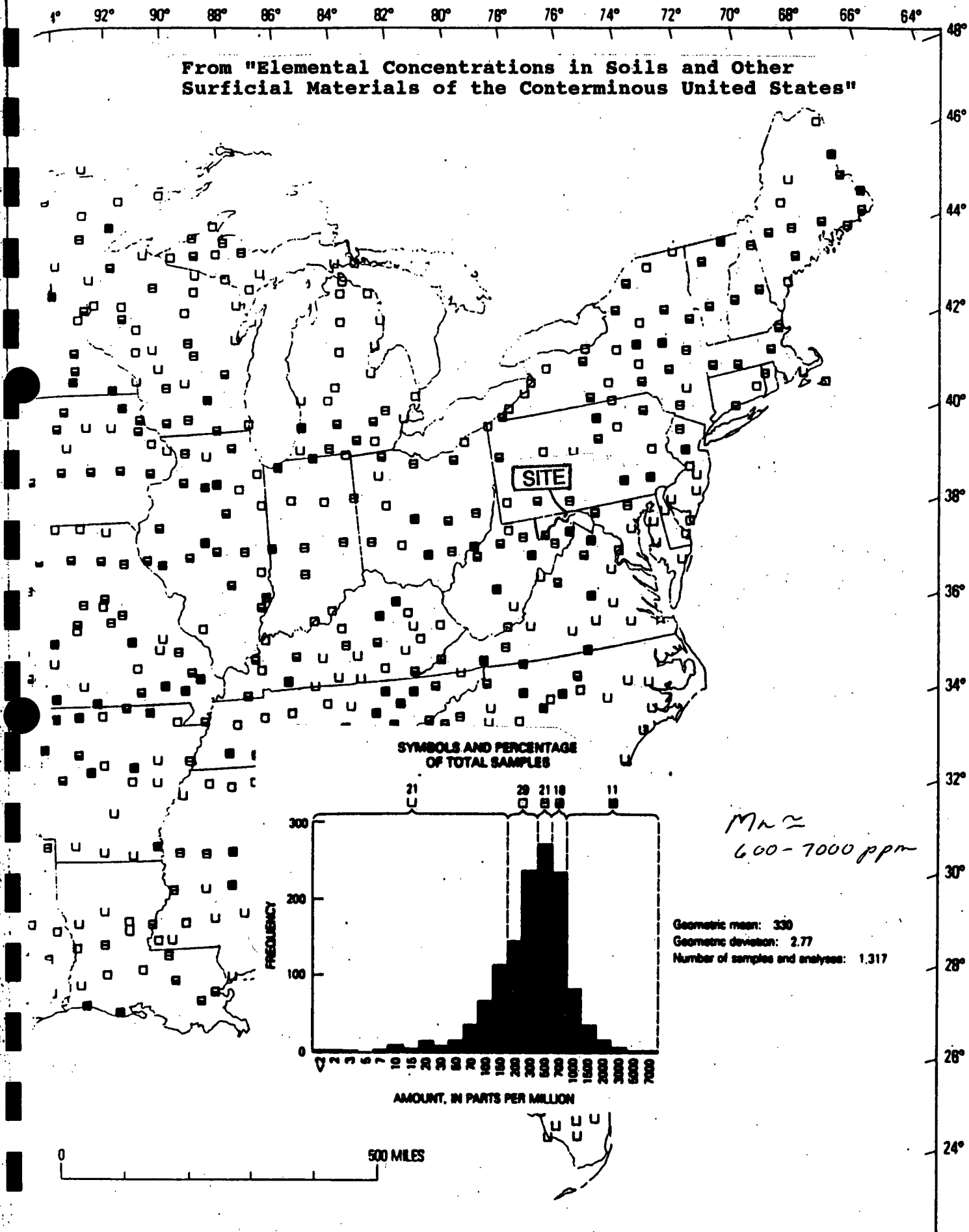
[redacted]

[redacted]

[redacted]

APPENDIX E

MANGANESE[25]



Mn ≈ 600-7000 ppm

APPENDIX F

Concentrations Detected from the Hoffman Drainage Tunnel

Major Constituents in Coal Mine Drainage		
Compound	Date of Collection	Concentration Detected (mg/l)
Silica	8-27-70	13
Aluminum	8-27-70	0
Iron	8-27-70	12
Manganese	8-27-70	3.7
Sodium	8-27-70	4.8
Potassium	8-27-70	1.8
Copper	8-27-70	0
Zinc	8-27-70	0.17
Sulfate	8-27-70	579

Minor Constituents in Coal Mine Drainage		
Compound	Date of Collection	Detected Concentration (µg/l)
Aluminum	August 27, 1970	500
Antimony	August 27, 1970	< 23
Arsenic	August 27, 1970	10
Barium	August 27, 1970	13
Beryllium	August 27, 1970	< 1
Boron	August 27, 1970	14
Cadmium	August 27, 1970	3
Chromium	August 27, 1970	3
Cobalt	August 27, 1970	70
Copper	August 27, 1970	< 1
Lead	August 27, 1970	< 5
Manganese	August 27, 1970	4,000
Mercury	August 27, 1970	--
Nickel	August 27, 1970	190

Selenium	August 27, 1970	0
Silver	August 27, 1970	< 0.4
Vanadium	August 27, 1970	< 5
Zinc	August 27, 1970	1,000

11.0 ATTACHMENTS

ORIGINAL
(Red)

ATTACHMENT I

ORIGINAL (Red)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III
CENTRAL REGIONAL LABORATORY
201 DEFENSE HIGHWAY
SUITE 200
ANNAPOLIS, MARYLAND 21401

QUALITY
ASSURANCE
BRANCH

DATE : April 11, 1994

SUBJECT: Region III Data QA Review

FROM : Cynthia E. Caporale C. Caporale
Region III ESAT RPO (3ES30)

TO : Michele Mosco
State of Maryland

Attached is the organic data validation report for the Hoffman Landfill Site (Case 21162) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III ESD.

If you have any questions regarding this review, please call me at (410) 573-6832.

Attachment

cc: Mike Taurino, RPM, w/o attachment (3HW73)
Regional CLP TPO: Moira Lataille Region: I Lab Code: ABB

TID File: 03940333

CERCLA

APR 14 1994

Projects Division

Lockheed
Environmental Systems & Technologies Co.

Environmental Services Assistance Teams
Region 3
1419 Forest Drive, Suite 104
Annapolis, Maryland 21403

Phone: (410) 268-7705
Fax: (410) 268-8472

DATE: April 08, 1994

SUBJECT: Organic Data Validation For Case 21162
Site: Hoffman LF

FROM: Mahmoud Hamid MH
Senior Oversight Chemist

Mahboobeh Mecanic MM
Senior Oversight Chemist

TO: Cynthia E. Caporale
ESAT Regional Project Officer

THROUGH: Dale S. Boshart MM
ESAT Team Manager

OVERVIEW

Case 21162 was submitted to ABB-ES laboratories (ABB) for full organic analysis. The case consisted of fourteen (14) aqueous and fifteen (15) soil samples. The case included one (1) trip blank that was analyzed for volatiles only, one (1) field blank and one (1) field duplicate pair for each matrix. The samples were analyzed as a Contract Laboratory Program (CLP) Routine Analytical Service (RAS).

SUMMARY

All samples were successfully analyzed for all target compounds, except for the quantitation limits of 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol in the semivolatile analyses of several samples. All other instrument and method sensitivities were according to the Contract Laboratory Program (CLP) Routine Analytical Service (RAS) protocol.

MAJOR PROBLEM

- In the semivolatile analyses, target compounds 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol had a relative response factors (RRFs) less than 0.05 (<0.05) in several initial and continuing calibrations. Quantitation limits were qualified "R" on the data summary forms (DSFs) in the affected samples.

MINOR PROBLEMS

- Several compounds failed precision criteria in the volatile and semivolatile initial and/or continuing calibrations. The positive results were qualified "J", except when superseded by the "B" qualifier, and when the percent relative standard deviation (%RSD) or the percent difference (%D) was greater than fifty percent (>50%), the quantitation limits were qualified "UJ" for these compounds in the affected samples.

- In the volatile analyses, samples CJW01, CJW02, CJW04, and CJW09 had one (1) or more internal standards outside the QC limits. Reanalyses of the above samples produced similar results for CJW01 and CJW04 and better QC results for samples CJW02 and CJW09. Results from initial analyses of samples CJW01 and CJW04, and from the reanalyses of samples CJW02 and CJW09 were reported on the DSFs. Quantitation limits for compounds quantitated using any of the failed internal standards were qualified "UJ", and positive results were qualified "J", except when superseded by the "B" qualifier.

- In the semivolatile analyses, samples CJW08, CJW09 and CJW14 had one (1) or two (2) internal standards outside the QC limits. Sample CJW14 was not reanalyzed because of analyst error. Reanalyses of sample CJW09 yielded similar results. Reanalysis of sample CJW08 produced better QC results. Results from the initial analyses of samples CJW09 and CJW14 and the reanalysis of sample CJW08 were reported on the DSFs. Quantitation limits for compounds quantitated using any of the failed internal standards were qualified "UJ", and positive results were qualified "J", except when superseded by the "B" qualifier.

- The semivolatile extraction of sample CKW92RE was performed twenty (20) days after the date of sample collection. Although no technical holding time for the extraction of semivolatiles in soil samples has been established, the technical holding time of seven (7) days for aqueous samples has been exceeded by thirteen (13) days. The aqueous sample holding time was applied. The quantitation limits were qualified "UJ" and positive results were qualified "J" except, when superseded by the "B" qualifier.

- In the pesticide/PCB analyses, samples CJW13 and CJW18 had two (2) surrogate recoveries outside the lower QC limits on both columns. The quantitation limits were qualified "UJ". No positive results were detected. Sample CJW12 had three (3) surrogate recoveries outside the lower QC limits on both columns. Quantitation limits were qualified "UL". No positive results were detected.

- The "P" qualifier used in the pesticide/PCB Form Is denotes a percent difference greater than twenty-five percent (>25%) between the two (2) columns used for the analyses. These results were qualified "J" on the DSFs.

NOTES

- The maximum concentrations of all compounds found in the analyses of the trip, field and laboratory method blanks are listed below. Samples with concentrations of common laboratory contaminants less than ten times (<10X) the blank concentration or with concentration of other contaminants less than five times (<5X) the blank concentration have been qualified "B" on the DSFs.

Compound	Concentration
Methylene chloride*	4 J ug/kg
Acetone*	13 ug/kg
Chloroform	1 J ug/l
1,2-Dichloroethane	2 J ug/l
1,1,2,2-Tetrachloroethane	2 J ug/l
Toluene	1 J ug/l
Chlorobenzene	1 J ug/l
Total xylenes	2 J ug/l
Diethylphthalate*	1 J ug/l
Di-n-butylphthalate*	110 J ug/kg
Butylbenzylphthalate*	1 J ug/l
Bis(2-Ethylhexyl)phthalate*	8 J ug/l

* = Common laboratory contaminants

- The initial semivolatile extract of the soil sample CKW92 was lost during extraction due to glassware breakage. The sample was reextracted outside the extraction holding time and analyzed. See case narrative in Appendix F.

- Sample CKW92 was incorrectly listed on the Traffic Report (TR) as CJW92. The TR was corrected by the reviewer. See corresponding letters in Appendix F.

- In the volatile analyses, IS3 had a response outside the QC limits for sample CKW92MSD. No action was taken.

- In the volatile analyses, samples CJW01RE and CJW19MS had one (1) system monitoring compound outside the QC limits. No action was taken.

- In the semivolatile analyses, IS5 and IS6 had responses outside the QC limits in the MSD analyses of sample CJW05. No action was taken.

- In the pesticide/PCB analyses, the laboratory method blanks PBLKPA, PBLKPC and PBLKPB had two (2) to three (3) surrogate recoveries outside the lower QC limits for tetrachloro-m-xylene (TCX) and/or decachlorobiphenyl (DCB) on both columns, indicating a poor extraction technique within the laboratory.

- In the pesticide/PCB analyses, surrogates DCB and/or TCX had recoveries outside the lower QC limits in the MS/MSD analyses of samples CKW18, CKW20 and CKW92. No action was taken.

- In the pesticide/PCB analyses, the surrogate compound DCB had recovery outside the lower QC limits in sample CJW08 on one (1) column. No action was taken.

- The semivolatile extraction of several soil samples were performed eight (8) to nine (9) days after the date of sample collection. Although no technical holding time for the extraction of semivolatiles in soil samples has been established, the technical holding time of seven (7) days for aqueous samples has been exceeded by one (1) or two (2) days. Since the semivolatile compounds are persistent and stable in the soil matrix, no action was taken.

- Non-spiked compounds, other than blank contaminants, were detected in the MS and/or the MSD analyses of samples CJW19 and CKW92. The results and precision estimates are as follow:

Compound	Concentrations (ug/l) CJW19	MS	MSD	%RSD
Acenaphthalyne	ND	0.3 J	0.2 J	40*

Compound	Concentrations (ug/kg) CKW92	MS	MSD	%RSD
2-Methylnaphthalene	ND	26 J	ND	IN
Phenanthrene	ND	33 J	ND	IN

% RSD = Percent Relative Standard Deviation
ND = Nondetect
IN = Indeterminable

- Two (2) field duplicate pairs (CJW09/CJW14) and (CJW21/CJW27) were analyzed. No target compounds except for blank contaminants were detected in CJW09/CJW14. The results and precision estimates for the second pair excluding the blank contaminants, are listed below:

Compound	Concentration (ug/kg) CJW09	CJW14	RPD
2-Methylnaphthalene	48 J	24 J	67
Phenanthrene	120 J	140 J	15
Fluoranthene	120 J	130 J	8
Pyrene	190 J	240 J	23

Compound	Concentration (ug/kg) CJW09	CJW14	RPD
Benzo(a)anthracene	72 J	78 J	12
Chrysene	100 J	96 J	4
Benzo)b)fluoranthene	120 J	130 J	8
Benzo(K)fluoranthene	44 J	ND	IN
Benzo(a)pyrene	80 J	84 J	5
Aldrin	3.5 J	5.2 J	39

RPD = Relative percent difference
ND = Nondetect
IN = Indeterminable

- In the semivolatile and pesticide/PCB analyses of the soil samples, GPC cleanup was performed. The dilution factor of two (2) required by this procedure was accounted for in the analytical procedure by used laboratory.

- The tentatively identified compounds (TICs) in Appendix C were reviewed and corrected during data validation. Compounds identified as blank contaminants, or aldol condensation products, were crossed off the TIC Form Is.

All data for case 21162 were reviewed in accordance with the National Functional Guidelines for evaluating organic analyses with modification for use within region III. The text of the report addresses only those problems affecting usability.

ATTACHMENTS

1) Appendix A- Glossary of data qualifiers
2) Appendix B- Data summary. These include:
   (a) All positive results for target compounds with qualifiers code when applicable
   (b) All unusable detection limits (qualified "R")
3) Appendix C- Results as reported by the laboratory for all target compounds
4) Appendix D- Reviewed and corrected tentatively identified compounds
5) Appendix E- Organic Regional Data Assessment Summary
6) Appendix F- Support documentation

DCN:MH4003A58.HOF

ORIGINAL (Red)

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

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

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

NO CODE = Confirmed identification.

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

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

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

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

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

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

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

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

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix A

Glossary of Data Qualifiers

Appendix B

Data Summary Forms

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limits:
(CRDL * Dilution Factor)

	Sample No.	CJW15	CJW16	CJW18	CJW19	CJW20	CJW21	CJW22	CJW23	CJW24
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Location	RW-1	RW-2	RW-4	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
							SAMPLE IS A FIELD DUP. OF CJW27			
CRQL	COMPOUND									
10	Chloromethane									
10	Bromomethane									
10	*Vinyl Chloride									
10	Chloroethane									
10	*Methylene Chloride	3 B	2 B	2 B	2 B	1 B	1 B	1 B	2 B	2 B
10	Acetone	7 B			5 B					5 B
10	Carbon Disulfide									
10	*1,1-Dichloroethene									
10	1,1-Dichloroethane									
10	*Total 1,2-Dichloroethene									
10	Chloroform	35								
10	*1,2-Dichloroethane									
10	*2-Butanone									
10	*1,1,1-Trichloroethane									
10	*Carbon Tetrachloride									
10	Bromodichloromethane									

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 07/90

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limi
(CRDL * Dilution Fac

	Sample No.	CJW15	CJW16	CJW18	CJW19	CJW20	CJW21	CJW22	CJW23	CJW24
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Location	RW-1	RW-2	RW-4	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
							SAMPLE IS A FIELD DUP. OF CJW27			
CRQL	COMPOUND									
10	*1,2-Dichloropropane									
10	Cis-1,3-Dichloropropene									
10	Trichloroethene									
10	Dibromochloromethane									
10	1,1,2-Trichloroethane									
10	*Benzene									
10	Trans-1,3-Dichloropropene									
10	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
10	*Tetrachloroethene									
10	1,1,2,2-Tetrachloroethane									
10	*Toluene									
10	*Chlorobenzene									
10	*Ethylbenzene									
10	*Styrene									
10	*Total Xylenes									

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINIT

revised (

DATA SUMMARY FORM: V O L A T I L E S 1

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limit
(CRQL * Dilution Facto

	Sample No.	CJW25		CJW26		CJW27		CJW28		CJW29							
	Dilution Factor	1.0		1.0		1.0		1.0		1.0							
	Location	SW-7		SW-8		SW-9		BLK-1		TB-1							
CRQL	COMPOUND					SAMPLE IS A FIELD DUP. OF CJW21		SAMPLE IS A FIELD BLANK.		SAMPLE IS A TRIP BLANK.							
10	Chloromethane																
10	Bromomethane																
10	*Vinyl Chloride																
10	Chloroethane																
10	*Methylene Chloride	1	B	2	B	2	B	2	B								
10	Acetone							7	B	11	B						
10	Carbon Disulfide																
10	*1,1-Dichloroethene																
10	1,1-Dichloroethane																
10	*Total 1,2-Dichloroethene																
10	Chloroform							1	J								
10	*1,2-Dichloroethane							2	J								
10	*2-Butanone																
10	*1,1,1-Trichloroethane																
10	*Carbon Tetrachloride																
10	Bromodichloromethane																

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITION

revised 07/9

DATA SUMMARY FORM: V O L A T I L E S 2

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation lim
(CRDL * Dilution Fac

	Sample No.	CJW25	CJW26	CJW27	CJW28	CJW29				
	Dilution Factor	1.0	1.0	1.0	1.0	1.0				
	Location	SW-7	SW-8	SW-9	BLK-1	TB-1				
				SAMPLE IS A FIELD DUP. OF CJW21	SAMPLE IS A FIELD BLANK.	SAMPLE IS A TRIP BLANK.				
CRQL	COMPOUND									
10	*1,2-Dichloropropane									
10	Cis-1,3-Dichloropropene									
10	Trichloroethene									
10	Dibromochloromethane									
10	1,1,2-Trichloroethane									
10	*Benzene									
10	Trans-1,3-Dichloropropene									
10	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
10	*Tetrachloroethene									
10	1,1,2,2-Tetrachloroethane				2 J					
10	*Toluene				1 J					
10	*Chlorobenzene				1 J					
10	*Ethylbenzene									
10	*Styrene									
10	*Total Xylenes				2 J					

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINI

revised

ORIGINAL (Red) TERRIGNO

DATA SUMMARY FORM: V O L A T I L E S 1

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limit
(CRQL * Dilution factor / ((100 - %moisture)/10

		Sample No.	CJW01		CJW02RE		CJW03		CJW04		CJW05		CJW06		CJW07		CJW08		CJW09RE	
		Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
		% Moisture	15		17		20		12		2		37		26		24		23	
		Location	SOURCE-1		SOURCE-2		SOURCE-3		SOURCE-4		SOURCE-5		SED-1		SED-2		SED-3		SED-4	
																			SAMPLE IS A FIELD DUP. O CJW14	
CRQL		COMPOUND																		
10		Chloromethane		UJ		UJ		UJ		UJ		UJ								
10		Bromomethane																		
10		Vinyl Chloride																		
10		Chloroethane																		
10		Methylene Chloride	7	B	14	B	7	B	11	B	5	B	10	B	10	B	3	B	5	B
10		Acetone		UJ		UJ	63	B		UJ		UJ	120	B		UJ		UJ		U
10		Carbon Disulfide					5	J												
10		1,1-Dichloroethene																		
10		1,1-Dichloroethane																		
10		Total 1,2-Dichloroethene																		
10		Chloroform																		
10		1,2-Dichloroethane																		
10		2-Butanone					16	J												
10		1,1,1-Trichloroethane				UJ														
10		Carbon Tetrachloride				UJ														
10		Bromodichloromethane				UJ														

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITION

revised 07/9

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation li
(CRQL * Dilution factor / ((100 - %moisture)

	Sample No.	CJW01		CJW02RE		CJW03		CJW04		CJW05		CJW06		CJW07		CJW08		CJW09RE
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0
	% Moisture	15		17		20		12		2		37		26		24		23
	Location	SOURCE-1		SOURCE-2		SOURCE-3		SOURCE-4		SOURCE-5		SED-1		SED-2		SED-3		SED-4
																		SAMPLE IS FIELD DUP CJW14
CRQL	COMPOUND																	
10	1,2-Dichloropropane				UJ													
10	Cis-1,3-Dichloropropene				UJ													
10	Trichloroethene				UJ													
10	Dibromochloromethane				UJ													
10	1,1,2-Trichloroethane				UJ													
10	Benzene				UJ													
10	Trans-1,3-Dichloropropene				UJ													
10	Bromoform				UJ													
10	4-Methyl-2-pentanone		UJ		UJ				UJ									
10	2-Hexanone		UJ		UJ				UJ									
10	Tetrachloroethene		UJ		UJ				UJ									
10	1,1,2,2-Tetrachloroethane		UJ		UJ				UJ									
10	Toluene		UJ	2+	B	4	B	4	B									
10	Chlorobenzene		UJ		UJ				UJ									
10	Ethylbenzene		UJ		UJ	26			UJ									
10	Styrene		UJ		UJ				UJ									
10	Total Xylenes		UJ		UJ	50		7	B									

CRQL = Contract Required Quantitation Limit
+ = Result taken from initial analysis

SEE NARRATIVE FOR CODE DEFIN
revised

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limit
(CRQL * Dilution factor / ((100 - %moisture)/10

	Sample No.	CJW10		CJW11		CJW12		CJW13		CJW14		CKW92					
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0					
	% Moisture	42		19		26		45		26		15					
	Location	SED-5		SED-6		SED-7		SED-8		SED-9		SOURCE-6					
										SAMPLE IS A FIELD DUP. OF CJW09							
CRQL	COMPOUND																
10	Chloromethane				UJ						UJ		UJ				
10	Bromomethane																
10	Vinyl Chloride																
10	Chloroethane																
10	Methylene Chloride	5	B	4	B	4	B	6	B	3	B	4	B				
10	Acetone	32	B		UJ		UJ		UJ	29	B	5	B				
10	Carbon Disulfide																
10	1,1-Dichloroethene																
10	1,1-Dichloroethane																
10	Total 1,2-Dichloroethene																
10	Chloroform																
10	1,2-Dichloroethane																
10	2-Butanone																
10	1,1,1-Trichloroethane																
10	Carbon Tetrachloride																
10	Bromodichloromethane																

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIO

revised 07/

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation lim
(CRQL * Dilution factor / ((100 - %moisture)/

	Sample No.	CJW10	CJW11	CJW12	CJW13	CJW14	CKW92			
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0			
	% Moisture	42	19	26	45	26	15			
	Location	SED-5	SED-6	SED-7	SED-8	SED-9	SOURCE-6			
						SAMPLE IS A FIELD DUP. OF CJW09				
CRQL	COMPOUND									
10	1,2-Dichloropropane									
10	Cis-1,3-Dichloropropene									
10	Trichloroethene									
10	Dibromochloromethane									
10	1,1,2-Trichloroethane									
10	Benzene									
10	Trans-1,3-Dichloropropene									
10	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
10	Tetrachloroethene									
10	1,1,2,2-Tetrachloroethane									
10	Toluene									
10	Chlorobenzene									
10	Ethylbenzene									
10	Styrene									
10	Total Xylenes									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINIT

revised 0

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limi
(CRDL * Dilution Fact

	Sample No.	CJW15	CJW16	CJW18	CJW19	CJW20	CJW21	CJW22	CJW23	CJW24
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Location	RW-1	RW-2	RW-4	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
							SAMPLE IS A FIELD DUP. OF CJW27			
CRQL	COMPOUND									
10	Phenol									
10	bis(2-Chloroethyl)ether									
10	2-Chlorophenol									
10	*1,3-Dichlorobenzene									
10	*1,4-Dichlorobenzene									
10	1,2-Dichlorobenzene									
10	2-Methylphenol									
10	2,2'-oxybis(1-chloropropane)									
10	4-Methylphenol									
10	N-Nitroso-di-n-propylamine									
10	Hexachloroethane									
10	Nitrobenzene									
10	Isophorone									
10	2-Nitrophenol									
10	2,4-Dimethylphenol									
10	bis(2-Chloroethoxy)methane									
10	2,4-Dichlorophenol									
10	1,2,4-Trichlorobenzene									
10	Naphthalene									
10	4-Chloroaniline									

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITI

revised 07

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation lim
(CRDL * Dilution Fac

	Sample No.	CJW15		CJW16		CJW18		CJW19		CJW20		CJW21		CJW22		CJW23		CJW24	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	Location	RW-1		RW-2		RW-4		SW-1		SW-2		SW-3		SW-4		SW-5		SW-6	
												SAMPLE IS A FIELD DUP. OF CJW27							
CRQL	COMPOUND																		
10	Hexachlorobutadiene																		
10	4-Chloro-3-methylphenol																		
10	2-Methylnaphthalene																		
10	Hexachlorocyclopentadiene																		
10	2,4,6-Trichlorophenol																		
25	2,4,5-Trichlorophenol																		
10	2-Chloronapthalene																		
25	2-Nitroaniline																		
10	Dimethylphthalate																		
10	Acenaphthylene																		
10	2,6-Dinitrotoluene																		
25	3-Nitroaniline																		
10	Acenaphthene																		
25	2,4-Dinitrophenol		R		R		R		R		R		R		R		R		
25	4-Nitrophenol																		
10	Dibenzofuran																		
10	2,4-Dinitrotoluene																		
10	Diethylphthalate									0.7	B	0.5	B						
10	4-Chlorophenyl-phenylether																		
10	Fluorene																		
25	4-Nitroaniline																		
25	4,6-Dinitro-2-methylphenol		UJ		UJ		UJ		R		R		UJ		UJ		UJ		

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINIT

revised 0

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limi
(CRDL * Dilution Fact

CRQL	COMPOUND	CJW15		CJW16		CJW18		CJW19		CJW20		CJW21		CJW22		CJW23		CJW24	
	Sample No.	CJW15		CJW16		CJW18		CJW19		CJW20		CJW21		CJW22		CJW23		CJW24	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	Location	RW-1		RW-2		RW-4		SW-1		SW-2		SW-3		SW-4		SW-5		SW-6	
												SAMPLE IS A FIELD DUP. OF CJW27							
10	N-Nitrosodiphenylamine																		
10	4-Bromophenyl-phenylether																		
10	*Hexachlorobenzene																		
25	*Pentachlorophenol																		
10	Phenanthrene																		
10	Anthracene																		
10	Carbazole																		
10	Di-n-butylphthalate													0.5	B				
10	Fluoranthene																		
10	Pyrene																		
10	Butylbenzylphthalate																		
10	3,3'-Dichlorobenzidine																		
10	Benzo(a)anthracene																		
10	Chrysene																		
10	bis(2-Ethylhexyl)phthalate	1	B	0.5	B	1	B	2	B	1	B	1	B	2	B	1	B	12	
10	Di-n-octylphthalate																		
10	Benzo(b)fluoranthene																		
10	Benzo(k)fluoranthene																		
10	Benzo(a)pyrene																		
10	Indeno(1,2,3-cd)pyrene																		
10	Dibenz(a,h)anthracene																		
10	Benzo(g,h,i)perylene																		

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITI

revised 07

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation lim
(CRDL * Dilution Fa

	Sample No.	CJW25	CJW26	CJW27	CJW28					
	Dilution Factor	1.0	1.0	1.0	1.0					
	Location	SW-7	SW-8	SW-9	BLK-1					
				SAMPLE IS A FIELD DUP. OF CJW21	SAMPLE IS A FIELD BLANK.					
CRQL	COMPOUND									
10	Phenol									
10	bis(2-Chloroethyl)ether									
10	2-Chlorophenol									
10	*1,3-Dichlorobenzene									
10	*1,4-Dichlorobenzene									
10	1,2-Dichlorobenzene									
10	2-Methylphenol									
10	2,2'-oxybis(1-chloropropane)									
10	4-Methylphenol									
10	N-Nitroso-di-n-propylamine									
10	Hexachloroethane									
10	Nitrobenzene									
10	Isophorone									
10	2-Nitrophenol									
10	2,4-Dimethylphenol									
10	bis(2-Chloroethoxy)methane									
10	2,4-Dichlorophenol									
10	1,2,4-Trichlorobenzene									
10	Naphthalene									
10	4-Chloroaniline									

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINI

revised (

DATA SUMMARY FORM: B N A 2

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limit
(CRDL * Dilution Facto

	Sample No.	CJW25	CJW26	CJW27	CJW28					
	Dilution Factor	1.0	1.0	1.0	1.0					
	Location	SW-7	SW-8	SW-9	BLK-1					
				SAMPLE IS A FIELD DUP. OF CJW21	SAMPLE IS A FIELD BLANK.					
CRQL	COMPOUND									
10	Hexachlorobutadiene									
10	4-Chloro-3-methylphenol									
10	2-Methylnaphthalene									
10	Hexachlorocyclopentadiene									
10	2,4,6-Trichlorophenol									
25	2,4,5-Trichlorophenol									
10	2-Chloronapthalene									
25	2-Nitroaniline									
10	Dimethylphthalate									
10	Acenaphthylene									
10	2,6-Dinitrotoluene									
25	3-Nitroaniline									
10	Acenaphthene									
25	2,4-Dinitrophenol		R		R		R		R	
25	4-Nitrophenol									
10	Dibenzofuran									
10	2,4-Dinitrotoluene									
10	Diethylphthalate					1	J			
10	4-Chlorophenyl-phenylether									
10	Fluorene									
25	4-Nitroaniline									
25	4,6-Dinitro-2-methylphenol		UJ		UJ		UJ		UJ	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIO

revised 07/

ORIGINAL (Red)

DATA SUMMARY FORM: B N A 3

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limi
(CRDL * Dilution Fact

	Sample No.	CJW25	CJW26	CJW27	CJW28					
	Dilution Factor	1.0	1.0	1.0	1.0					
	Location	SW-7	SW-8	SW-9	BLK-1					
				SAMPLE IS A FIELD DUP. OF CJW21	SAMPLE IS A FIELD BLANK.					
CRQL	COMPOUND									
10	N-Nitrosodiphenylamine									
10	4-Bromophenyl-phenylether									
10	*Hexachlorobenzene									
25	*Pentachlorophenol									
10	Phenanthrene									
10	Anthracene									
10	Carbazole									
10	Di-n-butylphthalate				0.8 B					
10	Fluoranthene									
10	Pyrene									
10	Butylbenzylphthalate				1 J					
10	3,3'-Dichlorobenzidine									
10	Benzo(a)anthracene									
10	Chrysene									
10	bis(2-Ethylhexyl)phthalate	0.5 B		0.8 B						
10	Di-n-octylphthalate									
10	Benzo(b)fluoranthene									
10	Benzo(k)fluoranthene									
10	Benzo(a)pyrene									
10	Indeno(1,2,3-cd)pyrene									
10	Dibenz(a,h)anthracene									
10	Benzo(g,h,i)perylene									

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINIT

revised 0

DATA SUMMARY FORM: B N A

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limits
(CRQL * Dilution factor / ((100 - %moisture)/10

	Sample No.	CJW01	CJW02	CJW03	CJW04	CJW05	CJW06	CJW07	CJW08RE	CJW09
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	% Moisture	15	17	20	12	2	37	26	24	23
	Location	SOURCE-1	SOURCE-2	SOURCE-3	SOURCE-3	SOURCE-5	SED-1	SED-2	SED-3	SED-4
										SAMPLE IS A FIELD DUP. OF CJW14
CRQL	COMPOUND									
330	Phenol									
330	bis(2-Chloroethyl)ether									
330	2-Chlorophenol									
330	1,3-Dichlorobenzene									
330	1,4-Dichlorobenzene									
330	1,2-Dichlorobenzene									
330	2-Methylphenol									
330	2,2'-oxybis(1-chloropropane)									
330	4-Methylphenol									
330	N-Nitroso-di-n-propylamine									
330	Hexachloroethane									
330	Nitrobenzene									
330	Isophorone									
330	2-Nitrophenol									
330	2,4-Dimethylphenol									
330	bis(2-Chloroethoxy)methane									
330	2,4-Dichlorophenol									
330	1,2,4-Trichlorobenzene									
330	Naphthalene				27 J				27 J	
330	4-Chloroaniline									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIO

revised 07/

ORIGINAL (Red)

DATA SUMMARY FORM: B N A 2

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limits:
(CRQL * Dilution factor / ((100 - %moisture)/100

	Sample No.	CJW01	CJW02	CJW03	CJW04	CJW05	CJW06	CJW07	CJW08RE	CJW09
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	% Moisture	15	17	20	12	2	37	26	24	23
	Location	SOURCE-1	SOURCE-2	SOURCE-3	SOURCE-3	SOURCE-5	SED-1	SED-2	SED-3	SED-4 SAMPLE IS A FIELD DUP. OF CJW14
CRQL	COMPOUND									
330	Hexachlorobutadiene									
330	4-Chloro-3-methylphenol									
330	2-Methylnaphthalene				74 J				74 J	48 J
330	Hexachlorocyclopentadiene									
330	2,4,6-Trichlorophenol									
800	2,4,5-Trichlorophenol									
330	2-Chloronapthalene									
800	2-Nitroaniline									
330	Dimethylphthalate									
330	Acenaphthylene									
330	2,6-Dinitrotoluene									
800	3-Nitroaniline									
330	Acenaphthene									
800	2,4-Dinitrophenol	R	R	R	R	R	R	R	UJ	R
800	4-Nitrophenol									
330	Dibenzofuran									
330	2,4-Dinitrotoluene									
330	Diethylphthalate									
330	4-Chlorophenyl-phenylether									
330	Fluorene				96 J					
800	4-Nitroaniline									
800	4,6-Dinitro-2-methylphenol	R	R	R		UJ	UJ	UJ	UJ	UJ

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIO

revised 07/

DATA SUMMARY FORM: B N A 3

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limit
(CRQL * Dilution factor / ((100 - %moisture)/10

	Sample No.	CJW01		CJW02		CJW03		CJW04		CJW05		CJW06		CJW07		CJW08RE		CJW09	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	15		17		20		12		2		37		26		24		23	
	Location	SOURCE-1		SOURCE-2		SOURCE-3		SOURCE-3		SOURCE-5		SED-1		SED-2		SED-3		SED-4 SAMPLE IS A FIELD DUP. OF CJW14	
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine							32	J										
330	4-Bromophenyl-phenylether																		
330	Hexachlorobenzene																		
800	Pentachlorophenol																		
330	Phenanthrene	45	J	53	J			430						40	J	140	J	120	J
330	Anthracene																		
330	Carbazole							45	J										
330	Di-n-butylphthalate	73	B	30	B	36	B	68	B	150	B	87	B	37	B	61	B	120	B
330	Fluoranthene							240	J					30	J	93	J	120	J
330	Pyrene							200	J					31	J	230	J	190	J
330	Butylbenzylphthalate															41	J		
330	3,3'-Dichlorobenzidine																		
330	Benzo(a)anthracene							47	J					17	J	58	J	72	J
330	Chrysene							93	J					34	J	90	J	100	J
330	bis(2-Ethylhexyl)phthalate			370	B	530	B	290	B	77	B	30	B	24	B	260	B	72	B
330	Di-n-octylphthalate											33	J			35	J		UJ
330	Benzo(b)fluoranthene							41	J			30	J	29	J	100	J	120	J
330	Benzo(k)fluoranthene																UJ	44	J
330	Benzo(a)pyrene							38	J							100	J	80	J
330	Indeno(1,2,3-cd)pyrene																UJ		UJ
330	Dibenz(a,h)anthracene																UJ		UJ
330	Benzo(g,h,i)perylene																UJ		

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITION

revised 07/9

ORIGINAL (Red)

DATA SUMMARY FORM: B N A 1

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limi
(CRQL * Dilution factor / ((100 - %moisture)/1

	Sample No.	CJW10	CJW11	CJW12	CJW13	CJW14	CKW92RE			
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0			
	% Moisture	42	19	26	45	26	15			
	Location	SED-5	SED-6	SED-7	SED-8	SED-9	SOURCE-6			
						SAMPLE IS A FIELD DUP. OF CJW09				
CRQL	COMPOUND									
330	Phenol						UJ			
330	bis(2-Chloroethyl)ether						UJ			
330	2-Chlorophenol						UJ			
330	1,3-Dichlorobenzene						UJ			
330	1,4-Dichlorobenzene						UJ			
330	1,2-Dichlorobenzene						UJ			
330	2-Methylphenol						UJ			
330	2,2'-oxybis(1-chloropropane)						UJ			
330	4-Methylphenol						UJ			
330	N-Nitroso-di-n-propylamine						UJ			
330	Hexachloroethane						UJ			
330	Nitrobenzene						UJ			
330	Isophorone						UJ			
330	2-Nitrophenol						UJ			
330	2,4-Dimethylphenol						UJ			
330	bis(2-Chloroethoxy)methane						UJ			
330	2,4-Dichlorophenol						UJ			
330	1,2,4-Trichlorobenzene						UJ			
330	Naphthalene						UJ			
330	4-Chloroaniline						UJ			

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITI

revised 07

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limits:
(CRQL * Dilution factor / ((100 - %moisture)/100)

	Sample No.	CJW10	CJW11	CJW12	CJW13	CJW14	CKW92RE			
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0			
	% Moisture	42	19	26	45	26	15			
	Location	SED-5	SED-6	SED-7	SED-8	SED-9	SOURCE-6			
						SAMPLE IS A FIELD DUP. OF CJW09				
CRQL	COMPOUND									
330	Hexachlorobutadiene						UJ			
330	4-Chloro-3-methylphenol						UJ			
330	2-Methylnaphthalene	43 J	21 J	29 J		51 J	UJ			
330	Hexachlorocyclopentadiene						UJ			
330	2,4,6-Trichlorophenol						UJ			
800	2,4,5-Trichlorophenol						UJ			
330	2-Chloronapthalene						UJ			
800	2-Nitroaniline						UJ			
330	Dimethylphthalate					24 J	UJ			
330	Acenaphthylene						UJ			
330	2,6-Dinitrotoluene						UJ			
800	3-Nitroaniline						UJ			
330	Acenaphthene						UJ			
800	2,4-Dinitrophenol	R	R	R	R	R	R			
800	4-Nitrophenol						UJ			
330	Dibenzofuran						UJ			
330	2,4-Dinitrotoluene						UJ			
330	Diethylphthalate						UJ			
330	4-Chlorophenyl-phenylether						UJ			
330	Fluorene						UJ			
800	4-Nitroaniline						UJ			
800	4,6-Dinitro-2-methylphenol	UJ	UJ	UJ	UJ	UJ	UJ			

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 07/90

DATA SUMMARY FORM: B N A 3

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limit
(CRQL * Dilution factor / ((100 - %moisture)/10

	Sample No.	CJW10		CJW11		CJW12		CJW13		CJW14		CKW92RE							
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0							
	% Moisture	42		19		26		45		26		15							
	Location	SED-5		SED-6		SED-7		SED-8		SED-9		SOURCE-6							
										SAMPLE IS A FIELD DUP. OF CJW09									
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine												UJ						
330	4-Bromophenyl-phenylether												UJ						
330	Hexachlorobenzene												UJ						
800	Pentachlorophenol												UJ						
330	Phenanthrene	60	J	51	J	45	J	63	J	140	J		UJ						
330	Anthracene												UJ						
330	Carbazole												UJ						
330	Di-n-butylphthalate	340	B	200	B	110	B	320	B	190	B	120	B						
330	Fluoranthene	58	J	58	J	57	J	78	J	130	J		UJ						
330	Pyrene	63	J	59	J	60	J	89	J	240	J		UJ						
330	Butylbenzylphthalate							68	B	27	B		UJ						
330	3,3'-Dichlorobenzidine												UJ						
330	Benzo(a)anthracene	30	J	26	J	24	J	40	J	78	J		UJ						
330	Chrysene	45	J	39	J	39	J	58	J	96	J		UJ						
330	bis(2-Ethylhexyl)phthalate	60	B	85	B	56	B	75	B	98	B	390	B						
330	Di-n-octylphthalate									46	J		UJ						
330	Benzo(b)fluoranthene	90	J	47	J	46	J	71	J	130	J		UJ						
330	Benzo(k)fluoranthene										UJ		UJ						
330	Benzo(a)pyrene	64	J	26	J			43	J	84	J		UJ						
330	Indeno(1,2,3-cd)pyrene	64	J								UJ		UJ						
330	Dibenz(a,h)anthracene										UJ		UJ						
330	Benzo(g,h,i)perylene										UJ		UJ						

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIC

revised 07,

D[illegible]UMMARY FORM: P E S T I C I D E S [illegible] P C B S

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limit
(CRDL * Dilution Facto

CRQL	COMPOUND	CJW15	CJW16	CJW18	CJW19	CJW20	CJW21	CJW22	CJW23	CJW24
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Location	RW-1	RW-2	RW-4	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
							SAMPLE IS A FIELD DUP. OF CJW27			
0.05	alpha-BHC			UJ						
0.05	beta-BHC			UJ						
0.05	delta-BHC			UJ						
0.05	*gamma-BHC (Lindane)			UJ						
0.05	*Heptachlor			UJ						
0.05	Aldrin			UJ						
0.05	Heptachlor Epoxide			UJ						
0.05	Endosulfan I			UJ						
0.10	Dieldrin			UJ						
0.10	4,4'-DDE			UJ						
0.10	*Endrin			UJ						
0.10	Endosulfan II			UJ						
0.10	4,4'-DDD			UJ						
0.10	Endosulfan Sulfate			UJ						
0.10	4,4'-DDT			UJ						0.11
0.50	*Methoxychlor			UJ						
0.10	Endrin Ketone			UJ						
0.10	Endrin Aldehyde			UJ						
0.05	*alpha-Chlordane			UJ						
0.05	*gamma-Chlordane			UJ						
5.0	*Toxaphene			UJ						
1.0	*Aroclor-1016			UJ						
2.0	*Aroclor-1221			UJ						
1.0	*Aroclor-1232			UJ						
1.0	*Aroclor-1242			UJ						
1.0	*Aroclor-1248			UJ						
1.0	*Aroclor-1254			UJ						
1.0	*Aroclor-1260			UJ						

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIO

revised 07/

ORIGINAL (Red)

DATA SUMMARY FORM: P E S T I C I D E S A N D P C B S

Site Name: HOFFMAN LF

WATER SAMPLES
(ug/L)

To calculate sample quantitation limits
(CRQL * Dilution Factor

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

	Sample No.	CJW25	CJW26	CJW27	CJW28					
	Dilution Factor	1.0	1.0	1.0	1.0					
	Location	SW-7	SW-8	SW-9	BLK-1					
				SAMPLE IS A FIELD DUP. OF CJW21	SAMPLE IS A FIELD BLANK.					
CRQL	COMPOUND									
0.05	alpha-BHC									
0.05	beta-BHC									
0.05	delta-BHC									
0.05	*gamma-BHC (Lindane)									
0.05	*Heptachlor									
0.05	Aldrin									
0.05	Heptachlor Epoxide									
0.05	Endosulfan I									
0.10	Dieldrin									
0.10	4,4'-DDE									
0.10	*Endrin									
0.10	Endosulfan II									
0.10	4,4'-DDD									
0.10	Endosulfan Sulfate									
0.10	4,4'-DDT									
0.50	*Methoxychlor									
0.10	Endrin Ketone									
0.10	Endrin Aldehyde									
0.05	*alpha-Chlordane									
0.05	*gamma-Chlordane									
5.0	*Toxaphene									
1.0	*Aroclor-1016									
2.0	*Aroclor-1221									
1.0	*Aroclor-1232									
1.0	*Aroclor-1242									
1.0	*Aroclor-1248									
1.0	*Aroclor-1254									
1.0	*Aroclor-1260									

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIC

revised 07/

DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limits:
(CRQL * Dilution factor / ((100 - %moisture)/100)

	Sample No.	CJW01	CJW02	CJW03	CJW04	CJW05	CJW06	CJW07	CJW08	CJW09
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	% Moisture	15	17	20	12	2	37	26	24	23
	Location	SOURCE-1	SOURCE-2	SOURCE-3	SOURCE-4	SOURCE-5	SED-1	SED-2	SED-3	SED-4
										SAMPLE IS A FIELD DUP. OF CJW14
CRQL	COMPOUND									
1.7	alpha-BHC									
1.7	beta-BHC									
1.7	delta-BHC									
1.7	gamma-BHC (Lindane)									
1.7	Heptachlor									
1.7	Aldrin	4.3 J	2.2 J	3.4 J	3.0 J				3.5 J	3.5 J
1.7	Heptachlor Epoxide			2.2 J						
1.7	Endosulfan I									
3.3	Dieldrin			14 J						
3.3	4,4'-DDE									
3.3	Endrin									
3.3	Endosulfan II									
3.3	4,4'-DDD									
3.3	Endosulfan Sulfate									
3.3	4,4'-DDT									
17	Methoxychlor									
3.3	Endrin Ketone									
3.3	Endrin Aldehyde									
1.7	alpha-Chlordane									
1.7	gamma-Chlordane									
170	Toxaphene									
33	Aroclor-1016									
67	Aroclor-1221									
33	Aroclor-1232									
33	Aroclor-1242				63 J					
33	Aroclor-1248									
33	Aroclor-1254									
33	Aroclor-1260									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITION

revised 07/9

ORIGINAL (Red)

DATA SUMMARY FORM: P E S T I C I D E S A N D P C B S

Site Name: HOFFMAN LF

SOIL SAMPLES
(ug/Kg)

Case #: 21162 Sampling Date(s): 11-2-93 - 11-3-93

To calculate sample quantitation limits:
(CRQL * Dilution factor / ((100 - %moisture)/100)

		Sample No.	CJW10		CJW11		CJW12		CJW13		CJW14		CKW92						
		Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0						
		% Moisture	42		19		26		45		26		15						
		Location	SED-5		SED-6		SED-7		SED-8		SED-9		SOURCE-6						
											SAMPLE IS A FIELD DUP. OF CJW09								
CRQL	COMPOUND																		
1.7	alpha-BHC							UL		UJ									
1.7	beta-BHC							UL		UJ									
1.7	delta-BHC							UL		UJ									
1.7	gamma-BHC (Lindane)							UL		UJ									
1.7	Heptachlor							UL		UJ									
1.7	Aldrin							UL		UJ	5.2	J							
1.7	Heptachlor Epoxide							UL		UJ									
1.7	Endosulfan I							UL		UJ									
3.3	Dieldrin							UL		UJ									
3.3	4,4'-DDE							UL		UJ									
3.3	Endrin							UL		UJ									
3.3	Endosulfan II							UL		UJ									
3.3	4,4'-DDD							UL		UJ									
3.3	Endosulfan Sulfate							UL		UJ									
3.3	4,4'-DDT							UL		UJ									
17	Methoxychlor							UL		UJ									
3.3	Endrin Ketone							UL		UJ									
3.3	Endrin Aldehyde							UL		UJ									
1.7	alpha-Chlordane							UL		UJ									
1.7	gamma-Chlordane							UL		UJ									
170	Toxaphene							UL		UJ									
33	Aroclor-1016							UL		UJ									
67	Aroclor-1221							UL		UJ									
33	Aroclor-1232							UL		UJ									
33	Aroclor-1242							UL		UJ									
33	Aroclor-1248							UL		UJ									
33	Aroclor-1254							UL		UJ									
33	Aroclor-1260							UL		UJ									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIO

revised 07/

ORIGINAL
(Red)

ATTACHMENT II

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III
CENTRAL REGIONAL LABORATORY
201 DEFENSE HIGHWAY
SUITE 200
ANNAPOLIS, MARYLAND 21401

QUALITY
ASSURANCE
BRANCH

ORIGINAL (Red)

DATE : February 15, 1994

SUBJECT: Region III Data QA Review

FROM : Cynthia E. Caporale C. Caporale
Region III ESAT RPO (3ES30)

TO : Michele Mosco
State of Maryland

Attached is the inorganic data validation report for the Hoffman Landfill Site (Case 21162) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III ESD.

If you have any questions regarding this review, please call me at (410) 573-6832.

Attachment

cc: Mike Taurino, RPM, w/o attachment (3HW73)
Regional CLP TPO: Stevie Wilding Region: III Lab Code: ETS

TID File: 03931334

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Lockheed
Environmental Systems & Technologies Co.
Environmental Services Assistance Teams
Region 3
1419 Forest Drive, Suite 104
Annapolis, Maryland 21403

Phone: (410) 268-7705
Fax: (410) 268-8472

ORIGINAL (Red)

DATE: February 8, 1994

SUBJECT: Inorganic Data Validation for Case 21162
Site: Hoffman Landfill

FROM: Siroos Mostaghimi SM — Inorganic Data Reviewer
Mahboobeh Mecanic — Senior Oversight Chemist

TO: Cynthia E. Caporale
ESAT Regional Project Officer

THROUGH: Dale S. Boshart DSB
ESAT Team Manager

OVERVIEW

The set of samples for Case 21162 was analyzed by ETS Analytical Services (ETS) for total metals and cyanide (CN) according to the Contract Laboratory Program (CLP) Routine Analytical Services (RAS) Statement of Work (SOW) ILM02.0. The sample set consisted of thirteen (13) aqueous and fifteen (15) soil samples. Included in the case were one (1) field duplicate pair for each matrix and one (1) aqueous field blank.

SUMMARY

All analytes except lead (Pb) in SDG MCJX19 were successfully analyzed in all samples.

The samples were analyzed under two (2) Sample Delivery Groups (SDGs) [SDGs MCJX19 and MCHX92). Validation was performed on a SDG basis and field blank results were applied to all samples.

Areas of concern with respect to data usability are listed according to the seriousness of the problem. These include:

ORIGINAL (Red)

MAJOR PROBLEM

The Contract Required Detection Limit (CRDL) standard recovery was < 50% for the Pb analyte in SDG MCJX19. The quantitation limits for this analyte in this SDG are unusable and have been qualified "R". The reported results may be biased extremely low; however, the "L" qualifier has been superseded by the "B" qualifier which will be discussed below.

MINOR ISSUES

The aqueous field blank (FB) had concentrations greater than the Instrument Detection Limit (IDL) for calcium (Ca) and Chromium (Cr) analytes. The reported results for these analytes in the affected samples which are less than five times (<5X) the blank concentrations may be biased high and have been qualified "B".

The continuing calibration blank (CCB) or preparation blank (PB) had reported results greater than the IDL for the Pb and silver (Ag) analytes in SDG MCJX19 and for the thallium (Tl) and vanadium (V) analytes in SDG MCHX92. The reported results for these analytes in the affected samples which are <5X the blank concentrations may be biased high and have been qualified "B".

The CRDL standard recoveries were high for several analytes listed below. The reported results which are <2XCRDL for these analytes may be biased high and have been qualified "K" unless superseded by the "B" qualifier.

Analyte	SDG Number
Cadmium (Cd)	MCHX92
Cr	MCJX19
Cobalt (Co)	MCHX92
Copper (Cu)	MCJX19
Ag	MCJX19

The matrix spike recoveries were low (<75%) for the antimony (Sb) and selenium (Se) analytes in SDG MCHX92. The quantitation limits and the reported results for these analytes in the affected samples may be biased low and have been qualified "UL" and "L", respectively.

ORIGINAL (Red)

The CRDL standard recoveries were low for several analytes as listed below. The reported results which are <2XCRDL and the quantitation limits for these analytes in the affected samples may be biased low and have been qualified "L" (unless superseded by the "B" qualifier) and "UL", respectively.

Analyte	SDG Number
Sb	MCJX19 MCHX92
Arsenic (As)	MCJX19 MCHX92
Tl	MCJX19 MCHX92

The analytical spike recoveries were low for the As, Se and Tl analytes in SDG MCJX19 and for the Se analyte in SDG MCHX92. The quantitation limits and reported results for these analytes in these SDGs may be biased low and have been qualified "UL" and "L", respectively.

The CCB or PB had negative values greater than the absolute value of the IDL for the Tl analyte in SDG MCJX19 and for the Ag and Tl analytes in SDG MCHX92. The quantitation limits for these analytes in these SDGs may be biased low and have been qualified "UL".

NOTES

The laboratory marked the results for the Se and Tl analytes in SDG MCHX92 on Form Is with a "W" indicating high analytical spike recoveries. High recoveries do not affect quantitation limit, therefore, no data were qualified during data validation.

The laboratory marked the results for the Pb analyte in SDG MCHX92 on Form Is with an asterisk "*" indicating that the duplicate results were outside of the contractual control limit (20% RPD). However, the duplicate results did not exceed the technical control limit of ±35% RPD for soil samples, therefore, no data were qualified during data validation.

The laboratory used 2.0 grams of soil instead of 5.0 grams for the CN analyses in SDG MCHX92; therefore, the resultant CRDL for the CN analyte in this SDG is 2.5 mg/Kg which is reflected on the data summary forms.

ORIGINAL (Red)

Two (2) field duplicate pairs were analyzed. The results and precision estimates for those analytes which exceeded the laboratory control limits (20%RPD, ±CRDL for aqueous or 35% RPD, ±2XCRDL for soil samples) are reported in Table 4.

Soil sample quantitation limits and reported results are calculated on the basis of the raw data values (in ug/L), the gram weight of sample used, the volume of the digestate, and the %solids according to the following equation:

$$mg/Kg = \frac{(\text{raw value, } \mu g/L)(\text{digestate volume, L})}{(\text{weight, g})(\%\text{solids}/100)}$$

To obtain quantitation limits, insert the IDL (Form X) for the raw value; refer to Form XIII to obtain each sample preparation weight and volume used. The quantitation limits factors thus obtained are specific for each sample and preparation method.

The data were reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses, with modifications for use within Region III.

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers added to the laboratory's results during evaluation.

ATTACHMENTS

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN
TABLE 2	GLOSSARY OF DATA QUALIFIER CODES
TABLE 3	DATA SUMMARY FORMS
TABLE 4	FIELD DUPLICATE RESULTS AND PRECISION ESTIMATES
APPENDIX A	RESULTS REPORTED BY LABORATORY FORM Is
APPENDIX B	TPO REPORT
APPENDIX C	SUPPORT DOCUMENTATION

SM401A02.HL

TABLE 1A

SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION

ANALYTE	SDG#	SAMPLES AFFECTED	POSITIVE VALUES	NON-DETECTED VALUES	BIAS	COMMENTS*
Sb	MCJX19	All samples		UL	Low	A (88.5%)
	MCHX92	MCJX05		UL	Low	A (80.0%) B (66.9%)
		All samples except MCJX05		UL	Low	B (66.9%)
As	MCJX19	MCJX19,MCJX20, MCJX23,MCJX27		UL	Low	A (89.2%)
		MCJX21,MCJX22, MCJX24,MCJX25, MCJX27		UL	Low	C (72.0%-83.5%) A (89.2%)
	MCHX92	MCJX05,MCJX06, MCJX09	L		Low	A (83.4%)
Cd	MCHX92	MCJX08,MCJX09, MCJX14	K		High	D (113%)
Ca	MCHX92	MCJX05	B		High	E (139 µg/L)
Cr	MCJX19	MCJX15,MCJX16, MCJX18,MCJX19, MCJX21,MCJX22, MCJX24-MCJX26	B		High	E (9.6 µg/L) D (115%,127%)
		MCJX28	K		High	D (115%,127%)
	MCHX92	MCJX01,MCJX02, MCJX04-MCJX06, MCJX08,MCJX09, MCJX13,MCJX14	B		High	E (9.6 µg/L)

* See explanation of Comments on Table 1B.

TABLE 1A

SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION

ANALYTE	SDG#	SAMPLES AFFECTED	POSITIVE VALUES	NON-DETECTED VALUES	BIAS	COMMENTS*
Co	MCHX92	MCJX03,MCJX05, MCJX06,MCJX11	K		High	D (111%)
Cu	MCJX19	MCJX15,MCJX16	K		High	D (114%)
Pb	MCJX19	MCJX15,MCJX16, MCJX21,MCJX27	B		High	F (1.5 µg/L) G (48.7%)
		MCJX18-MCJX20, MCJX22-MCJX26, MCJX28		R	Extremely Low	G (48.7%)
Se	MCJX19	MCJX16,MCJX23, MCJX26		UL	Low	C (52.4%-73.8%)
	MCHX92	MCJX01,MCJX11, MCJX13	L	UL	Low	C (83.4%,71.4%) B (64.5%)
		All samples except MCJX01,MCJX11, MCJX13	L	UL	Low	B (64.5%)
Ag	MCJX19	MCJX21	K		High	D (119%,117%)
		MCJX26	B		High	F (5.8 µg/L) D (119%,117%)
	MCHX92	All samples		UL	Low	H (-0.98 mg/Kg)
Tl	MCJX19	MCJX15,MCJX27		UL	Low	A (86.4%) C (82.6%-83.6%)
		MCJX16,MCJX18, MCJX28		UL	Low	A (86.4%)
		MCJX19,MCJX23-MCJX26		UL	Low	A (86.4%) I (-2.0 µg/L)
		MCJX20-MCJX22		UL	Low	A (86.4%) C (68.1%-80.5%) I (-2.0 µg/L)

* See explanation of Comments on Table 1B.

TABLE 1A

SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION

ANALYTE	SDG#	SAMPLES AFFECTED	POSITIVE VALUES	NON-DETECTED VALUES	BIAS	COMMENTS*
Tl	MCHX92	MCHX92	B		High	F (3.2 µg/L) A (57.5%)
		MCJX13,MCJX14		UL	Low	I (-3.0 µg/L)
		MCJX01,MCJX03-MCJX05,MCJX07-MCJX10	L	UL	Low	A (57.5%)
V	MCHX92	MCJX05	B		High	F (1.6 mg/Kg)

* See explanation of Comments on Table 1B.

ORIGINAL (Red)

TABLE 1B

CODES USED IN COMMENTS COLUMN

A = The CRDL standard recovery was low (<90%),[% recovery or range of recoveries is in parentheses]. The reported results which are < 2XCRDL and the quantitation limits may be biased low.

B = The matrix spike recovery was low (% recovery is in parentheses). The quantitation limits may be biased low.

C = The analytical spike recovery was low (<85%)[% recovery or range of recoveries is in parentheses). The reported results and quantitation limits may be biased low.

D = The CRDL standard recovery was high (>110%),[% recovery is in parentheses]. The reported results which are < 2XCRDL may be biased high.

E = The field blank had a result >IDL (the result is in parentheses). The reported results which are <5x the blank concentration may be biased high.

F = The continuing calibration blank (CCB) or preparation blank (PB) had results >IDL (the result is in parentheses). The reported results which are <5x the blank concentration may be biased high.

G = The CRDL standard recovery fell below 50% (% recovery is in parentheses). The reported results which are < 2XCRDL may be biased extremely low and the quantitation limits are unusable.

H = The PB had a negative value greater than the absolute value of the IDL (the result is in parentheses). The quantitation limits may be biased low.

I = The continuing calibration blank (CCB) had a negative value greater than the absolute value of the IDL (the result is in parentheses). The quantitation limits may be biased low.

TABLE 2

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION
(confidence concerning presence or absence of analytes):

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

(NO CODE) = Confirmed identification.

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

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

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

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

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

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

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

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

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

SUMMARY FORM: I N O R G A N I C S

Table 3

WATER SAMPLES

(ug/L)

Site Name: Hoffman Landfill

Case #: 21162 Sampling Date(s): 11/2/93 - 11/3/93

SDG: MCJX19

+ Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

CRDL	ANALYTE	MCJX15		MCJX16		MCJX18		MCJX19		MCJX20		MCJX21		MCJX22		MCJX23		MCJX24		MCJX25	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	Location	RW-1		RW-2		RW-4		SW-1		SW-2		SW-3		SW-4		SW-5		SW-6		SW-7	
												Duplicate of MCJX27									
200	Aluminum									[76.1]		[159]		202		[184]		[94.8]			
60	Antimony		UL		UL		UL		UL		UL		UL		UL		UL		UL		UL
10	*Arsenic								UL		UL		UL		UL		UL		UL		UL
200	Barium	[3.8]		[98.7]		255		[16.8]		[48.2]		[42.1]		[52.8]		[18.7]		[57.0]		[57.3]	
5	Beryllium																				
5	*Cadmium																				
5000	Calcium	9870		74200		45800		10900		16400		143000		42700		149000		53700		59100	
10	*Chromium	[9.7]	B	[7.1]	B	[7.3]	B	[7.6]	B			[8.4]	B	[9.0]	B			[7.5]	B	[7.4]	B
50	Cobalt															52.9					
25	Copper	[7.7]	K	35.2	K																
100	Iron	1780		1040		924		252		[88.8]		385		255		11000		285		844	
3	*Lead	[2.2]	B	[2.0]	B		R		R		R	[1.0]	B		R		R		R		R
5000	Magnesium	[946]		16300		12500		5060		[3700]		40500		11600		57100		15300		16900	
15	Manganese	54.4		90.1		92.4		72.6		48.2		35.1		90.8		5010		[14.8]		298	
0.2	Mercury																				
40	*Nickel															101					
5000	Potassium			[1130]		[1640]		[2620]		[1180]		[2230]		[1090]		[1440]		[2280]		[2200]	
5	Selenium				UL							[3.1]					UL				
10	Silver											[4.3]	K								
5000	Sodium	48100		[784]		[561]		[3320]		11100		90900		23300		12600		33900		33700	
10	Thallium		UL		UL				UL		UL		UL		UL		UL		UL		UL
50	Vanadium																				
20	Zinc	[16.4]		21.8		1030		27.5		23.7		25.1		[18.8]		22.6					
10	*Cyanide	11.4																			

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 07/90

SUMMARY FORM: INORGANICS

Table 3

WATER SAMPLES

(ug/L)

Site Name: Hoffman Landfill

Case #: 21162 Sampling Date(s): 11/2/93 - 11/3/93

SDG: MCJX19

+ Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

	Sample No.	MCJX26		MCJX27		MCJX28															
	Dilution Factor	1.0		1.0		1.0															
	Location	SW-8		SW-9		BLK-1															
				Duplicate of MCJX21		Field Blank															
CRDL	ANALYTE																				
200	Aluminum	[198]		286																	
60	Antimony		UL		UL		UL														
10	*Arsenic				UL																
200	Barium	[20.9]		[43.5]																	
5	Beryllium																				
5	*Cadmium																				
5000	Calcium	141000		146000		[139]															
10	*Chromium	[8.8]	B			[9.6]	K														
50	Cobalt	53.0																			
25	Copper																				
100	Iron	10400		847		[15.8]															
3	*Lead		R	[2.8]	B		R														
5000	Magnesium	55700		40300																	
15	Manganese	4770		64.8																	
0.2	Mercury																				
40	*Nickel	88.2																			
5000	Potassium	[1500]		[2630]																	
5	Selenium		UL																		
10	Silver	[5.2]	B																		
5000	Sodium	13700		91400																	
10	Thallium		UL		UL		UL														
50	Vanadium																				
20	Zinc	24.8		24.5																	
10	*Cyanide																				

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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A SUMMARY FORM: I N O R G A N I C S

Table 3

SOIL SAMPLES

(mg/Kg)

Site Name: Hoffman Landfill

Case #: 21162 Sampling Date(s): 11/2/93 - 11/3/93

SDG:MCHX92

+ Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

	Sample No.	MCHX92		MCJX01		MCJX02		MCJX03		MCJX04		MCJX05		MCJX06		MCJX07		MCJX08		MCJX09	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Solids	90.6		86.6		85.1		85.4		87.6		91.7		52.5		42.8		81.0		64.9	
	Location	SOURCE-6		SOURCE-1		SOURCE-2		SOURCE-3		SOURCE-4		SOURCE-5		SED-1		SED-2		SED-3		SED-4	
CRDL	ANALYTE																			Duplicate of MCJX14	
40	Aluminum	5240		3660		4790		5470		3800		5140		8140		10100		3430		4450	
12	Antimony		UL		UL		UL		UL		UL		UL		UL		UL		UL		UL
2	Arsenic	3.7		4.7		4.1		5.5		5.1		2.0	L	3.7	L	14.3		4.5		4.1	L
40	Barium	120		76.7		95.4		80.2		83.2		[26.0]		99.1		266		83.8		120	
1	Beryllium	1.4		0.99		1.0		1.1		0.98		[0.38]		[1.4]		2.7		[0.81]		1.4	
1	Cadmium	3.7		2.5		2.5		2.4		3.4						5.6		1.4	K	2.1	K
1000	Calcium	[667]		956		1680		[793]		805		[16.5]	B	[966]		78200		50100		24800	
2	Chromium	16.1		8.1	B	10.5	B	13.0		9.5	B	2.0	B	14.5	B	25.3		11.5	B	11.1	B
10	Cobalt	27.9		21.4		18.9		16.2	K	21.3		[1.8]	K	25.0	K	49.5		20.7		37.2	
5	Copper	26.9		21.1		22.0		23.1		24.9		[2.7]		24.5		28.9		21.5		20.8	
20	Iron	59000		43100		42700		43000		47300		10000		36200		85300		26600		32900	
0.6	*Lead	26.8		24.8		22.3		19.4		23.1		15.1		33.1		62.4		37.2		28.1	
1000	Magnesium	[619]		[579]		[700]		[679]		833		[194]		[1060]		12300		3280		1420	
3	Manganese	1220		595		656		431		639		22.1		274		1810		847		958	
0.1	Mercury																				
8	Nickel	30.5		27.2		22.5		22.4		25.6				37.9		83.1		35.7		69.6	
1000	Potassium	998		[728]		[826]		1070		1040		[515]		[1120]		[950]		[774]		[367]	
1	Selenium		UL	[0.41]	L		UL		UL		UL		UL	[0.63]	L		UL		UL		UL
2	Silver		UL		UL		UL		UL		UL		UL		UL		UL		UL		UL
1000	Sodium	[49.3]		[35.6]		[38.6]		[45.0]		[57.6]				[51.6]		[134]		[135]		[114]	
2	Thallium	[0.43]	B		UL				UL		UL		UL				UL	[0.43]	L		UL
10	Vanadium	29.2		20.5		23.4		24.0		21.3		[6.4]	B	27.4		37.8		22.5		19.7	
4	Zinc	125		134		96.4		131		119		18.8		141		295		176		210	
2.5	Cyanide																				

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 07/9

ORIGINAL (Red)

SUMMARY FORM: INORGANICS

Table 3

SOIL SAMPLES

(mg/Kg)

Site Name: Hoffman Landfill

Case #: 21162 Sampling Date(s): 11/2/93 - 11/3/93

SDG: MCHX92

+ Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

	Sample No.	MCJX10		MCJX11		MCJX12		MCJX13		MCJX14									
	Dilution Factor	1.0		1.0		1.0		1.0		1.0									
	% Solids	71.5		72.1		87.3		53.7		75.6									
	Location	SED-5		SED-6		SED-7		SED-8		SED-9									
CRDL	ANALYTE									Duplicate of MCJX09									
40	Aluminum	6640		3800		5170		6570		4110									
12	Antimony		UL		UL		UL		UL		UL								
2	Arsenic	12.5		7.1		7.5		15.0		6.3									
40	Barium	55.0		87.3		70.7		144		79.8									
1	Beryllium	2.5		1.3		1.9		3.5		1.5									
1	Cadmium	6.0		4.3		5.8		6.5		1.9	K								
1000	Calcium	3370		7890		5260		5850		4940									
2	Chromium	19.1		17.3		47.6		14.8	B	10.2	B								
10	Cobalt	90.7		20.4	K	52.1		335		29.5									
5	Copper	19.9		21.3		27.0		22.2		21.4									
20	Iron	93700		72200		88900		98600		36000									
0.6	*Lead	22.5		32.0		25.8		26.1		27.8									
1000	Magnesium	1510		1590		2210		1420		1270									
3	Manganese	6090		870		3720		27900		724									
0.1	Mercury																		
8	Nickel	111		37.5		106		710		59.3									
1000	Potassium	[538]		[688]		[442]		[686]		[359]									
1	Selenium		UL	[0.42]	L		UL	[0.63]	L		UL								
2	Silver		UL		UL		UL		UL		UL								
1000	Sodium	[49.4]		[47.3]		[51.7]		[64.6]		[103]									
2	Thallium		UL						UL		UL								
10	Vanadium	23.0		31.0		31.9		21.0		17.2									
4	Zinc	184		191		213		497		209									
2.5	Cyanide																		

CRDL = Contract Required Detection Limit

*Action Level Exists

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ORIGINAL (Red)

ORIGINAL (Red)

12.0 PHOTOGRAPHS

Source/Soil 1, collected at northcentral area of Landfill

Source/Soil 2, collected at center of Landfill

Source/Soil 3, collected at southcentral area of Landfill

Source/Soil 4, collected at southern end of Landfill

Source/Soil 5, background sample collected west side of Route 36

Source/Soil 6, surficial sample from debris exposed from installation of water line

SW/SED-1 (On-Site Pond)

SW/SED-2 (Background sample, Braddock Run south)

SW/SED-3 (Hoffman Drainage Tunnel outlet)

SW/SED-4 (Confluence of Braddock Run west and Braddock Run south)

SW/SED-7 (Confluence of unnamed stream and Braddock Run)

Confluence of unnamed stream and Braddock Run (SW/SED-7)
SW/SED-6 was collected from the unnamed (clear) stream

SW/SED-8 (Braddock Run east)

4-mile Topographic Map
Hoffman Landfill
(MD-4)