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Superfund Record of Decision:

Drake Chemical, PA

50272-101

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Third Remedial Action - Final

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16. Abstract (Limit: 200 words)

The Drake Chemical Site (DCS) is a 12.5-acre inactive chemical manufacturing facility located in Lock Haven, Clinton County, Pennsylvania. The area surrounding the site includes American Color and Chemical Company to the west, Hammermill Paper Company to the southwest, Bald Eagle Creek to the south, the west branch of the Susquehanna River to the north, and an apartment complex and a shopping center to the east. Bald Eagle Creek and the Susquehanna River are wetland areas and are used for recreation and fishing. Lock Haven residents do not use ground water for drinking purposes. The facility operated between 1951 and 1982 manufacturing chemical intermediates used in producing dyes, cosmetics, textiles, pharmaceuticals, and pesticides. The DCS facility includes two synthetic-lined wastewater treatment lagoons, an unlined leachate lagoon, and a dry unlined sludge lagoon. The water and sediments within the two lined impoundments are highly contaminated with site-related organic and inorganic contaminants. The site surface is covered with debris, chemical sludge, and contaminated soil. Approximately 252,000 yd^3 of soil, sludges and sediments are contaminated. The Drake Chemical Company was cited several times by State and Federal agencies for violating environmental and health and safety regulations. In 1982, EPA began an emergency removal action in which surface drums, surface sludges, and liquids
(See Attached Sheet)

17. Document Analysis a. Descriptors
Record of Decision
Drake Chemical, PA
Third Remedial Action - Final
Contaminated Media: gw, sediments, soil, sw
Key Contaminants: metals (arsenic, chromium, lead), organics (PAHs, phenols), VOCs (benzene, TCE, toluene)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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EPA/ROD/R03-88/058
Drake Chemical, PA
Third Remedial Action - Final

16. ABSTRACT (continued)

contained in process and storage tanks were removed and disposed of, and the site was fenced. A ROD signed in 1982 addressed the leachate stream that ran offsite towards Bald Eagle Creek, and remediation was completed in 1987. A subsequent ROD signed in May 1986 required demolition of onsite contaminated buildings and tanks and disposal in an offsite landfill. This work currently is being undertaken. The focus of the remedial action addressed in this ROD is remediation of the contaminated soil, sludges, and ground water at the site. The primary contaminants of concern affecting the ground water, surface water, soil, and sediments are VOCs including benzene, toluene, TCE, and xylenes, other organics including fenac, phenols, and PAHs, and metals including lead, chromium, and arsenic.

The selected remedial action for this site includes: excavation of approximately 252,000 yd^3 of contaminated sludge, soil, and sediments, followed by treatment in an onsite mobile rotary kiln incinerator, backfilling (possibly using the incinerator ash as backfill material), and installation of a vegetative cover; design and construction of an onsite wastewater biological activated carbon treatment plant with pump and treatment of the surface water, ground water, storm water, and aqueous wastes from the leachate lagoon at the treatment plant, followed by discharge to a local stream or POTW; and ground water monitoring. The estimated present worth cost for this remedial action is $97,363,000 with an average annual O&M of $787,000.

RECORD OF DECISION

Drake Chemical Site
Lock Haven, Pennsylvania

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Drake Chemical Site in the City of Lock Haven, Clinton County, Pennsylvania. This decision is developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Contingency Plan. The decision is based on the data derived from the past seven years of site investigations and coordination with the Commonwealth of Pennsylvania and local agencies. This information has been compiled into the Administrative Record for the site investigations and an index of the Administrative Record is attached. After review of the site investigations, the Administrative Record, and a public comment period, the Agency is selecting this remedial action. The Commonwealth of Pennsylvania has concurred in the selected remedy and a copy of its letter is attached.

Description of the Selected Remedy

The purpose of this alternative is to excavate the contaminated soils, sludges, and leachate lagoon sediments at the site and decontaminate this material using a transportable, onsite incinerator. The following tasks will be performed as part of this remedial action.

- install necessary flood control measures
- remove aqueous wastes from leachate lagoon area and treat
- install permanent stormwater management controls in the leachate lagoon area and other areas to be excavated
- excavate approximately 252,000 cubic yards of contaminated sludge/soils/sediments and decontaminate using a transportable, onsite, rotary kiln incinerator (The thermal treatment unit must comply with incineration permit requirements including air emissions and monitoring.)
- analyze incinerator ash and use as backfill if acceptable in accordance with State requirements (Further treatment of ash unsuitable for backfill may be necessary for onsite disposal.)
- remove unnecessary obstacles, such as water and sewage lines from the facilities and maintain local lines that are presently in use

- backfill excavated areas with suitable material, regrade to provide positive drainage, and revegetate the topsoil to control erosion

- collect and treat all contaminated water that enters the site (e.g., groundwater, stormwater, and decontaminated water) at the groundwater treatment system

In addition to decontamination of the sludge/soils/sediments this remedial action will include pumping and treating the contaminated groundwater at the site to an acceptable level for discharge. The following tasks will be implemented as part of this remedial action.

- install necessary flood control measures

- design and construct an onsite wastewater treatment plant

- install extraction wells in the areas of groundwater contamination within the property boundaries of the former Drake Chemical facilities and in the properties adjacent to the facility in the south and east directions

- pump groundwater to the treatment system

- treat by using Biological Activated Carbon (BAC)

- discharge effluent to Bald Eagle Creek either through the underground conduit constructed for the Phase I leachate stream or through the Lock Haven sewage treatment facility (The water treatment unit must comply with permit requirements for discharge of treated water)

- analyze residuals (e.g., sludgecake) and use as backfill if acceptable in accordance with State requirements (Further treatment may be necessary for onsite disposal.)

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate for this remedial action, and is cost effective. This remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Stanley Laskowski, Acting Regional Administrator

9-29-88
Date

The Decision Summary
Drake Chemical Site
Lock Haven, Pennsylvania

SITE DESCRIPTION AND HISTORY

The Drake Chemical Site is an inactive chemical manufacturing facility that operated from 1951 to 1982 (see Figure 1, Site Location Map). During its operation, the Drake Chemical Company manufactured chemical intermediates used in the dye, cosmetics, textiles, pharmaceuticals, and pesticides industries.

Immediately adjacent to and west of the Drake Chemical Site is the American Color and Chemical Company which is currently undergoing a Resource Conservation and Recovery Act (RCRA) cleanup. The Hammermill Paper Company operates an industrial facility 1/2-mile southwest of the site. Within 1/4-mile are an apartment complex, a shopping center, and Castanea Township Park. A major tributary of the Susquehanna River, Bald Eagle Creek, flows less than 1/2 mile south of the site; 3/4-mile north, the creek flows into the West Branch of the Susquehanna River.

Site features at the 12.5-acre Drake Chemical Site include two synthetic-lined wastewater treatment lagoons, an unlined leachate lagoon, a dry and unlined sludge lagoon, a a trailer and five buildings that were used at the facility (see Figure 2, Site Plan). Much of the site surface is covered by assorted debris, chemical sludge, and contaminated soils. Buildings, tanks, and surface impoundments remaining onsite are currently slated for demolition and removal in 1988 as part of the Phase II site remediation.

The Drake Chemical Company was cited many times, by State and Federal agencies, for violating environmental and health and safety regulations. In 1982, after the company failed to respond to EPA's requests to clean up the site, the EPA began an emergency removal action. As a result, surface drums, surface sludges, and liquids contained in process and storage tanks were removed and disposed of, and the site was fenced. Subsequently, a Superfund Remedial Investigation/ Feasibility Study (RI/FS) was initiated in 1983. The RI/FS was divided into two areas of concentration: Phase I focused on a leachate stream that ran offsite towards Bald Eagle Creek. Following completion of the Phase I RI/FS in 1984, a

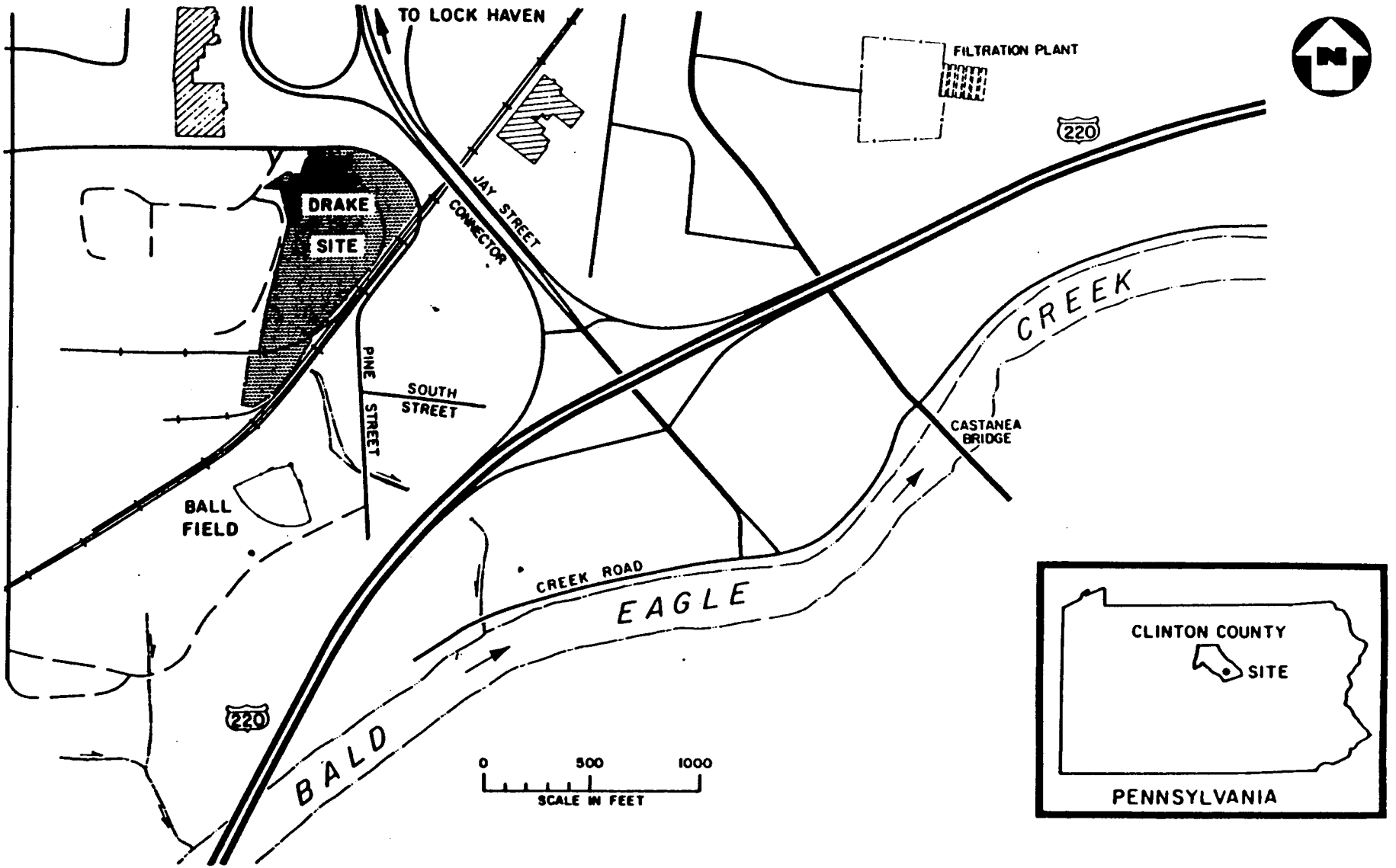


FIGURE 1

SITE LOCATION MAP
DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA

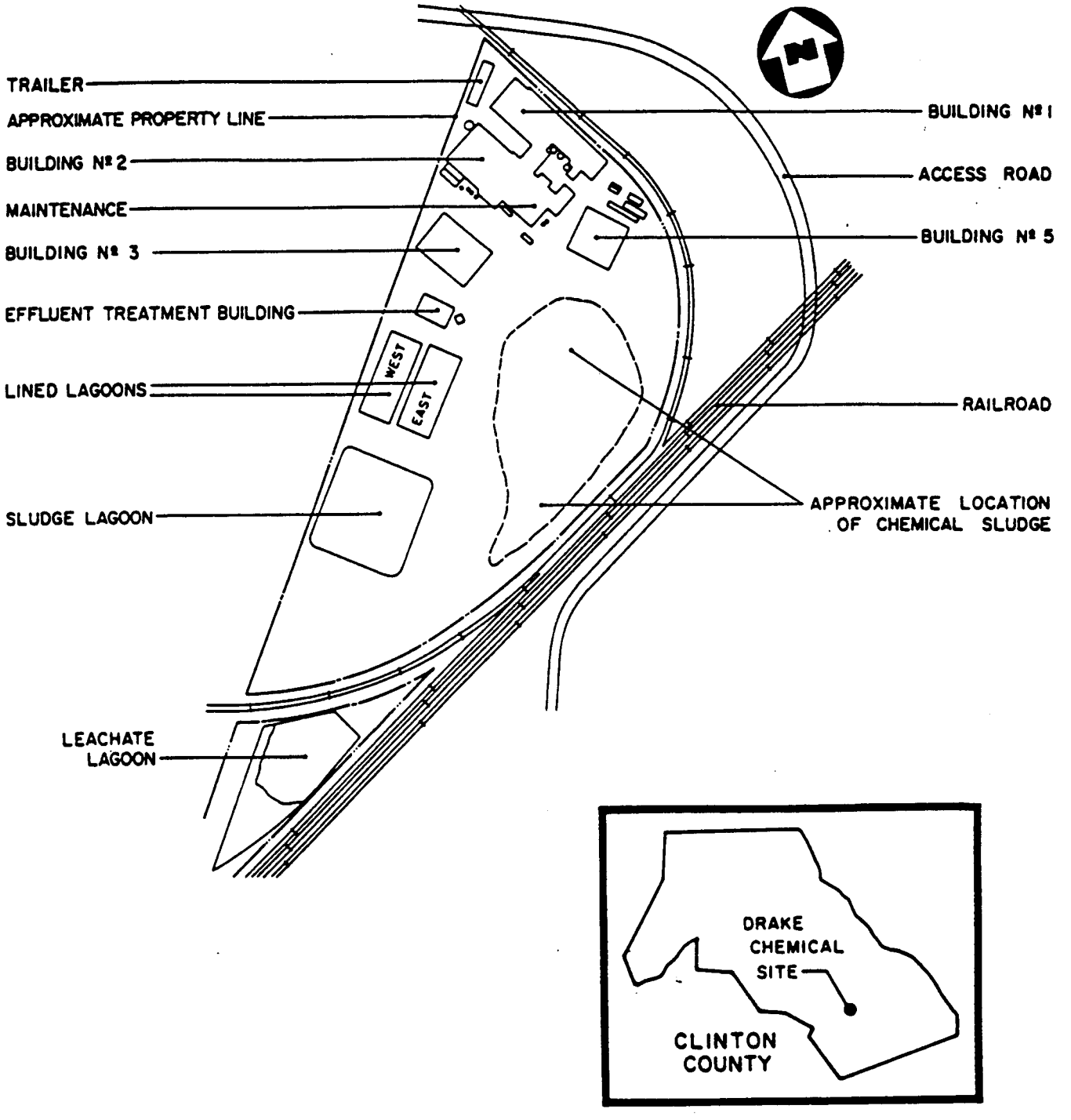


FIGURE 2

SITE PLAN
DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA
NOT TO SCALE

Record of Decision (ROD) was signed and led to remediation of the leachate stream. The remediation involved covering the upper reaches of the stream with natural soils and a clay cap and installing a conduit drain from the site to Bald Eagle Creek. Contaminated sediments that were excavated from the area were placed onsite in a temporary storage impoundment. The phase I remediation was completed in 1987.

The Phase II RI/FS was divided into two operable units, one addressing onsite buildings and surface features, and the other addressing soils, sludges, and groundwater. However only the first unit lead to an Agency decision. The Phase II RI/FS concluded that buildings and other surface features onsite were contaminated and required remediation. Based on the Phase II RI/FS, the Phase II ROD was signed in May 1986. It recommended draining and removing two lined lagoons and disposing of the materials. The Phase II ROD also included demolition of the buildings and tanks for disposal in an offsite landfill. The Phase II site remediation work is currently underway. In 1986, no decision was made for remediation of the soil, sludges, and groundwater and this became the focus of this Phase III RI/FS and ROD.

PHYSICAL CHARACTERISTICS OF STUDY AREA

Surface Features

At least three backfilled sludge lagoons are present at the Drake Chemical Site as shown on Figure 2. In addition, sludge was found in the area south of the former office trailer and decontamination pad. The ground surface reflects the extent of the three lagoons, whereas the area near the trailer and building No 1 has no surface expression to indicate lateral extent of the sludge material.

A slow, but continuous leachate seep was observed at the base of the dike near the southeast corner of the east lagoon (See Figure 2). The leachate infiltrated the ground approximately 10 feet from the seep, leaving surface stains along a linear flow path, up to the point of infiltration.

The leachate lagoon at the southern tip of the site contains water to an approximate depth of 5 feet. The other unlined lagoons were dry throughout the field investigation from October 1987 to January 1988.

Surface Water

Offsite surface water includes Bald Eagle Creek, south of the site, and the West Branch of the Susquehanna River, north of the site. Three of the lagoons onsite also contained water and were included in the field sampling activities.

A total of 13 surface water and sediment sample pairs were collected from surface water bodies during the Phase III field investigations. These locations are shown on Figure 3.

Both Bald Eagle Creek and the West Branch of the Susquehanna River are clearly wetland areas and are used for recreation and fishing. The three on site lagoons were not considered as wetlands. An examination of aerial photographs from Environmental Photographic Interpretation Center (EPIC) reveals that the three onsite surface water bodies were constructed during the late 50's probably as waste impoundments. The shape of the impoundments has changed as fill material was added to displace their contents.

There is no knowledge of aquatic species habitating these impoundments. The two lined impoundments clearly do not support any terrestrial flora. Flora surrounding the unlined leachate lagoon is typical of the surrounding area.

The water and the sediments within the two lined impoundments are highly contaminated by site related organic and inorganic contaminants. The leachate lagoon at the south end of the site is the topographical low and is felt to be the recipient of all precipitation not lost to infiltration or evaporation.

Soils and Overburden Material

The alluvial deposits which underlie the site and adjacent areas consist of clay to sandy clay floodplain deposits. These coarsen in grain size at depth to sand and gravel stream channel deposits, then finally to medium to coarse grained sands mixed with gravel-sized sandstone fragments. The clay and sandy clay layer occurs from ground surface to an average depth of 15 feet, based on both onsite and offsite soil borings throughout the study area. This clay-rich layer varies laterally throughout the study area from brown and gray sandy clay to an almost pure clay lense, colored gray with orange mottling. Based on the new and existing data, the general lithology of the upper 15 feet of overburden material interrelated as floodplain deposits, may be thought of as a layer of sandy clay with various lenses of clay dispersed throughout.

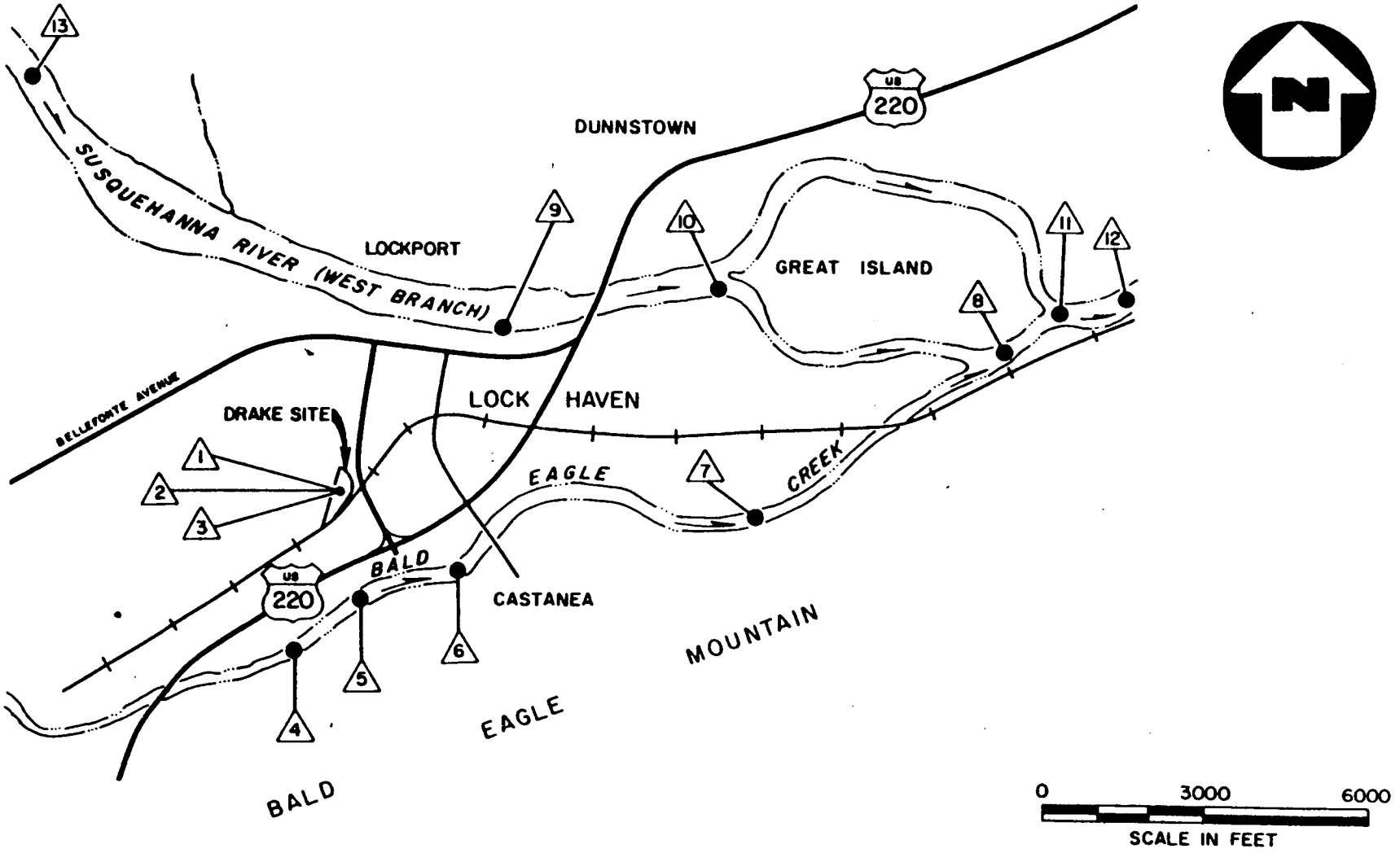


FIGURE 3

SURFACE WATER / SEDIMENT SAMPLING POINTS
DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA

Below approximately 15 feet, the alluvial sediments increase in grain size with increasing depth to sand and gravel and then to sand with gravel and cobble-sized sandstone fragments. These sandstone fragments may have originated from the adjacent Bald Eagle Mountain.

Buried Channel

Based on the Phase II and Phase III RIs, there is a buried alluvial channel oriented in an east-west direction paralleling Bald Eagle Creek. The sediment within the erosional channel contains quartz and feldspar gravel, which is unique to the area. The quartz and feldspar gravel infer an igneous source material that is not common to the area bedrock. This gravel may be glaciofluvial in origin.

Bedrock

The study area is situated on the north limb of a northeast trending anticline that is part of the Valley and Ridge Physiographic Province. The West Branch Valley is the result of differential erosion of non-resistant sedimentary rock units (i.e. shale, claystone, limestone). The underlying bedrock throughout the Drake Chemical Site study area has a regional dip of 20^{o} to 50^{o} to the northwest (Vendel Enviro-Industrial Consultants, Inc., 1987).

According to a local study performed by the U.S. Army Corps of Engineers, the Drake Chemical Site is underlain by shales of the Marcellas Formation.

Six bedrock wells were drilled and installed during the Phase III RI field investigation to further investigate groundwater conditions within bedrock. The bedrock is a soft gray claystone to shaley claystone and medium hard limestone ranging from less than 1 foot to more than 10 feet in thickness occur from a depth of 110 feet (onset of rock coring operations) to the total depth of the boring at 141 feet below ground surface. This 31-foot interval ranges from very broken to blocky in the alternating sequences of claystone and limestone. Portions of the blocky limestone reveal former highly fractured zones bound within a secondary, calcite-cement matrix. Based on rock core data, the Keyser/Oldport Limestone Formation contains a variety of lithologies throughout the study area.

Hydrogeology

Groundwater flows north, east, and south from the Drake Chemical Site, then gradually heads to the south and southeast toward Bald Eagle Creek, based on the January 1988 water level elevations taken from new and existing monitoring wells screened at or near the water table.

An analysis of the flow patterns based solely on the monitoring wells screened in bedrock shows a less detailed but similar groundwater flow direction. The buried channel apparently does not affect or influence groundwater flow direction or contaminant migration.

There is no indication of a vertical hydraulic gradient, although there are minor differences in water level elevations within well clusters that are screened in various lithologies and at different depths. Regardless, no set pattern is observed.

Field Activities

Forty-one test pits were excavated during the field investigation to collect information necessary to characterize the contaminated soils and sludges according to contaminant type and concentration, mass-volume, and physical location. Each test pit was excavated to the water table or a maximum of 15 feet. The pits were located as near to the proposed 100-foot by 100-foot grid spacing as possible, although minor adjustments were made. Figure 4 depicts the 41 test pit locations. Thirty-two of the test pits were located within the fenced area of the Drake Chemical Site and nine test pits were situated on the Gorham Property, immediately northeast of the former Drake facility. In addition, six test borings were drilled adjacent to areas where the excavation of test pits was difficult because of sidewall collapse. A total of 28 borings were drilled and 22 monitoring wells installed during Phase III. Monitoring well MW-M108 was installed in one of the onsite test borings and was the only onsite well installed during the Phase III RI. Two soil borings were drilled offsite to explore for the buried erosional channel which was discovered during the previous RI. Both borings successfully located the channel soil boring and one was converted to monitoring well MW-M125. An additional 20 soil borings and monitoring wells were installed in 13 locations throughout the study area as shown in Figures 4 & 5. Several locations have wells at different depths.

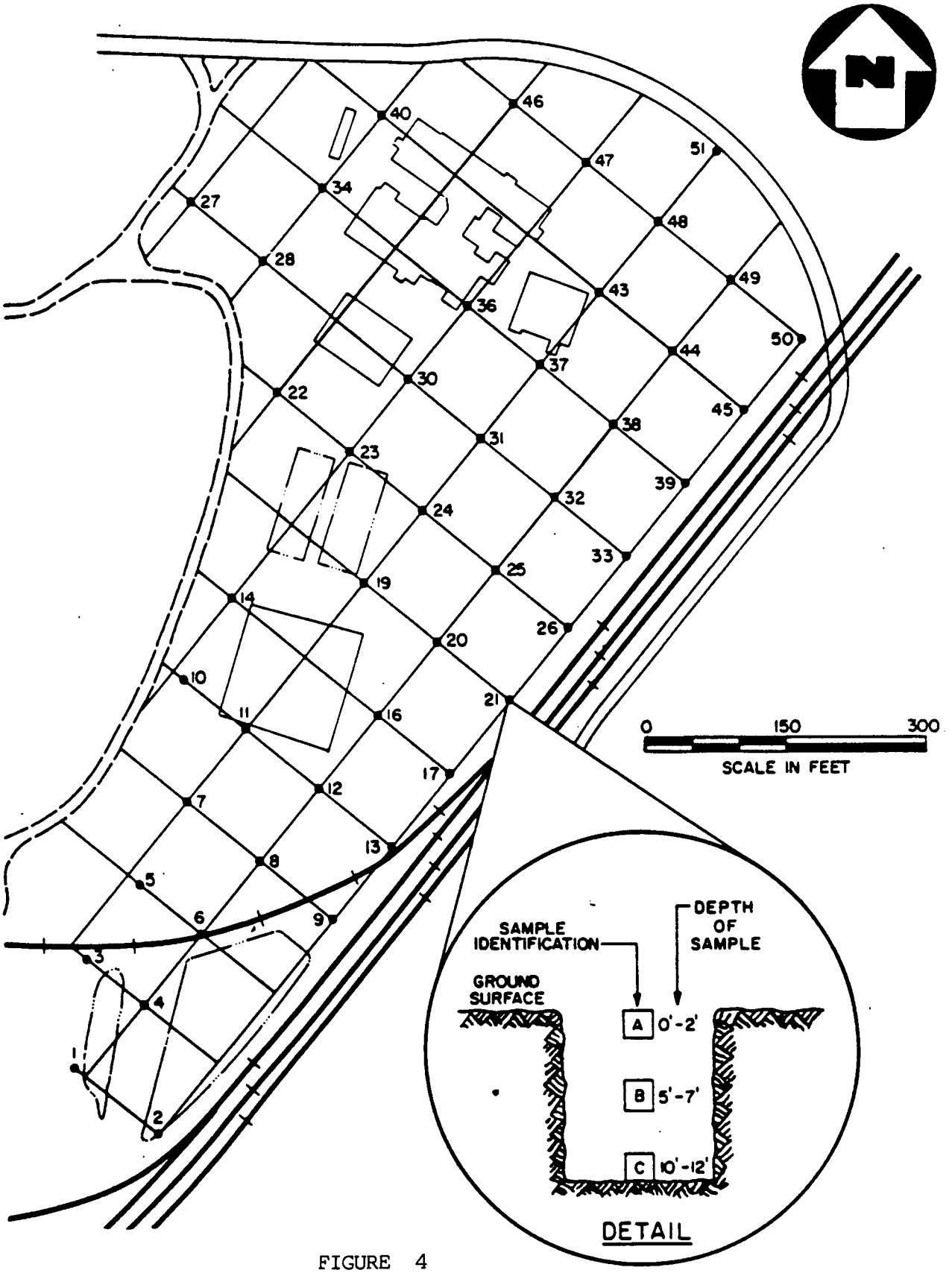


FIGURE 4

SOIL SAMPLING LOCATIONS
DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA

Observations from Test Pit Operations

During field operations various observations were made.

- Buried wastes were identified outside the fenced portion of the Drake Property. For example:
  - A 6-inch drain pipe, uncovered in test pit number T-44, was transporting leachates from an unknown source on Drake Chemical Site off site to the Gorham Property.
  - A partially buried bag of a red substance was uncovered near the well cluster near MW-M107.
- A blue plastic buried liner material was observed at about 11.5 feet in soil boring SB-31. During drilling, the drill water was draining beneath a partially buried piece of blue plastic "liner" at the surface adjacent to the boring.
- Three distinct sludge-filled lagoons were located. An area of soil covered sludge was located just south of the decon pad in test pit TP-28. (This may be part of the Old Pennsylvania Canal.)
- The sludge appeared to be layered as follows:
  - Alternating layers of cream-white and red-stained material that was slightly odorous ranged from very viscous to a hard crust
  - Less distinct layering of dark blue to green material had a more distinct color and was viscous to liquid.
  - A black layer of highly odorous material ranged from liquid to very liquid.
- The southern end of the site contains buried debris resembling possible flood debris. This area served as a dump site for the debris cleaned up following the major flood that took place during 1972.

EXTENT OF CONTAMINATION

Overview

Site associated contaminants were found throughout the study area in soil, surface water, sediment, and groundwater samples. The degree of contamination, however, varies throughout the site. Analysis of the various media detected an unusually long list of organic compounds and metals. The entire list is presented in the RI, but a summary of the high and low detection range is included here as Table 1. In general, the occurrence and concentration of contaminants within a given media is greatest on site and immediately off site, particularly on the Gorham property, which is in the direction of groundwater flow.

To facilitate the assessment of the extent of groundwater contamination and to provide a basis for identifying the scope of groundwater remediation strategies, the study area has been divided into three zones which are depicted in Figure 7. Zone 1 groundwater is more severely affected immediately under the site. Contamination was also detected in groundwater samples taken from monitoring wells located between the Pennsylvania Railroad track bed and the northern berm of Route 220 (Zone 2) and monitoring wells between the southern berm of Route 220 and the Bald Eagle Creek (Zone 3). Site-related contaminants showed a general attenuating of concentration in Zone 2, as would be expected with migration in the direction of groundwater flow. Some contamination is present in Zone 3 groundwater but the extent of pollution is less than that found in Zones 1 and 2.

Area surface waters and sediment are also affected by site related contaminants. These medias are most likely to be affected by groundwater recharge to surface waters, not by an overload flow of contaminants. However, it is probable that site related contamination measured in river reach sediments below the site is largely through the former leachate stream. Contaminants occurring upstream, however, may be a result of regional flooding events or from industrial applications of pesticides.

SOILS AND SLUDGES

Site soil is contaminated by volatile organic compounds, base/neutral acid extractables, fenac, B-napthylamine and inorganics. Some very high and consistent concentrations of organics of (i.e., fenac) are observed.

Table 1 presents the results of field screening data for volatile organic analyses and fixed base phenolic analyses obtained from samples taken during test pitting activities.

The field screening revealed that the bulk of the vadose zone on the site is contaminated at varying concentrations by chlorinated solvents, benzene, toluene, xylenes, and ethylbenzenes. Substituted chlorinated phenols and alkyl phenols are also present.

These compounds occur throughout the site regardless of sampling depth; therefore, no one particular area of the site or the adjacent Gorham property can be considered a more likely source of contamination to the surrounding environment.

The significance of this finding has major implications for soil (source) remediation strategies. Since contaminants are homogeneously distributed throughout the soils and sludges in the vadose zone, the total quantity of material requiring treatment would be approximately 252,000 cubic yards.

Inorganics, including cyanide, mercury, nickel, lead, chromium, and cadmium, were also detected and may or may not occur as a result of site contamination. The compounds lead, nickel, chromium, barium, aluminum, iron, manganese, and magnesium occur with greatest frequency and in large concentrations. Heavy metals including mercury and selenium were present but did not occur in great concentrations or frequency.

The RI indicates that cadmium clearly exceeds expected ranges and is probably site related. The contrast is less dramatic for cobalt, copper, lead, and silver; however, it cannot be concluded that they are not residual contaminants from past waste practices at the site.

SURFACE WATERS

Results of surface water sampling and analysis for offsite surface waters in the regional water shed are presented in Table 1. Evidence that offsite surface waters are affected by site-related contamination is demonstrated in samples collected downstream of the site. The detection of fenac in samples collected from locations 5, 6, and 7 on Bald Eagle Creek and locations 8, 11, and 12 on the West Branch Susquehanna River support this assessment.

SUMMARY OF REPRESENTATIVE CONTAMINANTS
CONCENTRATIONS AND OBSERVATIONS
OBSERVED AT THE DRAKE CHEMICAL SITE
PHASE III RI/FS

Media	Compounds	Concentration Range	Number of Observations
Surface Water	Fenac	0.9 - 4,900 ug/l	7 of 13
	Benzoic Acid	36 ug/l	1 of 13
	2,4-dimethylphenol	7 ug/l	1 of 13
	2,4,5-trichlorophenol	6 ug/l	1 of 13
	Nickel	16 - 35 ug/l	11 of 13
	Silver	10 -17 ug/l	2 of 13
	Lead	16 ug/l	1 of 13
	Chromium	13 ug/l	1 of 13
	Cobalt	12 - 25 ug/l	12 of 13
	Aluminum	97 - 3,910 ug/l	12 of 13
	Barium	36 - 89 ug/l	13 of 13
Sediments	Chlorobenzene	2 - 9,100 ug/l	4 of 13
	Fenac	24 - 1,500,000 ug/l	9 of 13
	Toluene	710 - ug/kg	1 of 13
	Benzene	100 ug/kg	1 of 13
	1,2-dichlorobenzene	70 - 8,600 ug/kg	4 of 13
	1,4-dichlorobenzene	290 - 140,000 ug/kg	3 of 13
	1,2,4-trichlorobenzene	170 - 140,000 ug/kg	3 of 13
	Tetrachloroethene	3 - 47 ug/kg	3 of 13
	Benzoic Acid	450 - 1,800 ug/kg	3 of 13
	Phenol	740 - 2,700 ug/kg	2 of 13
	Total Xylenes	20,000 ug/kg	1 of 13
	Benzo(b) fluoranthene	210 - 100,000 ug/kg	13 of 13
	Benzo(a) anthracene	130 - 1,200 ug/kg	2 of 13
	Napthalene	370 - 43,000 mg/kg	2 of 13

SUMMARY OF REPRESENTATIVE CONTAMINANTS,
CONCENTRATIONS AND OBSERVATIONS
OBSERVED AT THE DRAKE CHEMICAL SITE
PHASE III RI/FS
PAGE TWO

Media	Compounds	Concentration Range	Number of Observations
Sediments (cont.)	Aluminum	2,320 - 35,500 mg/kg	13 of 13
	Barium	47 - 257 mg/kg	13 of 13
	Chromium	8.6 - 69 mg/kg	13 of 13
	Lead	13 - 113 mg/kg	13 of 13
	Mercury	290 - 820 mg/kg	4 of 13
	Nickel	12 - 373 mg/kg	13 of 13
	Cyanide	2.4 - 766 mg/kg	3 of 13
	Arsenic (total)	5.5 - 27 mg/kg	10 of 13
	Benzo(k) fluoranthene	210 - 3,300 ug/kg	9 of 13
	Fluoranthene	110 - 3,200 ug/kg	5 of 13
	Pyrene	150 - 3,400 ug/kg	4 of 13
	Chrysene	140 - 2,300 ug/kg	9 of 13
	Benzo(a) pyrene	91 - 1,800 ug/kg	8 of 13
	Pentachlorophenol*	150 - 1,200 ug/kg	5 of 13
Soils	Fenac	3.8 - 8,200 ug/kg	32 of 42
	Ethylbenzene	1 - 27,000 ug/kg	11 of 42
	Total Xylenes	3 - 220,000 ug/kg	15 of 42
	Chlorobenzene	2 - 14,000 ug/kg	24 of 42
	Benzo(a) anthracene	100 - 42,000 ug/kg	15 of 42
	1,2-dichlorobenzene	200 - 100,000 ug/kg	10 of 42
	1,4-dichlorobenzene	190 - 12,000 ug/kg	12 of 42
	(Total) Arsenic	2 - 21 mg/kg	29 of 42
	Nickel	3 - 41 mg/kg	37 of 42
	Chromium	6.8 - 269 mg/kg	40 of 42

SUMMARY OF REPRESENTATIVE CONTAMINANTS,
CONCENTRATIONS AND OBSERVATIONS
OBSERVED AT THE DRAKE CHEMICAL SITE
PHASE III RI/FS
PAGE THREE

Media	Compounds	Concentration Range	Number of Observations
Soils (Cont.)	Lead	3.3 - 1,170 mg/kg	31 of 42
	naphthalene	74 - 7,000 µg/kg	8 of 42
	B-napthylamine	470 - 1,500,000 ug/kg	18 of 42
	1,2,4-trichlorobenzene	98 - 21,000 ug/kg	8 of 42
	Pentachlorophenol	1,200 - 130,000 ug/kg	3 of 42
	Phenanthrene	120 - 140,000 ug/kg	6 of 42
Ground-water			
Zone 1	Fenac	20 - 20,000 ug/l	12 of 15
	B-napthylamine	1 - 3,000 ug/l	8 of 15
	Arsenic (total)	5.5 - 400 ug/l	6 of 15
	Barium	28 - 14,800 ug/l	10 of 15
	Chromium	10.3 - 448 ug/l	10 of 15
	Lead	15,000 - 23,700 ug/l	4 of 15
	Mercury	0.2 - 1 ug/l	4 of 15
	Nickel	31.5 - 424 ug/l	6 of 15
	Silver	19 ug/l	1 of 15
	Cyanide	10 -6,780 ug/l	4 of 15
	Toluene	1.3 - 8,100 ug/l	10 of 15
	Chlorobenzene	72 - 18,000 ug/l	12 of 15
	1,2-dichloroethane	0.1 - 5,100 ug/l	14 of 15
	trichloroethene	1.4 - 500 ug/l	11 of 15
	1,2-dichlorobenzene	4.7 - 440 ug/l	8 of 15
	1,4-dichlorobenzene	3.4 - 100 ug/l	9 of 15

SUMMARY OF REPRESENTATIVE CONTAMINANTS,
CONCENTRATIONS AND OBSERVATIONS
OBSERVED AT THE DRAKE CHEMICAL SITE
PHASE III RI/FS
PAGE FOUR

Media	Compounds	Concentration Range	Number of Observations
Ground-water			
Zone 2	Fenac	7.6 - 9,200 ug/l	5 of 13
	B-napthylamine	12 ug/l	1 of 13
	Chlorobenzene	2.4 - 11,000 ug/l	6 of 13
	1,2-dichloroethane	6.7 - 6,800 ug/l	6 of 13
	Trichloroethene	23 - 130 ug/l	3 of 13
	Arsenic (total)	3.9 - 35.4 ug/l	6 of 13
	Nickel	17 - 260 ug/l	11 Of 13
	Chromium	5 - 125 ug/l	9 of 13
	Mercury	0.3 -0.5 ug/l	2 of 13
	Lead	49 - 139 ug/l	4 of 13
	Cadmium	4.3 - 100 ug/l	4 of 13
Ground-water			
Zone 3	Fenac	0.6 - 700 ug/l	7 of 13
	Cyanide	16 ug/l	1 of 13
	1,2-dichloroethane	0.1 - 950 ug/l	8 of 13
	Chlorobenzene	40 ug/l	1 of 13
	Barium	35 - 5,390 ug/l	12 of 13
	Cadmium	5 - 34 ug/l	7 of 13
	Cobalt	10 - 679 ug/l	9 of 13
	Mercury	0.2 - 1.7 ug/l	6 of 13
	Nickel	17.6 - 1,400 ug/l	8 of 13
	Chromium	9.5 - 468 ug/l	6 of 13
	Lead	1.4 - 535 ug/l	4 of 13

* Not attributed specifically to the Drake Site.

Evidence that site-related contaminants occur in surface waters in the watershed above the site (up gradient) is also indicated. The site-specific contaminant detected in both upstream Susquehanna River and Bald Eagle Creek samples is fenac which, because of area hydrology, is not likely to have occurred from site drainage, but may have occurred from regional flooding events.

Inorganic compounds including aluminum, barium, calcium, cobalt, chromium, iron, lead, nickel, potassium and sodium are found at varying concentrations in samples taken throughout the area but, because of their random distribution including upgradient samples (locations 4 and 13) and possible natural occurrence, they cannot be attributed specifically to the Drake Chemical Site.

Site surface lagoons are contaminated by inorganics, base/neutral acid extractables and fenac. The observed, site-related contamination (i.e., organics, especially fenac) is not unexpected since the two lined lagoons are used for the impoundment of wastewater from the site. Contamination observed in surface water from the leachate lagoon is also not unexpected. This lagoon is at the topographical low point of the site and is believed to be the recipient of surface runoff.

SEDIMENTS

The most significant site-related contaminants (i.e., fenac, phenol, chlorobenzene, 4-methylphenol) are detected in samples taken from points that are part of the normal downstream hydrologic flow pattern of the watershed as expected. The compound fenac is found in upstream samples as well. Its occurrence in these locations may be a result of deliberate application for plant control purposes and/or distribution during regional flooding events. The occurrence of chlorobenzene in upstream sediment samples supports the assessment that regional flooding events were probably major contributors to the migration of site-related compounds to upstream locations.

- Fenac, chlorobenzene, and other site-related compounds were observed in upstream samples on Bald Eagle Creek and the West Branch, Susquehanna River.

- Fenac and chlorobenzene were not observed in the West Branch, Susquehana River north of the site above the confluence.

- All samples contain varying amounts of polynuclear aromatic hydrocarbons and inorganics which may or may not be associated with the Drake Chemical Site.

- The compound pentachlorophenol is found sporadically throughout the area and in three onsite samples. Due to the occurrence of this compound in the upstream Susquehanna River sediment and its apparent absence in downstream Bald Eagle Creek sediments the occurrence of the compound is not believed to be site related.

Onsite sediment samples taken from the holding lagoons are highly contaminated by volatile organics, fenac, and base/neutral acid extractable compounds. As previously stated for the onsite surface waters, this observation is in agreement with expectations.

GROUNDWATER

VOAs

As previously mentioned, to facilitate assessment of the extent of groundwater contamination and to provide a basis for identifying the scope of groundwater treatment and remedial technologies, the study area has been divided into three logical zones. Zones are based on physical boundaries and levels of contamination. Figures 5, 6 and 7 show the location of the monitoring wells and the physical boundaries for these zones.

- Zone 1 represents groundwater beneath the site and the Gorham Property. Groundwater in Zone 1 have been the most severely impacted.

- Zone 2 groundwater include those underlying the area between Zone 1 (i.e., the site) and State Route 220. This area south of the site has been less severely impacted by site related contamination than Zone 1.

- Zone 3 groundwater are those south of State Route 220 to Bald Eagle Creek.

Table 1 presents the summary of the results of volatile organic compound analysis obtained from both rounds of groundwater sampling activities.

In general, samples taken from monitoring wells in all three zones are affected by site-related contaminants. Groundwater in the Zone 1 area is characterized by trichloroethene, chlorobenzene, ethylbenzene,

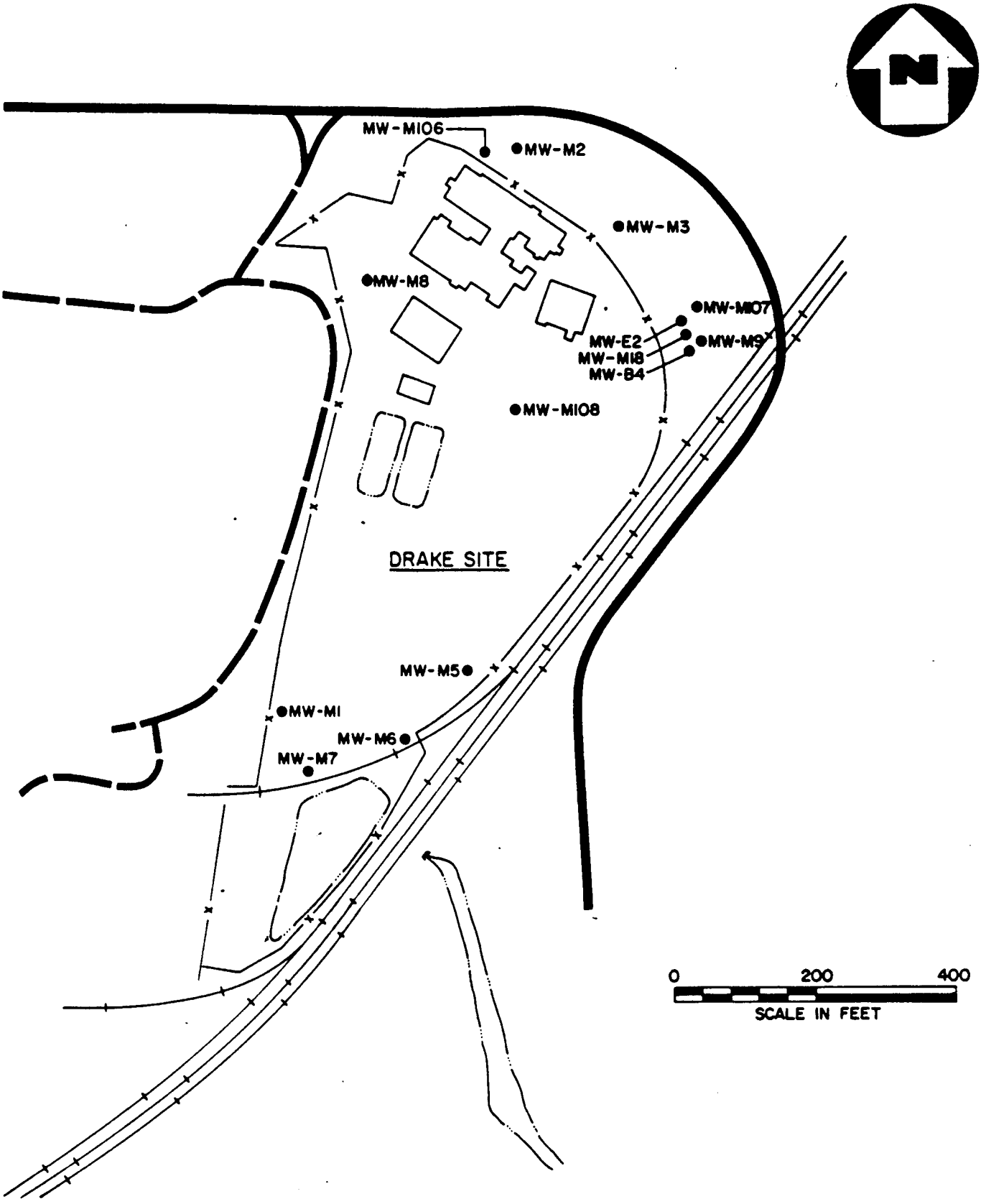


FIGURE 5

ONSITE GROUNDWATER SAMPLING LOCATIONS
DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA

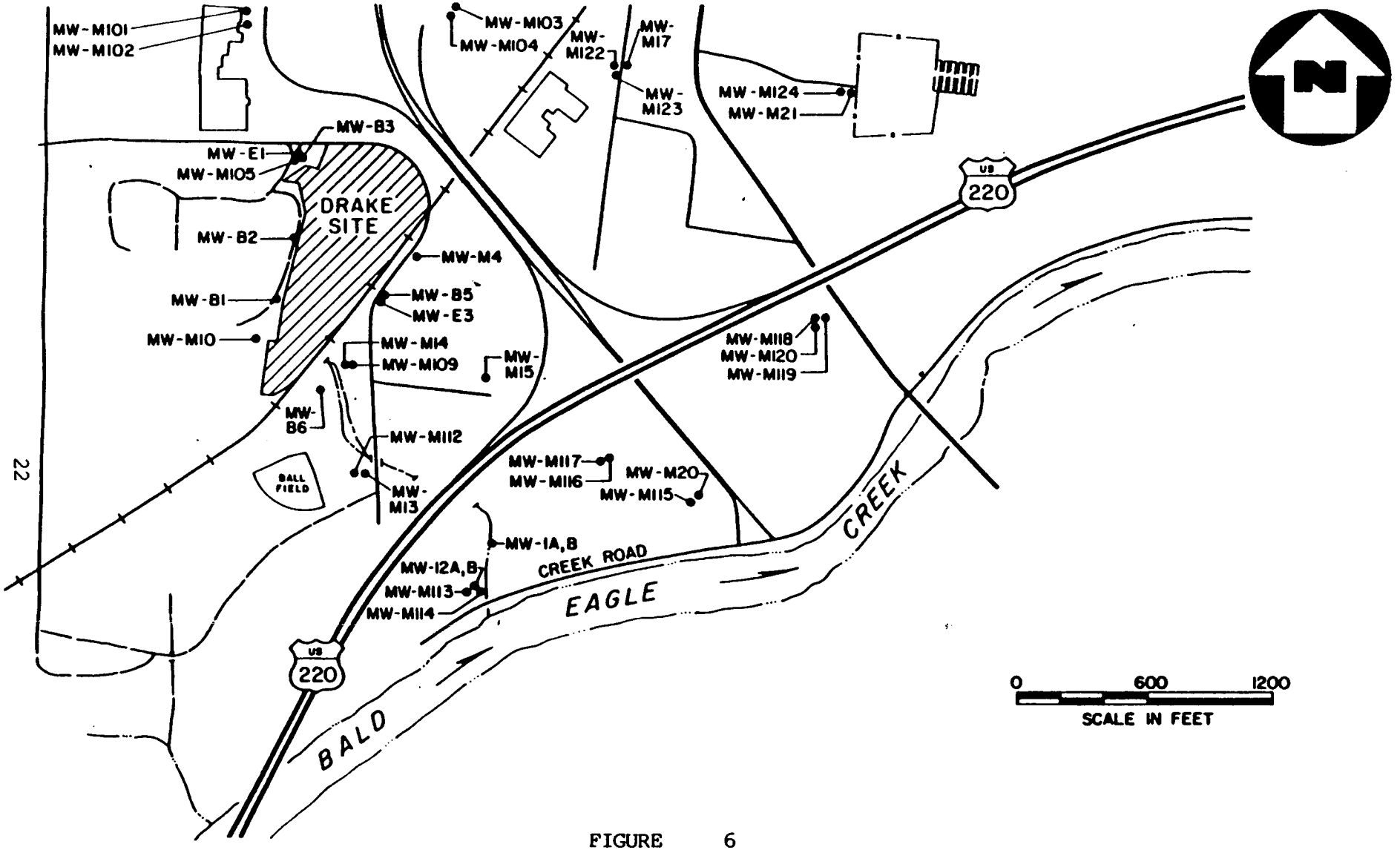


FIGURE 6

OFFSITE GROUNDWATER SAMPLING LOCATIONS
DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA

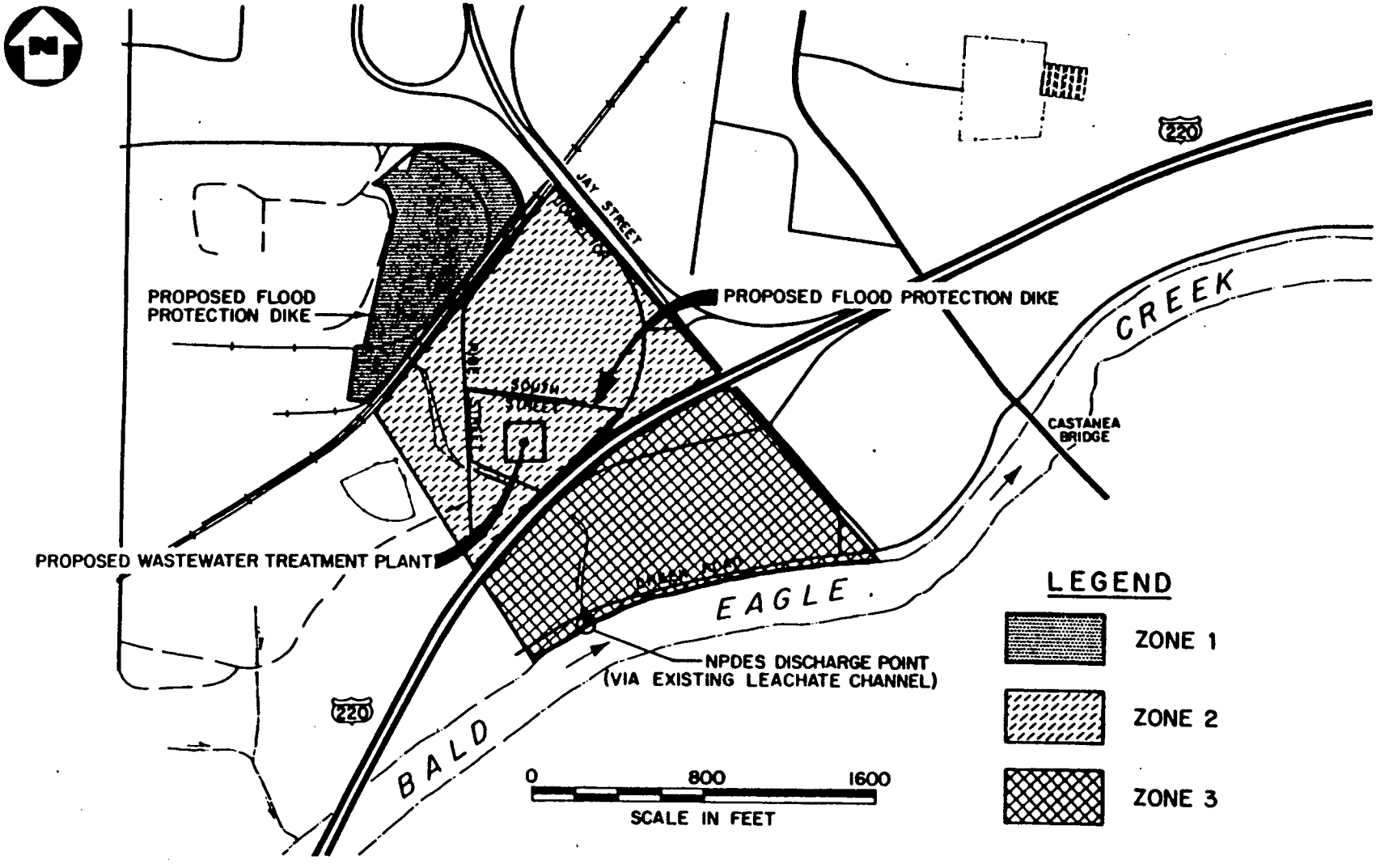


FIGURE 7

GENERAL ARRANGEMENT FOR GROUNDWATER REMEDIATION
DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA

1,2-dichloroethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene in varying amounts. These compounds are detected in the first and the second sampling rounds. In both cases chlorobenzene was detected with the greatest frequency. Solvents including benzene, toluene, and ethylbenzene were also detected.

Offsite groundwater taken from Zone 2 monitoring wells displays the same characteristic organic contamination. Compounds, including benzene, chlorobenzene, 1,2-dichloroethane, tetrachloroethene, and trichloroethene are present in varying amounts.

Samples taken from further downgradient of Zone 3 monitoring wells show that site-related organic contamination is extending toward the Bald Eagle Creek. Consistently, chlorobenzene was detected in both rounds but at lower levels of contamination than 1, 2-dichloroethane. This observation is consistent with the expected contaminant migration pathway in the direction of groundwater flow and the increased mobility in soils of 1, 2-dichloroethane (lower K_{OC} and K_{OW}) over chlorobenzene.

BNAs, Pesticides/PCBs

Table 4 presents the results of base/neutral-acid extractables, pesticides, and PCB analyses obtained from the first and second rounds of groundwater sampling. Samples taken from monitoring wells in all three zones are affected by site-related contaminants. No TCL pesticides or PCBs were detected in any groundwater samples collected throughout the study area. This observation is consistent with results obtained for the soil/sludges (i.e., source materials). Groundwater in the Zone 1 area is contaminated with compounds including 1, 2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, nitrobenzene, 1, 2, 4-trichlorobenzene, phenol, and alkyl and chlorinated phenolics. The compound phenol is detected at the highest level of contamination; however, the concentration is lower than that found in Zone 1 samples. 2,4-Dimethylphenol, 1,2-dichlorobenzene, and 1,4-dichlorobenzene occur with greatest frequency in the first round of samples. No positive results are reported in Zone 2 second round samples.

Only two extractable compounds were detected in Zone 3 monitoring well samples. Bis(2-ethylhexyl) phthalate was detected in four samples at low concentrations and may have occurred as a result of laboratory contamination. The compound 3,3-dichlorobenzidine was detected in only one sample and, since it is an organic dye precursor, may be present as a result of activities at the Drake Chemical Site.

The compounds phenol and 4-chloroaniline were compounds with the highest concentration in the first and second rounds, respectively; however, the frequency of occurrence for any one compound is somewhat inconclusive since all compounds were detected in either one or two samples.

Fenac, B-naphthylamine, Cyanide

Table 1 displays the results of analyses for fenac B-naphthylamine and cyanide obtained from both the first and second rounds of groundwater sampling activities.

Samples taken from monitoring wells in all three zones are contaminated by one or more site-related contaminants. Both rounds of sampling indicate that Zone 1 groundwater is contaminated by both fenac and B-naphthylamine. Cyanide is detected in the first, more comprehensive sampling round but not in the second round samples. Fenac was detected at the highest level of contamination and with the greatest frequency. B-napthylamine was also detected in significant amounts.

Fenac and B-naphthylamine were also detected in offsite, Zone 2, monitoring well samples. Fenac was again found at the highest levels and with greatest frequency. Analytical values for both B-napthylamine and fenac were lower in downgradient Zone 2 samples that those reported in Zone 1. This attenuating effect is consistent with the expected contaminant migration pathway and corresponding diluting effects of uncontaminated groundwater. The compound cyanide was not detected in either round of Zone 2 samples.

Samples taken from downgradient Zone 3 monitoring wells display further dilution in the concentration of fenac, while B-naphthylamine was not detected in any Zone 3 sample. The compound cyanide was detected in a single sample; however, no case can be made for its occurrence as a result of site contamination.

Total Metals

In general, samples acquired from monitoring wells in all three zones demonstrated the presence of metals as would be expected in a geochemical setting. Groundwater in Zone 1 is contaminated with aluminum, arsenic, beryllium, cadmium, chromium, nickel, iron, and vanadium. These compounds are detected in the first sampling round, but not in the more selective second sampling round samples.

The metals aluminum, iron, magnesium, manganese, potassium, and sodium occur at the highest concentrations and with the greatest frequency but do not appear to be site related. Heavy metals, including mercury, lead, barium, cadmium, chromium and cyanide are also detected at varying levels.

Offsite groundwater samples taken from Zone 2 monitoring wells display the same type of contamination present in Zone 1 samples. Again, aluminum, iron, magnesium, manganese, potassium, and sodium occur at the highest concentrations and with greatest frequency but their relationship to the site is not readily discernible. The heavy metals, however, occur in somewhat lower concentrations and cyanide is not detected.

Zone 3 samples show the aluminum, iron, magnesium, potassium, and sodium occur at the greatest concentrations and frequency but the heavy metals seem to increase in concentration with distance from the site, hence, they are probably not site related, as opposed to Zone 2. These trace amounts of metals occur in samples upgradient of the site and may be indigenous to the area and may occur as natural constituents of groundwater.

Antimony and arsenic are also detected in low concentrations in Zone 3 samples but occur with limited frequency. Due to their erratic occurrence and distribution these elements may or may not occur as a result of activities at the site.

PUBLIC HEALTH AND ENVIRONMENTAL ASSESSMENT

Contaminated sludges, soils, and groundwater remain on the Drake Site and adjacent Gorham property. These form a single source that continues to release contaminants to the environment, presenting a potential risk to human health.

Human and environmental receptors that may potentially be exposed to hazardous site associated contaminants are as follows:

- People who may, at some time in the future, reside on or near the site and use site-contaminated groundwater as a source of drinking water or those who currently reside offsite and consume clean groundwater that may be affected by site associated contamination at some future time. No Lock Haven residents use groundwater for drinking purposes.

- Those involved in recreational water activities such as swimming, boating or fishing at the Bald Eagle Creek and downstream Susquehanna River (below the Bald Eagle confluence).

- Those who consume fish taken from both Bald Eagle Creek and below the creek confluence with the Susquehanna River.

- Aquatic flora and fauna in Bald Eagle Creek and the Susquehanna River.

The groundwater beneath the site contains relatively high levels of volatile organics, phenolics, B-naphthylamine, inorganics, and fenac that exceed relevant regulatory standards and/or guidelines established specifically for these compounds. Their presence (especially in Zones 1 and 2) presents significant public health risks to potential groundwater users under several exposure scenarios mentioned above.

The main carcinogenic risks are from B-naphthylamine, 1,2-dichloroethane, vinyl chloride and arsenic. The RI estimates the total carcinogenic risk to be 5.69×10^{-1} if the highest concentrations are combined to form the worst case senario.

The bulk of the risk (Zones 1 and 2) is a result of the presence of organic contaminants, B-naphthylamine, and fenac. As these contaminants migrate away from the site (Zone 3) via groundwater the risks decrease due to the dispersive and adsorptive effects of transport.

Inorganic contaminants including chromium, cadmium, cyanide, and total arsenic are found throughout the study area (Zones 1, 2, and 3) and account for a sizeable portion of risk in Zone 3. Analytical values for these compounds are, however, from total inorganic analyses (i.e., unfiltered sample media). The presence of contaminants such as antimony, lead, cadmium, and nickel are most likely a result of suspended particulate material in the aqueous samples from drilling and well development operations. A clear pattern of inorganic contamination is not evident and may or may not be related to activities at the Drake Chemical Site.

Surface water samples contained inorganic analytes and the compound Fenac. Analytical values for these constituents do not exceed MCLs. The contaminants copper and zinc, however, do exceed the AWOC chronic toxicity values for aquatic organisms. Both zinc and copper occur in upgradient sampling locations and are detected throughout the study area. Their presence in surface waters cannot be attributed specifically to activities at the Drake Site.

COMMUNITY RELATIONS

EPA has been involved in site remediation at Drake Chemical since 1982 when the first removal action occurred and the Agency has always made public announcement of the onsite activities. There was a Community Relations Plan for the entire RI/FS activities since 1983 when the first RI began and these activities have included several public meetings. Specific community relations activities for Phase I and Phase II are outlined in their respective RODs and will not be repeated here. Therefore, this decision document will go over all community relation activities for the third phase of the remedial action selection in this ROD.

The first attempt to select a remedial clean up standard was in the Phase II RI/FS where the technical data was collected and reported in the Phase II RI report. This was made available to the public in March 1986 and copies were placed in the local repositories. The four repositories were located at the Lock Haven City Hall, the Clinton County Commisioner's Office, the Lock Haven Public Library and the Lock Haven University Library. The Phase II FS, however, did not address the soil, sludges and groundwater because no firm decision could be made at that time about the source remediation.

At that time PADER was in the middle of negotiating a consent decree with the neighboring American Color and Chemical facility for a RCRA closure and it was felt that EPA's selected alternative for the soils, sludges and

groundwater should be consistent with the PADER closure requirements. Therefore the Agencies waited until September of 1986 to present the Phase III FS for the soil, sludges and groundwater.

On September 7, 1986, the Agency held another public meeting to present a "preferred alternative" for the site. EPA selected an option which would leave the soil and sludges in place. The "preferred alternative" would be to lower the water table by extraction wells and to place a RCRA type cap to cover the site and prevent further infiltration of water. The public reaction was extremely negative. This reaction prompted the Agency to change its "preferred alternative" to a complete new RCRA type landfill onsite. Then further discussion were held with local officials and PADER. Shortly thereafter, PADER selected its "preferred alternative" which was to excavate the soil and sludges and place them in an offsite landfill. Therefore the agencies disagreed on the location for the proposed containment facility.

This disagreement was not resolved and by October 1986 Congress passed the Superfund Amendments and Reauthorization Act. This new law specifically stated a strong preference for permanent treatment methods and also stated that landfills were the least preferred alternative. The result was to reinvestigate the site and potential treatment technologies which could provide a permanent solution.

The phase III RI and subsequent FS were initiated in January 1987 and have lead to the present set of RI/FS documents which are part of the administrative record and in the local repositories. Throughout this process we have kept the local and State officials informed of our activities and have had some newspaper coverage during the field activities.

EPA's proposed plan was published in an advertisement on August 31, 1988 and included the alternative selected herein. The advertisement in the Lock Haven paper announced the beginning of a 30 day public comment period and a public meeting which was held on September 7, 1988 in Lock Haven. The public meeting was preceded by a meeting with the City and County officials and the minutes from both meetings are attached as part of the Responsiveness Summary.

In general, the community appears to be in agreement with the remedies selected in this ROD and are pleased with the permanent destruction of the soil and sludges. They also are pleased that the site will possibly be available for some other use when the selected remedial actions are completed.

DEVELOPMENT OF REMEDIAL ACTION ALTERNATIVES (RAAs)

During the Phase III FS, remedial technologies were studied to determine which would be applicable to the specific conditions at the Drake Chemical Site. Screening of the technologies was based on data from the Phase III RI and on Applicable or Relevant and Appropriate Requirements (ARARs), as described by the NCP as amended by SARA. ARARs can be loosely defined as requirements of state or federal environmental laws. EPA must ensure that the Superfund response action attains all pertinent state and federal environmental requirements. ARARs applied to the site fall into three broad categories: Contaminant-specific ARARs govern the level of cleanup to be attained. For example, MCLs concern individual substances and identify concentration levels for each that can not be exceeded. Location-specific ARARs are those concerning natural or man-made site characteristics, such as wetlands, scenic rivers, historic districts, and aquifer designations. Of special concern at the Drake Chemical Site are the location of the site in the floodplains of both the Susquehanna River and Bald Eagle Creek and the designation of the groundwater aquifer as a protected potential drinking water supply. ARARs that pertain to the implementation of a particular remedy are action-specific ARARs. Examples include monitoring requirements, effluent discharge limitations, and occupational health and safety requirements. In addition to these considerations, each remedial technology selection must also be guided by an evaluation of the following criteria: short-term effectiveness; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume; ease of implementation; cost; protection of human health and the environment; and acceptability to the state and community.

During the FS, many technologies were evaluated for the Drake Chemical Site. Those that were judged applicable were combined into process schemes, called RAAs. For Operable Unit A, several alternatives were selected for continued consideration. Some are single technology alternatives that have been sufficiently developed and tested so that their use at the Drake Chemical Site should be highly successful. These recommended alternatives for Operable Unit A (Alternatives A-1 and B-1) have the proven ability to treat all contaminant types present at the site for the full range of contaminant concentrations. Other alternatives (Alternatives C-1 and D-1) will require moderate to extensive treatability tests, because they are emerging technologies for hazardous waste applications. The mixture of organic and inorganic contaminants present in the groundwater requires a combination of treatment technologies to achieve treatment goals for Operable Unit B. All the RAAs developed involve groundwater pumping and treating methods, but each RAA features a different secondary treatment step in the wastewater treatment process.

The RAAs considered for Operable Units A and B are described below. For each unit, a No-Action Alternative is considered, as required by law. All of the other RAAs will include flood protection for the soil/sludge treatment unit and the groundwater treatment system.

Operable Unit A - Sludge, Soil, and Sediment RAAs

1) No action with monitoring.

2) A-1 - Excavating all sludges/soils/sediments; treating with rotary kiln incineration; disposing of incinerator ash; backfilling, regrading, and revegetating the site.

3) B-1 - Excavating all sludges/soils/sediments; treating with infrared incineration; disposing of incinerator ash; backfilling, regrading, and revegetating the site.

4) C-1 - Treatment using in-situ vitrification to immobilize contaminants; backfilling, regrading, and revegetating the site.

5) D-1 - Installing injection and extraction wells above the water table for in-situ soil washing, using effluent from the Operable Unit B Wastewater Treatment Plant (WWTP) as a flushing agent, then treating the resulting contaminated wastewater stream.

Operable Unit B - Groundwater RAAs

1) No action with monitoring.

2) Modified RAA-1 - Installing extraction wells; building a treatment plant featuring sand filtration and carbon adsorption; treating extraction stream; discharging effluent; disposing of residuals; monitoring groundwater.

3) RAA-4 - Installing extraction wells; building a treatment plant featuring Biological Activated Carbon (BAC); treating extraction stream; discharging effluent; disposing of residuals; monitoring groundwater.

4) RAA-5 - Installing extraction wells; building a treatment plant featuring sand filtration and ozone/UV; treating and discharging effluent to a Publicly Owned Treatment Works (POTW) for post treatment; disposing of residuals; monitoring groundwater.

5) RAA-5A - Installing extraction wells; building a treatment plant featuring sand filtration, ozone/UV, and activated sludge; treating extraction stream; disposing of residuals and monitoring groundwater.

TABLE 2

Operable Unit A - Summary of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

** NO ACTION WITH MONITORING

- Deed restrictions to prevent direct contact with the source. Possibly install flood protection. Ongoing monitoring.

Short-Term Effectiveness

- Protection will not be achieved.

Long-Term Effectiveness and Permanence

- Situation unchanged. No reduction of existing risk.

Reduction of Toxicity, Mobility or Volume

- None

Implementability

- Groundwater monitoring would be easy to implement and construct

Cost (Present Worth)

- $654,000

Compliance with ARARs

- Does not meet state health department criteria for groundwater quality.

Overall Protection of Human Health and the Environment

- Risk of direct contact with contaminated soils/sludges currently controlled by fence.

- Environmental degradation will increase as leaching from onsite soils/sludges to the groundwater continues.

State Acceptance

- Not acceptable

Community Acceptance

- Not acceptable

TABLE 2 continued

Operable Unit A - Summary Of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

** ALTERNATIVE A1
ROTARY KILN INCINERATION

Short-Term Effectiveness

- 3-5 years to incinerate 252,000 cubic yards.
- Well proven and reliable technology for destruction of organics.
- Protection of community during remedial action will need to be addressed.
- Protection of workers during remedial actions is also needed.

Long-Term Effectiveness and Permanence

- No risk remains associated with organics. Minor risk remains from residuals remaining on site, including metals in the incinerator ash.

Reduction of Toxicity, Mobility or Volume

- Toxicity and volume of essentially all organics destroyed. Metals remain in incinerator ash; volume reduction is minimal. Treatment is irreversible.

Implementability

- Incineration would require special equipment and operators. Residuals require testing to verify treatment.
- Limited treatability testing required.
- Mobile incinerator and specialized operators needed. Not locally available.

Cost (Present Worth)

- $81,284,000
- Operation and Maintenance Costs not applicable

TABLE 2 continued

Operable Unit A - Summary Of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

Compliance with ARARs

- All ARARs will be met or exceeded. EP toxicity or TCLP testing of incinerator ash leachate will be required.

- Compliance with criteria, advisories and guidance. Complies with Federal, state, and local criteria.

Overall Protection of Human Health and the Environment

- Risks of direct contact with contaminated soils, sludges, and dust eliminated by treatment.

- For organics, risk to human health and the environment from groundwater contamination permanently eliminated by treatment of soils/sludges/sediments and groundwater.

- Elimination, reduction or control of risks. For metals in the residual ash leachate, testing is required to determine applicability to use as backfill.

- For offsite incineration, all risks are eliminated.

State Acceptance

- Acceptable

Community Acceptance

- Acceptable

** ALTERNATIVE B1
INFRARED INCINERATION

Short-Term Effectiveness

- Time until protection is achieved. 4-1/2 to 7 years to incinerate 252,000 cubic yards.

- Well proven and reliable technology for destruction of organics. Some treatability testing required.

- Protection of community during remedial actions needed.

- Protection of workers during remedial actions needed.

TABLE 2 continued

Operable Unit A - Summary Of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

Long-Term Effectiveness and Permanence

- No risk remains associated with organics. Minor risk remains from residuals remaining on site, including metals in the incinerator ash.

Reduction of Toxicity, Mobility or Volume

- Toxicity and volume of essentially all organics would be destroyed. Metals remain in the incinerator ash; volume reduction is minimal. Treatment is irreversible.

Implementability

- Incineration would require special equipment and operators. Residuals require testing to verify treatment effectiveness. Commercial technology.

- Limited treatability testing required.

Cost (Present Worth)

- $171,912,000

Compliance with ARARs

- All ARARs will be met or exceeded. EP toxicity or TCLP testing of incinerator ash leachate will be required.

Overall Protection of Human Health and the Environment

- Risks of direct contact with contaminated soils, sludges, and dust eliminated by treatment.

- For organics, risk to human health and the environment from groundwater contamination permanently eliminated by treatment of soils/sludges/sediments and groundwater.

- For metals in the residual ash leachate, testing is required to determine applicability to use as backfill. For offsite incineration, all risks are eliminated.

State Acceptance
- Acceptable

Community Acceptance
- Acceptable

TABLE 2 continued

Operable Unit A - Summary Of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

** ALTERNATIVE C1
IN-SITU VITRIFICATION

Short-Term Effectiveness

- 3 to 11 1/2 years to vitrify 252,000 cubic yards.
- Protection of a community during remedial actions needed
- Protection of workers during remedial actions needed

Long-Term Effectiveness and Permanence

- No risks should remain associated with organics or metals. Treatability testing will be required to confirm.

Reduction of Toxicity, Mobility or Volume

- Essentially all organic toxicity is destroyed through pyrolysis or immobilized, with metals, in the vitrification matrix. Confirmation through treatability testing is required. Treatment is irreversible.

Implementability

- Vitrification would require special equipment and operators. Pilot plant scale for hazardous waste applications.
- Limited excavation and staging operations.

Cost (Present Worth)

- $117,564,000

Compliance with ARARs

- All ARARs will be met or exceeded.
- Compliance with criteria, advisories, and guidance
- Complies with Federal, state, and local criteria.

TABLE 2 continued

Operable Unit A - Summary Of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

Overall Protection of Human Health and the Environment

- Risks of direct contact with contaminated soils, sludges and dust eliminated by treatment.

- Risk to human health and the environment from groundwater contamination permanently eliminated by treatment of soils/sludges/sediments and groundwater.

State Acceptance

- Acceptable

Community Acceptance

- Acceptable

** ALTERNATIVE D1
SOIL WASHING

Short-Term Effectiveness

- Remediation not attained, even in 30 years for B-Napthylamine and metals.

Short term reliability of technology

- Protection of community during remedial actions needed

- Protection of workers during remedial actions needed

Long-Term Effectiveness and Permanence

- Significant risk remains, primarily from B-napthylamine. Residual contamination may contaminate groundwater. Groundwater may be adversely affected by soil additive agents (if required).

- Proper maintenance is very important. Pumps may need replacement.

Reduction of Toxicity, Mobility or Volume

- Residual and volume of some organics removed through soil washing and treated by the WWTP. Insignificant amounts of metals would be removed. Treatment is irreversible.

TABLE 2 continued

Operable Unit A - Summary of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

Implementability

- Most likely implementable for the soils but not the sludges because of hydraulic conductivity considerations. Barrier walls or interceptor trenches may be required to prevent off site migration. Soil additives may be required to enhance the process.

Cost (Present Worth)

- $26,856,000

Compliance with ARARs

- Contaminant-specific ARARs will not be met for certain contaminants in the soil, particularly B-naphthyamine.

- Does not meet state health department criteria for all contaminants.

Overall Protection of Human Health and the Environment

- Risks of direct contact partially reduced by treatment.

- Risk to human health and the environment from groundwater contamination partially reduced by treatment of soils/ sludges/sediments and groundwater.

- Remaining risk primarily due to B-naphthylamine.

State Acceptance

- Not Acceptable

Community Acceptance

- Not Acceptable

TABLE 2 continued

Operable Unit B - Summary Of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

** NO ACTION WITH MONITORING

Short-Term Effectiveness

. Protection will not be achieved.

Long-Term Effectiveness

. Situation unchanged; no reduction of existing risk.

Reduction of Toxicity, Mobility, or Volume

. No amount of hazardous materials destroyed or treated

. No degree of expected reduction in toxicity, mobility or volume

. No type and quantities of residual remaining after treatment

Implementability

. Groundwater monitoring would be easy to implement and construct.

Zone 1, 2 and 3 Pumping Option Costs

. Present worth - $654,000

. Operating and Maintenance costs - $66,000

Compliance with ARARs

. Does not meet state health department criteria for groundwater quality.

Overall Protection of Human Health and the Environment

. No controls.

. Environmental degradation will increase as the groundwater plume spreads.

State Acceptance

. Not acceptable

TABLE 2 continued

Operable Unit B - Summary Of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

Community Acceptance

- Not Acceptable
- Deed restrictions to prevent on site or off site use of contaminated groundwater. Ongoing monitoring.

** ALTERNATIVE M1 - SAND & FILTRATION & CARBON ADSORPTION

Short-Term Effectiveness

- Approximately 30 years for treatment to be completed.
- Well proven and reliable treatment technologies.
- Protection of Workers During Remedial Actions needed

Long-Term Effectiveness

- Existing risk eliminated.
- Excellent long-term reliability based on performance of existi similar systems.

Reduction of Toxicity, Mobility, or Volume

- Toxicity removed from groundwater.

Implementability

- Sizeable undertaking but quite feasible to design, construct and operate treatment.
- Spent granular activated carbon will require regeneration by pyrolysis.

Zones 1, 2 and 3 - Pumping Option Costs

- Present Worth - $26,203,000
- Operating & Maintenance Costs - $1,528,000 (average)

Compliance with ARARs

- All ARARs will be met.
- Complies with state and local criteria and Federal advisories

TABLE 2 continued

Operable Unit B - Summary Of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

Overall Protection of Human Health and the Environment

. Risks to human health and the environment significantly reduced $1x10^{-5}$ risk level, by extraction and treatment of the groundwater.

State Acceptance

. Acceptable

Community Acceptance

. Acceptable

** ALTERNATIVE 4 - BIOLOGICAL ACTIVATED CARBON - (BAC)

Short-Term Effectiveness

. Time until protection is achieved - Approximately 30 years. BAC is expected to have an excellent short-term reliability.

. Treatability testing is required.

. Protection of community during remedial actions needed

. Protection of workers during remedial actions needed

Long-Term Effectiveness

. Reduction of existing risks - Existing risk eliminated.

. Only long-term risk is generation of residue.

Long-Term Effectiveness

. Long-term reliability - Excellent long-term reliability based on performance of existing related systems.

Reduction of Toxicity, Mobility or Volume

. Toxicity removed from groundwater.

Implementability

. Technical Feasibility - Sizeable undertaking but quite feasible to design, extract and operate treatment.

TABLE 2 continued

Operable Unit B - Summary of Comparisons Among Alternatives
Drake Chemical Site, Lock Haven, Pennsylvania

Zones 1, 2 and 3 Pumping Option Costs

- Present worth - $16,079,000
- Operating & Maintenance Costs - $787,000 (average)

Compliance with ARARs

- All ARARs will be met.
- Complies with state and local criteria and Federal advisories.

Overall Protection of human health and the environment

- Risk to human health and the environment significantly reduced to $1x10^{-5}$ risk level, by extraction and treatment of the groundwater.

State Acceptance

- Acceptable

Community Acceptance

- Acceptable

** ALTERNATIVE 5 - SAND FILTRATION AND OZONE/UV

Short-Term Effectiveness

- Time until protection is achieved - approximately 30 years.
- Reliability is expected to be excellent. Treatability testing is required to verify efficiency and design of ozone/UV process.
- Protection of Workers during remedial actions needed

Long-Term Effectiveness

- Existing risk eliminated although some nontoxic organic pollutants may remain, which will be treated by the local POTW.
- Only long-term risk is generation of residue.

Reduction of Toxicity, Mobility, or Volume

- Toxicity removed from groundwater.

Implementability

- Sizable undertaking but quite feasible to design, extract and operate treatment

Zones 1, 2 and 3 Pumping Option Costs

- Present worth $22,874,000
- Operating and Maintenance Costs $ 1,110,000

Compliance with ARARs

- Complies with state and local driteria and Federal advisories.

Overall Protection of human health and the environment

- Risk to human health significantly reduced.

State Acceptance

- Acceptable

Community Acceptance

- Acceptable

Recommended Alternative

After extensive review by EPA and PADER the Agencies have chosen to remediate the soil and sludges by treatment with an onsite mobile rotary kiln incinerator and to remediate the groundwater in Zones 1 and 2 by an onsite water treatment unit featuring the Biological Activated Carbon, The following tasks will be performed as part of the remedial action.

- install necessary flood control measures
- remove aqueous wastes from leachate lagoon area and treat
- install permanent stormwater management controls in the leachate lagoon area and other areas to be excavated
- excavate approximately 252,000 cubic yards of contaminated sludge/soils/sediments and decontaminate using a transportable , onsite, rotary kiln incinerator (The thermal treatment unit must comply with incineration permit requirements including air emissions and monitoring.)
- analyze incinerator ash and use as backfill if acceptable in accordance with State requirements (Further treatment of ash unsuitable for backfill may be necessary for onsite disposal.)
- remove unnecessary obstacles, such as water and sewage lines from the facilities and maintain local lines that are presently in use
- backfill excavated areas with suitable material, regrade to provide positive drainage, and revegetate the topsoil to control erosion
- collect and treat all contaminated water that enters the site (e.g. groundwater, stormwater, and decontaminated water) at the groundwater treatment system
- design and construct and onsite wastewater treatment plant
- install extraction wells in the areas of groundwater contamination within the property boundaries of the former Drake Chemical facilities and in the properties adjacent to the facility in the south and east directions
- pump groundwater to the treatment system

- treat by using Biological Activated Carbon (BAC)

- discharge effluent to Bald Eagle Creek either through the underground conduit constructed for the Phase I leachate stream or through the Lock Haven sewage treatment facility (The water treatment unit must comply with permit requirements for discharge of treated water)

- analyze residuals (e.g. sludgecake) and use as backfill if acceptable in accordance with State requirements (Further treatment may be necessary for onsite disposal.)

This alternative is selected for the soil and sludges onsite because it will provide for contaminants and potential health threats from known carcinogens and other toxic chemicals. The ash will be analyzed for possible metal concentrations which may require further treatment. All acceptable materials will be placed back on the site as fill material after excavation.

The entire site of 12 1/2 acres will be excavated to the water table and will be treated by the thermal treatment unit. The agency has selected this alternative because the chemical analysis has shown that the level of contaminants throughout the site do present a health risk and it is known that some of the specific compounds could be present even if they are no specifically detected by analytical methods. Therefore the entire site which includes the Drake Chemical property and the Gorham property are slated for excavation and incineration.

No specific chemical levels are established because the excavating should continue to the water table where the second portion of the remedy will address groundwater treatment.

The groundwater treatment of Biological Activated Carbon was selected because it has been a proven technology. Also the system will have several components which can address the variety of organic and inorganic contaminants. If the system as proposed is not as effective as required by State or local standards, additional components can be added to the proposed system.

STATUTORY DETERMINATIONS

Protection of Human Health and the Environment

The operable remedial units selected in this ROD are clearly as protective of human health and the environment as possible at this time since permanent destruction of onsite materials will be conducted.

The goal of groundwater remediation would be to meet the current drinking water standards for chemical specified Maximum Contaminant Levels (MCLs) or Maximum Contaminant Level Goals (MCLGs). Again, specific requirements must comply with MCLs at the time of remediation. Since the groundwater remediation may take up to 30 years or longer, the agencies will be required to review the effectiveness of the extraction and treatment system on a periodic basis. At a minimum this review should occur every five years. In this review the agencies must consider the reduction of chemical concentrations for each of the three zones of groundwater and possibly alter the placement of extraction wells or consider any benefits from reinjection of cleaned and treated water which could speed up or help to control the rate of remediation.

Attainment of Applicable or Relevant and Appropriate Requirements (ARARs)

The remedies will meet all ARARs for the federal and state governments and no waivers are required at this time.

Local requirements must also be considered if the Lock Haven POTW is used for the final treatment of the groundwater treatment system.

Some of these requirements will need to have specific chemical standards and will be further defined in the design stage when the permitting requirements are met.

The following table 3 provides a summary of the federal and state ARARs. The primary regulations of concern are RCRA requirements for incinerators, air requirements for incinerator emissions, and NPDES requirements for discharge or local sewage plant pretreatment requirements. Additional requirements are outlined here, but will not supersede any new or more stringent requirements which may be in effect at the time of site remediation.

TABLE 3

Action-Specific ARARs for Operable Units A and B

Requirement	Rationale
FEDERAL	
OSHA Requirements (29 CFR, Parts 1910, 1926 and 1904)	Required for workers engaged in onsite remedial activities
Threshold Limit Values, American Conference of Governmental Industrial Hygenists *	May be appropriate for air concentrations during remedial activities
DOT Rules for Hazardous Materials Transport (49 CFR, Parts 107, 171.1-5000)	Remedial alternatives may include offsite treatment and disposal
Clean Water Act NPDES Permit Requirements	Remedial alternatives may include discharge of effluent to surface waters.
Hazardous Waste Requirements (RCRA Subtitle C, 40 CFR Part 264)	Applicable to treating, storing, and disposing of hazardous wastes.
General Pretreatment Regulations for Existing and New Sources of Pollutants (40 CRF Part 403)	Remedial alternatives may include discharge of effluent to POTW
Federal Manifest for Transport of Hazardous Waste (40 CFR, Part 262)	Hazardous wastes may be transported offsite
Safe Drinking Water Act Underground Injection Control Regulations (40 CFR, Parts 144,145, 146, and 147)	May be appropriate for discharge of effluent to underground waters for soil washing

TABLE 3 (continued)

Requirement	Rationale
STATE	
Pennsylvania Solid Waste Disposal Regulations, PA Code Title 25, Chapter 75	Standard for treating, sorting, and disposing of hazardous wastes
Pennsylvania Pollutant Discharge Elimination System (NPDES) Rules, PA Code Title 25, Chapter 92	Remedial actions may include discharge of effluent to surface waters
Pennsylvania Wastewater Treatment Requirements, PA Code Title 25, Chapter 95	Remedial actions may include discharge of effluent to surface waters
Pennsylvania Industrial Waste Regulations, PA Code Title 25 Chapter 97	Remedial actions may include discharge of effluent to surface waters, or underground waters in the case of soil washing
Pennsylvania Special Water Pollution Regulations, PA Code Title 25, Chapter 101	Applicable for permitted solid waste disposal facilities
Pennsylvania Air Pollution Control Regulations, PA Code Title 25, Chapter 121 through 143	Incineration is considered a potential remedial action
Pennsylvania Storm Water Management Act of October 4, 1978, Act No. 167	Remedial actions may require stormwater management systems
Pennsylvania Erosion Control Regulations, PA Code Title 25, Chapter 102	Soil disturbances during proposed remedial actions may require erosion and sedimentation control measures
Pennsylvania Hazardous Substances Transportation Regulations PA Code Title 25, Chapters 121 - 143	Applicable to waste shipped offsite for analysis, treatment, or disposal

* Criteria, advisories, or other guidelines to be considered (TBCs)

Cost Effectiveness

The remedies have been reviewed for the costs and are cost effective under current technologies.

Utilization of Permanent Solutions

The remedies use permanent solutions for the soils and sludges and will attempt longterm/permanent treatment for the groundwater which will reduce the toxicity, mobility and volume of contaminated sludges, soils and groundwater.

Under current statues the ten year period of groundwater remediation will be part of the selected remedy after which operation and maintenence will begin.

If remediation goals are met, or if no further benefit in The extraction and treatment program can be obtained, the agencies may agree to discontinue the groundwater remediation efforts.

Preference for Treatment as a Principle Element

Incineration is a treatment which can destroy the complex chemical mixtures at the Drake Chemical site and will assure the agencies that the contaminants found in the RI will be removed from the site.

The groundwater treatment is also a proven technology and construction of the multiple systems will allow any necessary additions to assure effective treatment to meet discharge requirements.

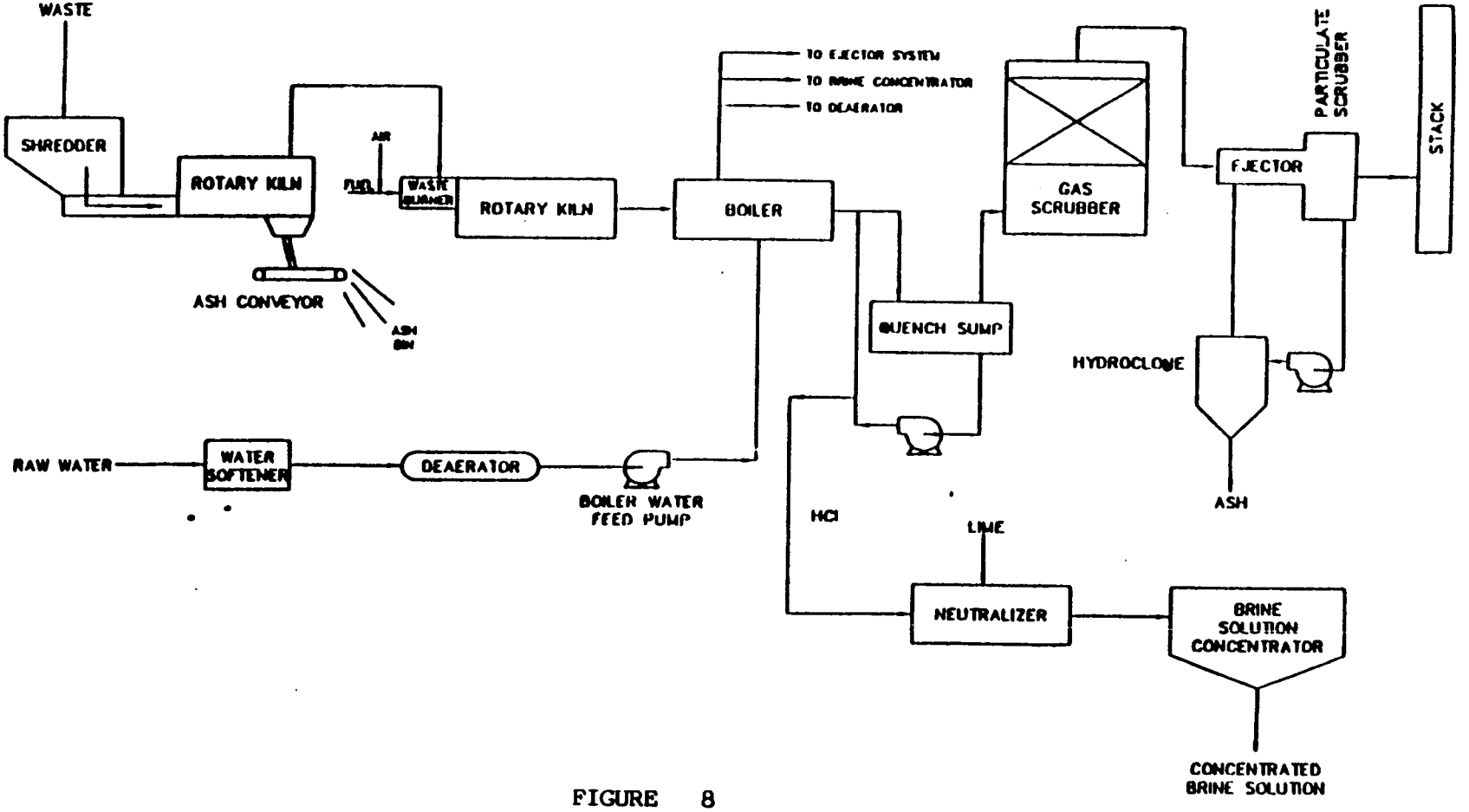
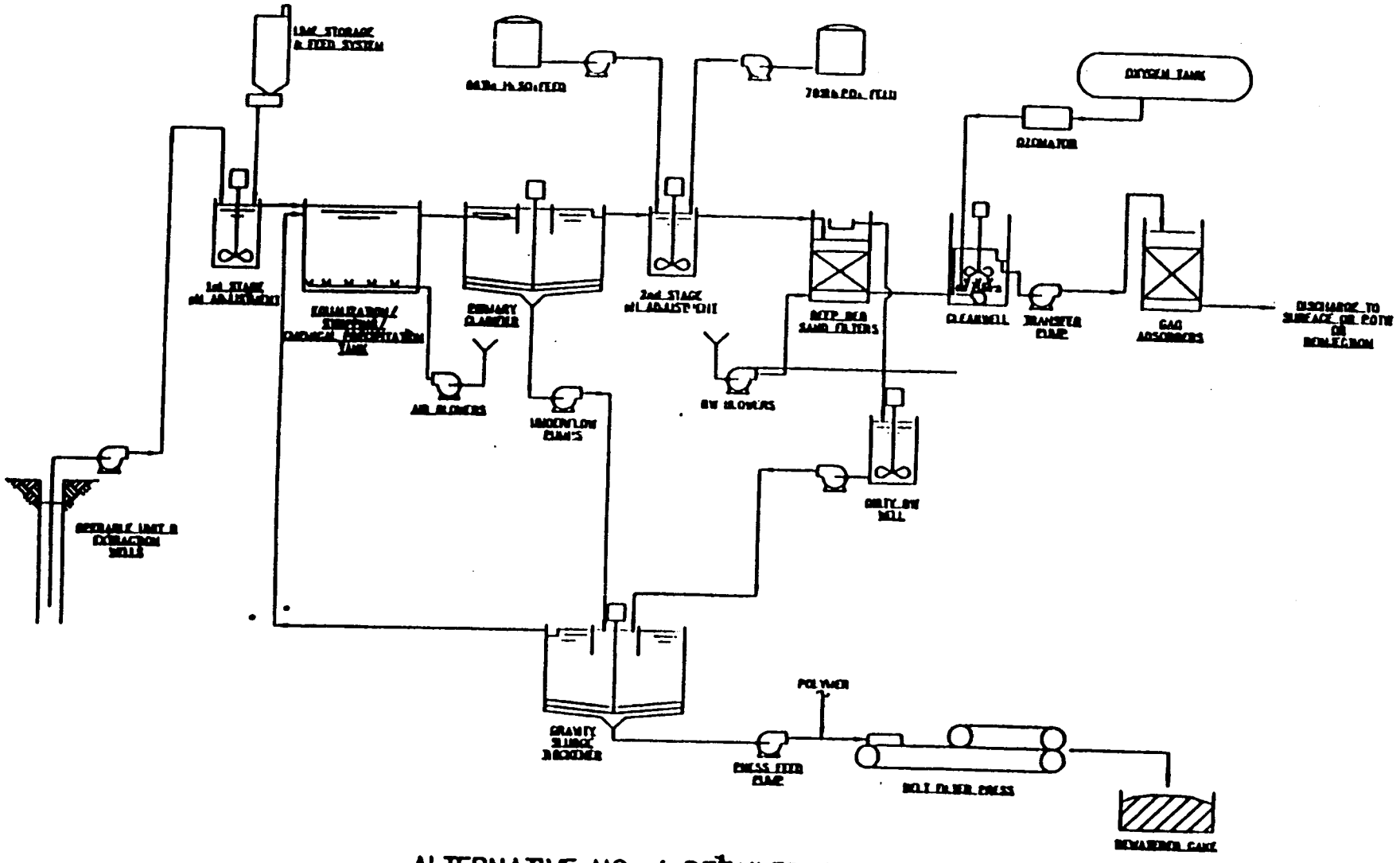


FIGURE 8

OPERABLE UNIT A – ALTERNATIVE A1 DETAILED SCHEMATIC
ROTARY KILN INCINERATION
DRAKE CHEMICAL SITE, LOCK HAVEN, PA



ALTERNATIVE NO. 4 DETAILED SCHEMATIC
BIOLOGICAL ACTIVATED CARBON (BAC)
DRAKE CHEMICAL SITE, LOCK HAVEN, PA

FIGURE 9

FINAL
RESPONSIVENESS SUMMARY

DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA

SEPTEMBER 23, 1988
WORK ASSIGNMENT NUMBER 123-3L31

SEPTEMBER 23, 1988

FINAL
RESPONSIVENESS SUMMARY

DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA

EPA WORK ASSIGNMENT NUMBER 123-3L31
Contract Number 68-01-7250

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DRAKE CHEMICAL SITE
LOCK HAVEN, PENNSYLVANIA

FINAL
RESPONSIVENESS SUMMARY
SEPTEMBER 1988

This Responsiveness Summary documents public concerns and comments expressed during the public comment period. The summary also documents the EPA's responses to the comments and concerns that were received. Information is organized as follows:

1.0 Overview
2.0 Summary of Community Involvement
3.0 Summary of Comments and Responses Regarding the Phase III Feasibility Study
4.0 Other Concerns and Responses
5.0 Remaining Concerns
Attachment:
Community Relations Activities at the Drake Chemical Site

1.0 OVERVIEW

The public comment period for the Drake Chemical Site began on August 30, 1988, and extended to September 28, 1988. To facilitate commenting, EPA briefed community officials in a meeting at Lock Haven City Hall and held a public meeting at Ulmer Planetarium, Lock Haven University of Pennsylvania, on September 7, 1988.

At the meeting, EPA discussed the Phase III feasibility study and presented EPA's preferred remedial alternatives. These alternatives addressed contaminated soils, sludges, sediments, and groundwater contaminated primarily with organics, including fenac; chlorobenzene; 1, 2 dichloroethene, and a variety of other organics associated with the manufacture of dye. The Agency recommended rotary kiln incineration of the soils, sludges, and sediments and disposal of resultant ash on the site by backfilling, covering with clean soil, and then regrading and revegetating the site. The Agency's preferred alternative for groundwater remediation consists of pumping groundwater and treating it with a Biological Activated Carbon process prior to discharging the effluent to local surface waters or to the public sewage treatment facility.

Officials of the Pennsylvania Department of Environmental Resources (PADER) reportedly gave a preliminary indication that the Agency's preferred alternatives may be acceptable to them if agreement can be reached regarding the volume of materials to be excavated and incinerated. Local officials supported the EPA's preferred alternatives but strongly recommended that the Agency consider expanding the municipal sewage treatment facility rather than building a groundwater treatment plant on-site. No comments or concerns were expressed by private citizens or by responsible parties.

2.0 SUMMARY OF COMMUNITY INVOLVEMENT

Lock Haven residents became aware of the Drake Chemical Site as early as 1962 because of numerous fires that occurred at the site. Local officials have interacted closely with EPA and PADER officials since a 1982 EPA emergency action was conducted at the site, following the 1981 closing of Drake Chemical Company. Resident involvement peaked in 1983 when two citizens' groups were active. In early 1983, the Rural Development Committee, expressed concern about several issues, but the group was not heard from thereafter. The second group, CLEAN (Citizens and Laborers for Environmental Action Now) was composed predominantly of former chemical company workers and their families, and its primary goal was to secure health screening for former Drake employees. As a result of CLEAN's efforts, a task force of local doctors, officials, and residents was established, in 1983, to assist the Pennsylvania Department of Health (PADOH) to conduct a medical study. CLEAN apparently became inactive in late 1984 or early 1985. However, following the initial health study, the Centers for Disease Control (CDC), the National Institute of Occupational Safety and Health (NIOSH), and PADOH initiated a long-term study of occupationally-exposed former Drake workers. The study, funded by the Federal Superfund program, is being conducted by the Center for Environmental Epidemiology at the University of Pittsburgh and will extend over a 5-year period. The University reports a satisfactory level of participation in the program.

Several public meetings regarding the Drake Chemical Site have been held since 1982. Over time, public participation has decreased, although local officials have remained actively involved, and the news media has continued its interest and coverage. In addition to local officials and news media representatives, less than 20 residents attended the Phase III public meeting on September 7, 1988.

3.0 SUMMARY OF COMMENTS AND RESPONSES

Virtually all of the comments and responses summarized in this section were made during the briefing of officials on September 7, 1988. One comment, indicated with an asterisk (*), was repeated by an official at the public meeting also held on September 7, 1988.

*1. The primary concern expressed by local officials is the final disposition of groundwater extracted from the site. If EPA elects to send this water to the local sewage treatment plant, the volume of water from the Drake Chemical Site, combined with the volume from the adjacent AC&C facility, may load the plant to capacity and make it impossible to bring in any new industrial clients. Officials strongly suggested that EPA consider expanding the capacity of the municipal plant, instead of building a separate water treatment facility at the site. They suggested that it may be much cheaper to do this and said that the long-range benefits to the community from the municipal facility expansion would be greater than those derived from a facility built on site for relatively short-term use.

EPA Response: EPA has considered both the option of building its own groundwater treatment plant on site and discharging the effluent into Bald Eagle Creek and the option of sending the treated effluent to the municipal sewage plant for finishing. If EPA elects to extract groundwater from only Zone 1, the volume of water extracted will be about 30 gallons per minute (gpm). If groundwater is extracted from Zones 1 and 2, the volume of water extracted will be approximately 60 gpm. EPA does not want to impose on the existing municipal facility and push it to capacity. One advantage of the proposed onsite groundwater treatment plant is that the system can be expanded, as needed.

The Record Of Decision (ROD) will probably recommend either building an onsite groundwater treatment and finishing facility or treating the water at the municipal sewage treatment plant, depending upon which option is most suitable at the time the design is developed. The ROD will be worded to leave either option open.

There are some advantages to using the municipal facility: EPA wouldn't have to secure discharge permits or meet other requirements and EPA wouldn't have to monitor discharge on a regular or long-term basis.

2. Another priority concern for local officials and one which has been raised throughout the remedial program, is the question of property ownership and future use of the site. City officials do not believe that they should have to purchase the property from the court after the Federal government spends money to clean it up. They believe the Federal government should take steps to make it possible for such properties to be returned to local tax bases and that there should be some certification from the Agency regarding the safe future use of such sites. Officials pointed out that many activities, such as warehousing, can be conducted above ground, and the ability to use the property could be meaningful to the city in the future.

   EPA Response: The ownership of the Drake Chemical Site will remain in the bankruptcy estate. After cleanup, the estate has the option to sell the property. Incinerator residuals are likely to be placed on site, and the Agency will consider the site remediated following the proposed actions. Therefore, the property could be used, if someone wanted to buy it. The question is whether anyone would elect to purchase the property, knowing that there will be a 30-year groundwater pumping and treating program in progress and that under SARA the new owner could be held liable, if additional problems are discovered.

3. Officials inquired about the projected remedial schedule and whether there was a waiting period between the soil remediation and the groundwater remediation. One official suggested that a waiting period might make sense as the removal of the soils, in itself, would possibly result in a dramatic reduction in the concentrations of contaminants in the groundwater.

   EPA Response: The excavation and incineration of soils, sediments, and sludges will take approximately 3 to 5 years, and the groundwater remediation will take about 30 years. The 30-year estimate was obtained

by a computer model using the groundwater flow rate and the contaminant concentrations to calculate the time needed to achieve drinking water standards. Although the aquifer in question is not expected to be used as a drinking water supply, the Agency decided to consider it a potential supply source. However, it is possible that the drinking water standard may not be attainable at this site. Consequently, the ROD will require that the goals for groundwater remediation be reevaluated every 5 to 10 years. Groundwater pumping and treating will occur for at least 10 years, if not the entire 30 years currently projected.

It is most likely that groundwater treatment and excavation of soils will begin simultaneously, although it will be easier to design the pumping and treating scheme than to bring in and setup the incinerator. When the two treatment systems are operational, a dramatic lowering of contaminant concentrations will probably occur. The overall project schedule will be affected by the volume of materials to be excavated and by the number of groundwater zones to be pumped.

4. Several officials wanted to know how EPA is going to establish the extent of the cleanup and whether this would be determined before or after the Record of Decision (ROD).

EPA Response: The exact extent of the cleanup has not yet been defined. However, the easiest way to establish cleanup limits would be to set them according to the physical boundary of the site. It would be more difficult to establish cleanup limits according to specific chemical compounds which would necessitate further laboratory testing.

It will be difficult to determine where to stop excavating at the Drake Chemical Site, unless a physical limit is set. Knowing the history of the entire vicinity, many things occurred over the last 50 years that could contribute to contamination, but there is a point where continuing to excavate soils

will cause more damage than good. Also, it is not the intent of this project to keep expanding indefinitely. To whatever extent possible, specific chemical cleanup standards will be tied to the physical limits of the site boundary. At this time, EPA is proposing to excavate the entire 12.5-acre site down to the water table at a depth of 12.5 feet. This represents 240,000 cubic yards of soil.

(An official supported the imposing of a physical limit, saying that it was in the city's interest, as well as the EPA's, to see an end to this project.)

5. Several questions were asked about the type of fuel that will be used to power the incinerator, the volume of ash compared to that of the soils incinerated, and whether metals in the ash, or air emissions from the incineration process, presented risks.

   EPA Response: Because soils do not burn easily, fuel with a high BTU must be used. This fuel will most likely be natural gas which is available at the site. There will not be a dramatic reduction in volume as a result of soil incineration; the ash will represent approximately 80% to 95% of the soil volume.

   There will be some metals in the ash. However, the specific metals that would constitute a hazard are not significant at this site. Cadmium and chromium are present but not in high concentrations. The ash will be tested, and if metals do present a problem, the ash may have to be solidified to prevent the metals from leaching back into the groundwater. Organics are the main concern, and they will definitely be destroyed by incineration.

   Air emissions from the incinerator are not likely to pose a threat to human health or the environment. The incinerator unit will be equipped with scrubbers that will capture particulates in the smoke. Those particulates will then become part of the

residue that will be disposed. The incinerator used at the site will have to meet the same standards that any other incinerator must meet -- 99.99% of all Superfund-list contaminants will be captured.

6. Officials wanted to know whether the State is in agreement with EPA regarding the preferred remedial alternatives and what the State's funding obligation will be, particularly regarding the lengthy groundwater remediation.

   EPA Response: EPA has a preliminary indication from the State that the EPA's preferred alternatives are the options the State would recommend, also. However, the State may not see the need to excavate the entire site and may prefer instead to decrease soil volumes and thus decrease costs. Looking at a list of site-related contaminants, the State finds that the highest concentrations of each of the contaminants are found in certain areas that comprise a much smaller area than 12.5 acres. The health-risk figures will have to be reevaluated to determine whether the scope of the excavation can be reduced.

   EPA and the State will share the cost of the initial remedial work, including soils excavation, extraction well installation, and groundwater treatment facility construction, on a 90/10 basis. The Federal government would also assume 90% of the first 10 years of operation and maintenance costs, while the State would again assume 10%. During the remainder of the remedial effort, the State would assume 100% of operation and maintenance expenses. Operation and maintenance for 20 more years represents an additional $1 million the State will be required obligate.

7. Two officials asked what would happen if cleanup criteria changed during the course of the long-term remedial program or if hot spots are discovered on or off the site during the cleanup period?

   EPA Response: Even if cleanup criteria change, EPA's goal will still be to meet a drinking water standard. EPA may find, after 10 years,

that the kind of contaminant reduction anticipated is not occurring and that a drinking water standard may not be attainable. This will have to be evaluated over time.

If hot spots are discovered within the site area, EPA will probably have the flexibility to address them, particularly if chemical standards are established. It probably will not be possible to attempt to remove a hot spot a mile or two offsite as part of this site remediation, however.

8. An official wanted information about the depth of the aquifer, whether bedrock or soils in the aquifer were contaminated, and whether the soils in the aquifer were sampled.

   EPA Response: The aquifer extends to bedrock which is at a depth of about 90 feet in most locations. Excavation will not be below 12.5 feet, and although there are contaminated soils in the aquifer, most of the contaminants are in the upper portion of the aquifer. Bedrock is not a problem, and it won't be necessary to pump groundwater from the bedrock.

   EPA has taken soil samples from the wells. When groundwater is sampled, filtered and unfiltered samples are collected. When the samples are filtered, the sediments separate and are analyzed, just as the water is analyzed.

9. One official inquired how the site would be affected if a flood occurs before the City of Lock Haven builds the 200-year levy system it is planning. (A 200-year levy is one capable of withstanding a flood of a magnitude that statistically should not occur more than once in 200 years.)

   EPA Response: EPA remedial plans call for a dike to be constructed around the onsite incineration facility and around the onsite groundwater treatment plant sufficient to protect them against a 100-year flood. If the city's 200-year levy is constructed before the

onsite treatment facilities are built, EPA will gain some flexibility in its planning, but the EPA's remedial cost estimates assumed that 100-year dikes will be installed around the treatment facilities. (The official requested the estimated costs for building the onsite dikes. EPA forwarded the information in a letter on September 19, 1988).

10. An official inquired about the possibility that the long-term soil remediation work will create jobs for local residents.

    EPA Response: A large company that owns a mobile incinerator will come in and will, most likely, sub-contract the excavation work. However, any contractors hired will have to be certified under the Occupational Safety and Health Act (OSHA) to work with hazardous wastes.

11. Another official asked if the Phase III design will be done by the Corps of Engineers Baltimore District?

    EPA Response: The design will be done by the Corps' Omaha District and will be implemented by the Baltimore District. Omaha will prepare the bid specifications, and Baltimore will award the contract.

12. An official asked how onsite utility lines will be handled during the soils excavation.

    EPA Response: That is something that can't be answered at this time. It will have to be addressed during remedial design.

13. Several officials remarked that the Phase III preferred alternatives are a significant improvement over earlier proposals.

4.0 OTHER CONCERNS AND RESPONSES

The following concerns and responses were presented during the officials' briefing, September 7, 1988:

1. One official requested an update on Phase II work and an explanation of why the removal of Buildings 1 and 2 was

separated from the removal of other surface structures and debris specified by the Phase II ROD. The official also asked why this separation was not brought to public attention earlier.

EPA Response: The Phase II ROD, signed in 1986, specified the removal of onsite buildings, lagoons, and other scattered debris, and it was determined that these things should be removed before the final Phase III cleanup is initiated. The Phase II removal is now in progress and is occurring under a new Superfund initiative that requires the removal program and the remedial program to work together more closely than required previously. The Drake Chemical Site is the first National Priorities List site in Region III at which EPA's expanded authority under SARA (Superfund Amendment and Reauthorization Act) has been utilized.

The removal of Buildings 1 and 2 was separated from the removal of other surface structures and debris because of the relative complexity involved in removing Buildings 1 and 2, and also because of the contractual mechanisms of the removal and remedial programs. Contractors hired under the removal contract are paid on a time-and-materials basis, whereas contractors for the remedial program are hired at a fixed price. When a project is complicated, it is generally to the Agency's advantage to have a fixed-price contract.

The separation of the Phase II removal tasks was not called out at the time the ROD was signed because EPA had not yet considered doing it that way. The goals of the ROD and the work involved remain the same, although the approach to the work is a bit different.

Removal actions are limited by statute to $2 million dollars and a 1-year duration. At Drake, one exemption to the statute was granted, but Region III did not have all of the requested funds in its 1988 budget. Currently, consideration is being given to expanding the removal contractor's scope of work to include Buildings 1 and 2. This will require another exemption and authorization of additional funds.

2. A number of officials commented that if Buildings 1 and 2 remain on site, the public will not believe that remediation of the site has occurred. These officials believe that it is in everyone's best interest to see that the buildings are included in the current removal action and said that it is important to them to get public recognition for the work that has been done.

   EPA Response: EPA agrees that the public will not perceive that the work has been accomplished if Buildings 1 and 2 stand, and their removal during the current activities is being considered.

3. Several questions were asked regarding work occurring at the adjacent AC&C site which is currently undergoing a RCRA (Resource Conservation and Recovery Act) cleanup. Officials wondered if the AC&C and Drake remedial plans were similar and whether AC&C's plans call for incinerating soils to the extent that soils will be incinerated at the Drake Chemical Site. An official suggested that, if the remedial plans are similar, the two sites might be able to cooperate on the development of treatment facilities.

   EPA Response: Both AC&C and the Drake Chemical Site will use activated carbon to remove organics from the groundwater. The AC&C groundwater treatment system will have a settling basin, but the groundwater treatment system at Drake will have other pretreatment steps that will precipitate metals in the groundwater and then remove organics. Hammermill and AC&C are both located upgradient of Drake and some residual groundwater flow may be occurring. However, with AC&C treating groundwater on one side of the fence, under the State's RCRA program, and EPA treating groundwater on the other, an effective groundwater remediation should occur. EPA and the State will cooperate closely to be sure that all the contaminated groundwater is being captured. AC&C anticipates beginning its groundwater pumping and treating operation in Fall 1988. Pumping and treating at Drake will probably not begin for about 2 years, but there will probably be some overlap in the two programs.

   AC&C will not be initiating a soil incineration plan like the Drake Chemical Site incineration plan. Most of the soils

from AC&C were already excavated and removed to an offsite landfill. What remains is more of a sludge material that can be converted into a liquid slurry and run through a carbon adsorption process. What is present at the Drake Chemical Site is a mixture that resulted from sludge being continually covered with soil for the past 20 years.

5.0 REMAINING CONCERNS

Concerns not conclusively addressed during the comment period include the aforementioned issues:

1. Using Superfund monies to expand the municipal sewage plant, instead of building an onsite groundwater treatment plant.

2. The need for change in the final disposition of remediated Superfund sites, so that they could be returned to the local tax base without the municipalities involved having to purchase them from the bankruptcy estates.

3. The need for a change in Superfund legislation that would protect purchasers of remediated Superfund sites from liability should historic problems re-emerge.

ATTACHMENT

COMMUNITY RELATIONS ACTIVITIES AT THE DRAKE CHEMICAL SITE

Community relations activities conducted to date:

- EPA held a public meeting, in September 1982, to discuss Superfund and the EPA emergency action at the site. Approximately 30 people attended.

- EPA established local information repositories in 1982.

- EPA held a public meeting, in January 1983, to discuss the Remedial Investigation (RI) and the Remedial Action Master Plan (RAMP).

- EPA, PADER, NIOSH, and CDC held a public meeting, in May 1983, to discuss health issues related to contaminants associated with the site. At the meeting EPA presented a slide show covering proposed RI/FS activities, and NIOSH discussed the bladder-cancer risk associated with beta-naphthylamine (fenac) exposure. The meeting was attended by 250 former Drake employees and local residents.

- EPA, PADER, NIOSH, and CDC held a second meeting, in May 1983, to discuss health issues associated with the site. Media coverage was extensive and included a spot on the nationally televised CBS Morning News.

- EPA distributed a fact sheet addressing public concerns raised at the May 1983 meetings.

- EPA held a public meeting, in late 1984, to discuss the Phase I RI/FS.

- EPA held a public meeting, in early 1986, to discuss the Phase II RI/FS.

- EPA held a public meeting, in September 1987, to discuss the status of Phase II work and the Phase III Work Plan. A fact sheet was prepared and distributed at the meeting.

- EPA held a public meeting, in September 1988, to discuss the Phase III FS and Proposed Plan. Copies of the Proposed Plan were prepared and distributed at the meeting.

ORIGINAL

IN RE: DRAKE CHEMICAL : COUNTY OF CLINTON,
: PENNSYLVANIA
SUPERFUND SITE :

TRANSCRIPT OF PROCEEDINGS

EPA PUBLIC MEETING

BEFORE: RAYMOND P. GERMANN, JR., PUBLIC INFORMATION SPECIALIST

EDWARD M. POWELL, ENVIRONMENTAL ENGINEER

ROY SCHROCK, REMEDIAL PROJECT MANAGER

DATE: SEPTEMBER 7, 1988, 7:00 P.M.

PLACE: ULMER PLANETARIUM
LOCK HAVEN UNIVERSITY
LOCK HAVEN, PENNSYLVANIA

MAUREEN L. PRITCHARD, RPR
NOTARY PUBLIC

MR. GERMANN: My name is Ray Germann, and I work for the Environmental Protection Agency, and as most of you know, we are here to discuss the Drake Chemical Superfund Site right down the road, and the ongoing cleanup of that site. And with me to my right is Roy Schrock, he is the Remedial Project Manager and will be doing most of the presentation here tonight. And Marty Powell, who is out at the site right now supervising work that is going on at this time, is here to answer any questions you might have regarding that work.

I am just going to briefly summarize how we have gotten to this point in the project, what we have done in the past, and what we are doing right now. And then Roy is going to do the bulk of the presentation concerning this particular part of the project that we are here to discuss tonight.

The EPA and the State Government got involved in this site way back in the early 1980s when the plant closed down. There was some emergency action taken there because of an immediate threat that was presented by the site. And shortly thereafter, we started the process, long term type process, toward a future permanent cleanup, and we are getting closer and closer to that permanent cleanup as the years go on.

We have basically broken the project down

into three phases. The first phase had to do with a leachate stream which started at the site and ran down through nearby Castanea Township Park and off into Bald Eagle Creek, which is a quarter mile or so from the site. About a year or so ago, we completed a project where portions of that stream were excavated, other portions were covered to make sure that the contaminated groundwater and the contaminated water from that site that was comprised in that stream wasn't available for public exposure, so that the public wouldn't come into contact with it. That was Phase I, and we finished that about a year ago.

A couple years ago, we made a final decision as to what Phase II was going to consist of. And essentially, that is the buildings on site, the lagoons, and other surface debris that you see scattered throughout the site if you look at it from any elevated point. We made a decision to clear all that out before we went for the final solution, which we are here to talk about tonight.

Marty Powell, the on-scene coordinator, is in charge of running that Phase II, which is going on right now, and clearing out that debris, knocking down the buildings, getting rid of basically all that surface mess you see out there. We are hoping for that to be

completed sometime at the end of this year, early next year.

That brings us to Phase III, which is undoubtedly going to be the most time consuming portion of the project. It has to do with cleaning several thousand cubic yards of contaminated soil at the site and the contaminated groundwater beneath the site. We are projecting that the initial construction for that Phase III is going to take several years by itself. And then the follow-up work, to clean the groundwater, which is probably going to be done through a process of pumping it out, cleaning it, and treating it, could take anywhere upward of ten years. So we are not going to be finished with the project anytime soon, by any means, but we are reaching a point of initiating the very last phase.

And with that, I am going to let Roy go into a short discussion of what that last phase consists of.

MR. SCHROCK: The main thing that I want to go over tonight is the pieces of paper over here, the short document which we are calling the Proposed Plan, that is available in the repositories. For anybody here tonight who needs extra copies, we will certainly have more over here.

But what we are doing is basically

informing the public and the local representatives of what EPA is intending to do at the site. We have now completed our third phase of the study. And what this was intended to do was address the soils and sludges onsite, and the groundwater contamination onsite and around the site.

I don't know if many of you were here two years ago, but we also looked at this whole option about two years ago, and at that time we were looking more into either containing it somehow -- I think the actual proposal was to lower the water table and put a cap on it, and we met with pretty much resistance from all the local representatives and commissioners and things like that, who felt it really wasn't a good solution.

Then we decided to think about maybe putting in a landfill. One option was onsite, one option was offsite. We really never came to a good agreement between EPA and the State. So what we really decided, Superfund was reauthorized and required EPA to look into much more permanent solutions, treatment technologies that would take care of the problem. And the least desirable option was to do some kind of landfilling. So that's sort of what prompted us to go back and actually redo our study and look into different ways we might be able to treat and permanently take care of the site.

So what we have done is prepared a whole new set of documents, the remedial investigation and feasibility study. There is a total of seven volumes, and they have sort of a bright blue cover, it sort of looks like this. So if you are ever going into one of the libraries in town or the City Hall or the county courthouse, these are the kind of documents you will be looking for. The most important pieces of those documents are the first volume of the remedial investigation and the first volume of the feasibility study. But rather than requiring or expecting people to read through hundreds and hundreds of pages, we have sort of summarized it in this Proposed Plan so that somebody can take a half hour and be able to understand what it is we thought we were going to look at, and which one of those options we were really going to suggest that we implement.

This meeting is mainly to present the ideas, we are calling this a Proposed Plan, and we do intend to do this, but it isn't a final decision yet, this is still part of the comment period, and I just want to draw your attention a little closer to what we have presented and the ideas we have looked at.

As I said, the purpose of this second Phase III study, looking at the soils and sludges, was to try

and see if we could determine if there were any hot spots that we might be able to limit the treatment to the certain area of the site which would give us the best cleanup without having to deal with the entire site. So what we did is we laid a grid out over the site, pretty much like this drawing would show here (Pointing.) There are some buildings there, so the points underneath the buildings we couldn't look at, but we did with a backhoe dig trenches at each of these locations, and we took three different samples within the trench to try and get an idea, is there a different chemistry on the surface or in the middle or at the bottom part, as well as looking over the entire site, whether there were sections that were much different, or if they were all the same, basically looking for the hot spots that we might be able to limit the amount of soil that needed to be treated.

And what we found, unfortunately, is that we do have contamination throughout the entire site. I will admit that there are areas where the chemicals that we are looking for are in higher concentrations generally below the two surface lagoons where they used to deposit a lot of their sludges and soils in this area, and have a higher level when we look at the comparison of actual numbers. But we also looked at it statistically and felt that there really was not a significant difference

between any of the locations on site.

So unfortunately, that has led EPA back to the position where we are looking at cleaning up the entire site, including about twelve and a half acres, and actually looking at the soil that is contaminated, down to the water table, which is also about twelve and a half feet. So what that sort of boils down to is that we are now thinking about treatment for 240 thousand cubic yards of material. That's quite a bit of material. So a permanent solution is going to take quite a bit of work and quite a bit of money to implement.

The purpose of the feasibility study, which is the second set of documents, is to look at different treatment technologies, to see if we might be able to come up with different ideas how we could treat it, make it a permanently clean site, as well as get an idea of what the cost estimates would be for each of those different kind of alternatives. And in this proposed plan, on page seven, we actually have listed all of the different options we have looked at. We did break it down into two components, the soil/sludges and sediments as Operable Unit A, and the groundwater as a separate operable unit.

I will begin with the soil and sludges and just briefly go over some of the alternatives we looked

at.

Option number one is no action with monitoring. It is required for any of these feasibility studies to really take a good look at what will happen if you do nothing. Sometimes that could be a selective alternative. At this site, however, knowing the history of what we have found before, what we have proposed before, we never really expected to choose a no action alternative. So the second alternative became the one we really were looking at, and then comparing some of the other alternatives to that.

And the first one would be excavating the entire site for 240 thousand cubic yards and using a rotary kiln incinerator to burn materials which would get rid of the organic materials, those which are above the health risk levels, those which are carcinogens of concern, and the burning off would eventually get rid of all that. We would eventually be left with an ash type material which we would expect to be able to put back on the site. So that would require backfilling, covering over the ash material, regrading, and planting some kind of cover on the revegetation.

The cost for this option was about $88 million. We have contacted some private companies which are building mobile incinerators, and we have based our

cost estimates on what they give us. Again, this is something two years ago we really didn't have the option to look at mobile incinerators as closely as we did this time, because they just really hadn't built them yet.

Bringing the incinerator on site will significantly save money, because transportation to an offsite facility is really the most expensive portion of an offsite option.

The second option we looked at closely, number three on this list, would be incineration for using a different kind of incinerator called infrared. Again, it would basically do the same thing, burn the materials, getting rid of the organic materials, and leaving us with an ash, which we could backfill. And the price for this option was about $168 million.

The fourth one on this list was a treatment called in-situ vitrification. This is a process where we would be using basically electrodes in the ground, putting through high volumes of electricity currents, that would actually melt the material and form almost a glass-like substance that we would actually be able to leave in place. The organics would be contained within the glass-like material, and that would prevent anything further going into the groundwater table.

The fifth option on this list is an option

which we looked at as a very different type of approach, which we are calling soil washing. What it entails is pumping the contaminated groundwater out of the ground, treating that so it becomes clean water, recirculating that back on top of the contaminated soils, and letting that percolate down through, and in a sense we would be flushing the soils, trying to extract all of the contaminates that are placed within the soils and sludges onsite.

The total cost for the in-situ vitrification was about $118 million; and this fifth option, the soil washing, was about $27 million.

However, the fifth option, the soil washing, it can be considered something that will actually reduce the toxicity of materials onsite. But it very well may not be what I would call a permanent solution, because it would take an extremely long time to be able to flush out the materials. We are finding that some contaminates are mobile and will leave the soil more readily than others. One of the ones we are most concerned about here are the color die compounds, which are very large molecules, and would tend to be the last materials to be flushed out of the system.

Before I go on to Operable Unit B, I want to interject here that EPA has decided on a preferred

alternative, and that would be for the onsite rotary kiln incineration. If we were to do that, the treatment facility would actually be placed on the site, and the excavation would occur within the fenced in boundaries where we have the site, up to Myrtle Street, along the railroad tracks, and then we would process the materials through the incinerator, onsite, and then the ash would be tested when we are done to see if there are any metals which may be left in the ash -- the metals would not be burned up -- and those ash materials may have to be solidified if we find a high metal content before we can place it back onsite. But in any rate, the idea would to be to make sure that nothing would be leaching out from it that are in concentrations that would affect the groundwater, and ultimately, affect Bald Eagle Creek.

Are there any questions about that piece of the discussion so far, Operable Unit A, on the soils and sediment?

MR. ARDNER: Which plan are you favoring?

MR. SCHROCK: We are favoring option number two, which is labeled as A-1, excavation all sludges/ soils/sediments; treating with rotary kiln incineration.

Again, this is just the comment period. I want to make you feel comfortable that this is the time and the place to be able to think about this option, and

either make your comments at this meeting, or you could write to EPA. There is addresses at the end of this document. But let us know what your feelings are. Maybe there is another option you feel should be looked at, or maybe you would agree and support this alternative.

The second Operable Unit is for the groundwater cleanup. Again, we had to look at a no action with monitoring, but the basic idea here is that EPA will consider that the groundwater table that is at this site could possibly be used in the future if needed for some kind of drinking water source. It certainly could not be used at this time because of level of contamination in the groundwater, but knowing that we are going to consider it a potential source really requires EPA to look at doing some kind of a cleanup to the groundwater at the site. So we have introduced several different technologies which can be used for groundwater treatment.

The thing I want to go over right now doesn't change the alternatives, but it does change the scope of the work which we might be doing. What we have done is, we have divided the groundwater into three different zones. Zone 1, being right underneath the Drake site, and by far that's where the highest concentrations of the contaminates are found.

Zone 2 goes from the border of the Drake site up to Route 220. And in this area we are finding concentrations that are above protective EPA standards that we have looked at to determine what kind of cleanup goals we would want to reach. And we definitely have contamination in there which the agency would be looking at for pumping and treating.

The third zone is outside Route 220 going towards Bald Eagle Creek. We do have one contaminate that shows up in that area which is above EPA protective levels, therefore, we are considering the possibility of pumping and treating in that zone. And the way the feasibility study has looked at it is crossing out each of the three zones.

Overall, the different kind of treatment technologies range somewhere between nine and fifteen million, and we have looked at the different ones that we have. And the agency has decided that what we are calling Operable Unit B, number 3, the RRA-4, the extraction wells, building a treatment plant, which would use biological activated carbon as the primary treatment to get rid of the organic materials in the groundwater. The reason we chose this one is, one, because it is an older proven technology, and it also has the ability that we could add onto the system should we either find we

need additional treatment to be able to clean up the water to the goals that we are going to set, or if we find that we are actually going to be pumping more water than we expected, it has the ability to expand, and it is also a proven technology which has been used for quite a while.

Some of the other ones are using relatively new ideas with sand filtration and ozone/ultra violet kind of treatments to get rid of the organics. But again, the agency is proposing to go with the third alternative shown here, which is RRA-4, the Biological Activated Carbon.

The price for this option when we are looking at just Zones 1 and 2 is about nine million, and to include Zone 3 would be several hundred thousand dollars more, not a significant increase.

At this point, we are thinking we would like to only pump and treat within Zones 1 and 2, because we feel Zone 3 will eventually move into Bald Eagle Creek and that the concentrations will decrease in Zone 3. What reaches Bald Eagle Creek would not be of any concentrations which would affect the fish wildlife in the creek, and would eventually clean itself, and that problem would be solved.

The remaining zones, Zone 1 and Zone 2, we

feel would have a much longer term pump and treat program before we could reach the goals which would basically be a drinking water standard, trying to clean up the water so that some day it possibly could be used as a drinking water supply should it be needed.

One thing I didn't mention that I should do now is that our time frames, I would hope to be able to do both Operable Unit A and B within the same time frame, I would not wait on one before I started the other. The incineration onsite would take between three and five years. The groundwater pumping and treating program would probably take twenty-five to thiry years, based on the goals that we have set for cleanup.

The only other thing I would like to mention is that again, we are still in the selecting process here, and once we have made a decision, this is only a conceptual idea, there is bound to be a number of details which we have not addressed in this plan, which we will have to address, and we will go into what we call a design stage. In that design stage we would probably even make some test ferns to make sure that the incinerators will accept the material. I know we are going to run into boulders and tree stumps and brick walls and things like that. There is going to be some process difficulties in actually getting it into an

incinerator, figuring out how to mix the burning material with the soils that we are going to be putting in, and then also testing the product, the ash, when we are done, to see what kind of metal content that has. That may, as I said before, require us to do some kind of solidification, so that the metals that are left would not leach out into the groundwater table.

As we go further through the document, there are some flow charts that sort of describe what a rotary kiln incinerator is made of. It certainly doesn't give us a picture of it, but it shows some of the steps that we would go through. And also the same is true for the water treatment facility. We would be looking at component parts, each with their own specific area of pretreatment, elimination of organics, and the polishing step at the end.

One thing the agency has not decided completely, we looked at two different options. We may be able to discharge and do the final polishing step of any water we treated to the local sewage treatment plant, or we could build the polishing step as part of our treatment plant, and then meet the MPDES, or the state requirements, for discharge into Bald Eagle Creek. So that is a piece yet we still have to decide. I am going to be working with the local officials, and also, with

our engineers who will be doing the design specifications to work out the details on how that would actually look.

And then beyond that there is a glossary which goes over a lot of the terms. I know this program has a whole lot of acronyms, and I have probably used some of those that you may not be familiar with, but this should help anyone who is trying to read the proposed plan, just to get a better idea on what some of these different technologies might look like, or what the terms would mean as far as EPA and DER are concerned.

Other than that, I really don't have too much more to say. Like I say, the proposed plan is a document by itself. You can take more time to look at it and feel free to write to us or raise any questions that you might have at this time.

MR. HOBERMAN: I am Al Hoberman, Lock Haven City Counsel. And most people know we met today with some of the elected city officials of EPA. And as part of the record today, I would like to encourge you to look seriously at working with the sewage treatment plant in the city of Lock Haven, perhaps adding to the plan as part of this, to treat this water. And we would get a long term benefit to all of the citizens so that at the end of the project we wouldn't have a plant you tore down. And if you just pumped a hundred thousand gallons

a day of basically low BOD water into the plant, all the problems we get would not have any benefits at the end of the treatment process.

So I would encourge you to consider in this planning process the addition of passing the Lock Haven plant, and have something permanent left after the project is done.

MR. SCHROCK: Since we do have Marty Powell here for what we are calling Phase II, demolition of the buildings, I also want to open up the floor for any questions on that part of our work, if you are curious about what he is doing down there, we have the opportunity to ask Marty.

(No response.)

MR. SCHROCK: The only other thing I can think to mention is that we do have copies of the reports in both libraries in town, the one across the street and the Lock Haven Library, there is one at City Hall, and there is also one at the county courthouse in the Commissioners' Office. There is a separate document -- actually it is a set of documents called the administrative record, and that includes all previous studies that we have done, starting back in the early '80s. And I did, just today, put a full set of the administrative records at City Hall with an index and

all. If anybody really wants to get the complete picture, the stack of papers is about as long as this table, but I just want to let you know it is available at City Hall that if somebody should want to go through that much detail, it is there.

MR. ARDNER: Roy, what is the shut off date for comments on Phase II?

MR. SCHROCK: I think it is the 28, I am pretty sure. We would like to make a decision sometime before the end of this month. So the earlier you can get your comments, the better it would be for us to include them and respond to them.

If there is really no further comments, that's all I really came to say, we are going to be here for a few minutes if you have any other kind of questions. Thanks for coming.

(The meeting was concluded at 7:30 p.m.)

I hereby certify that the proceedings and evidence are contained fully and accurately in the notes taken by me on the within proceedings, and that this copy is a correct transcript of same.

Maureen L. Pritchard
Notary Public

My commission expires
September 19, 1988

LAWYER'S NOTES

Page	Line	

DRAKE CHEMICAL SITE
ADMINISTRATIVE RECORD* **
INDEX OF DOCUMENTS

SITE IDENTIFICATION
Preliminary Assessment and Site Inspection Reports

1) Potential Hazardous Waste Site Identification and Preliminary Assessment, 6/13/80. P. 1-4.

2) Memorandum to Mr. Jeffrey Haas, U.S. EPA, from Mr. Duane A. Wilding, U.S. EPA, re: Trip Report of Drake Chemicals International, Inc., 6/18/80. P. 5-12. Two site maps and a Potential Hazardous Waste Site Identification and Preliminary Assessment are attached.

3) Potential Hazardous Waste Site Inspection Report, 8/4/80. P. 13-32. The following are attached:
   a) a Daily Summary sheet from Ecology and Environment, Inc.;
   b) a Summary of Action;
   c) three site maps;
   d) a Drum Inventory of Drake Chemical, Inc.;
   e) three U.S. EPA Chain of Custody forms;
   f) a letter regarding sample data summary sheets.

Hazard Ranking Score Reports

1) Hazard Ranking System, 4/30/82. P. 1-16.

2) Report: Hazard Ranking System Model of Drake Chemical, prepared by Ecology and Environment, Inc., 7/20/82. P. 17-37.

3) Appendix E Model Worksheets, (undated). P. 38-48.

Disposition/National Priorities List Ranking

1) Tentative Disposition, 4/9/81. P. 1-1.

* Administrative Record available 8/31/88.

** Supporting Sampling Data is stored at the Region III Central Regional Laboratory in Annapolis, Maryland.

Note: Company or organizational affiliation is identified in the index only when it appears in the record.

REMEDIAL RESPONSE PLANNING
Work Plans

1) Report: Remedial Action Master Plan, prepared by Roy F. Weston, Inc., 12/9/82. P. 1-84.

2) Report: Work Plan, Remedial Investigation/Feasibility Study of Alternatives, Drake Chemical, Lock Haven, Clinton County, Pennsylvania, prepared by NUS Corporation, 5/83. P. 85-195.

Remedial Investigation/Feasibility Study Reports

1) Report: Remedial Investigation Report (Phase I), Leachate Stream Area, Drake Chemical Site, Lock Haven, Clinton County, Pennsylvania, prepared by NUS Corporation, 3/84. P. 1-242. References are listed on P. 171-176.

2) Report: Remedial Investigation Report (Phase I), Leachate Stream Area, Volume II, Appendices, Drake Chemical Site, Lock Haven, Clinton County, Pennsylvania, prepared by NUS Corporation, 7/84. P. 243-344.

3) Report: Feasibility Study (Phase II), Leachate Stream Area, Drake Chemical, Inc., Site, Lock Haven, Clinton County, Pennsylvania, prepared by NUS Corporation, 7/84. P. 345-461. Two transmittal letters are attached.

4) Report: Remedial Investigation Report (Phase II), Drake Chemical Site, Lock Haven, Clinton County, Pennsylvania, prepared by NUS Corporation, 1/85. P. 462-595.

5) Report: Feasibility Study of Remedial Alternatives (Phase II), Drake Chemical Site, Lock Haven, Clinton County, Pennsylvania, prepared by NUS Corporation, 5/85. P. 596-801.

6) Report: Feasibility Study of Remedial Alternatives (Phase II), Drake Chemical Site, Lock Haven, Clinton County, Pennsylvania, prepared by NUS Corporation, 8/85. P. 802-944.

7) Report: Feasibility Study of Remedial Alternatives (Phase II), Buildings and Contaminated Structures, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 3/86. P. 945-1071. A fact sheet on the Proposed Remedial Alternatives is attached.

8) Report: Feasibility Study of Remedial Alternatives (Phase III), Sludge, Soil, and Groundwater, Drake Chemical Site, Lock Haven, Clinton County, Pennsylvania, prepared by NUS Corporation, 8/86. P. 1072-1221.

9) Report: Feasibility Study of Remedial Alternatives (Phase III), Sludge, Soil, and Groundwater, Appendices, Drake Chemical Site, Lock Haven, Clinton County Pennsylvania, prepared by NUS Corporation, 8/86. P. 1222-1414.

10) Report: Draft Feasibility Study Report Phase IIIA [sic], Volume II, Appendices, Operable Unit A and B, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 7/18/88. P. 1415-1607.

11) Report: Final Phase III Remedial Investigation, Volume I - Narrative, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 8/88. P. 1608-1784. References are listed on p. 1782-1784.

12) Report: Final Phase III Remedial Investigation, Volume II - Appendix A, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 8/88. P. 1785-1826.

13) Report: Final Phase III Remedial Investigation, Volume III - Appendices B, C, D, E, F, and G, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 8/88. P. 1827-2181.

14) Report: Final Phase III Remedial Investigation, Volume IV, Appendices H-1 through H-4, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 8/88. P. 2182-2481.

15) Report: Final Phase III Remedial Investigation, Volume V, Appendices H-5 through H-8, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 8/88. P. 2482-2747.

16) Report: Draft Feasibility Study Report, Phase IIIA, Volume I, Narrative, Operable Units A and B, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 8/9/88. P. 2748-3005. A transmittal letter is attached. References are listed on P. 3004-3005.

Correspondence and Supporting Documentation

1) Letter to Mr. William Hagel, U.S. EPA, from Mr. Richard Ninesteel, NUS Corporation, re: Transmittal of Dioxin Analytical Data, 2/24/84. P. 1-141. The analytical data is attached.

Record of Decision/Enforcement Decision Document

1) Record of Decision, Phase I - Remedial Alternative Selection, 9/30/84. P. 1-38.

2) Record of Decision, Phase II - Remedial Alternative Selection, 4/86. P. 39-71.

EMERGENCY REMOVAL RESPONSE PROJECTS
Operational Documents

1) PolRep #3: CERCLA Removal Project, Drake Chemical Co., Lock Haven, PA, 3/3/82. P. 1-3.

2) PolRep #4: CERCLA Removal Project, Drake Chemical Co., Lock Haven, PA, 3/3/82. P. 4-7.

3) PolRep #5: CERCLA Removal Project, Drake Chemical Co., Lock Haven, PA, 3/5/82. P. 8-10.

4) PolRep #6: CERCLA Removal Project, Drake Chemical Co., Lock Haven, PA, 3/6/82. P. 11-12.

5) PolRep #7: CERCLA Removal Project, Drake Chemical Co., Lock Haven, PA, 3/8/82. P. 13-13.

6) PolRep #9: CERCLA Removal Project, Drake Chemical Co., Lock Haven, PA, 3/9/82. P. 14-16.

7) Report: Safety Plan, prepared by Mr. Jack M. Peterson [sic], 11/12/84. P. 17-43.

8) PolRep #1: Drake Chemical Site, Lock Haven, PA, Emergency Removal Action, 9/2/86. P. 44-44.

9) PolRep #2: Drake Chemical Site, Lock Haven, PA, Emergency Removal Action, 9/3/86. P. 45-45.

10) PolRep #3: Drake Chemical Site, Lock Haven, PA, Emergency Removal Site, 9/4/86. P. 46-46.

11) Site/Safety Protocol, 9/4/86. P. 47-57.

12) PolRep #4: Drake Chemical Site, Lock Haven, PA, Emergency Removal Site, 9/5/86. P. 58-58.

13) PolRep #5: Drake Chemcial Site, Lock Haven, PA, CERCLA Emergency Removal, 9/19/86. P. 59-59.

14) Memorandum to Mr. Jack Downie, U.S. EPA, from Mr. Mike Mazelon re: Trip Report, 9/22/86. P. 60-69. A building locations map, a Hazardous Waste Site Investigation and Emergency Response Safety Plan, and photographs of the chemical transport equipment are attached.

15) PolRep #6 (Final): Drake Chemical Site, Lock Haven, PA, 10/6/86. P. 70-70.

16) Memorandum to File from Mr. Jack L. Downie, U.S. EPA, re: Special Bulletin A, 10/30/86. P. 71-73.

17) Memorandum to Dr. J. Winston Porter, U.S. EPA, from Mr. James M. Seif, U.S. EPA, re: Time extension request for CERCLA Immediate Removal, (undated). P. 74-78. A memorandum regarding a request for exemption from the six-month limitation is attached.

18) Fund Authorization Report, (undated). P. 79-86. A fact sheet is attached.

COMMUNITY INVOLVEMENT

Community Relations Plans

1) Report: Draft Community Relations Plan, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 6/83. P. 1-27.

2) Report: Draft Community Relations Plan, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 9/85. P. 28-59.

3) Report: Draft Community Relations Plan, Drake Chemical Site, Lock Haven, Pennsylvania, prepared by NUS Corporation, 1/86. P. 60-92.

4) Report: The Citizen's Guidance Manual for the Technical Assistance Grant Program, prepared by U.S. EPA, 6/88. P. 93-411.

5) Statement of Work for Community Relations Plans, (undated). P. 412-413.

6) Report: Community Relations Plan for Emergency Action at the Drake Chemical Site, Clinton County, PA (no author cited), (undated). P. 414-417.

7) Handwritten References - Drake CRP, (undated). P. 418-422.

8) Statement of Work - Implementation of Community Relations Plans, (undated). P. 423-424.

Fact Sheets, Press Releases, Public Notices

1) Fact Sheet: Issues Raised at the Public Meeting, 9/6/84. P. 1-1.

2) Fact Sheet: Drake Chemical Site, Lock Haven, Clinton County, Pennsylvania, Sludge and Soil Alternatives, 9/9/86. P. 2-2.

3) Fact Sheet: Preferred Alternative, (undated). P. 3-4.

Meeting Summaries, Trip Reports, Correspondence with the Public

1) Summary of Remedial Investigation and Feasibility Study, 5/83. P. 1-5.

2) Public Meeting Agenda, 5/24/83. P. 6-6.

3) Meeting Attendance List, 5/25/83. P. 7-8.

4) Memorandum to File from Mr. Gil Meyer re: Drake Chemical Site Public Meeting, 6/6/83. P. 9-10.

5) Memorandum to File from Mr. R. M. Ninesteel, NUS Corporation, re: Press conference, 8/17/83. P. 11-11.

6) Work Assignment Cover Sheet, 12/84. P. 12-12.

7) Pre-meeting Attendance List, 9/9/86. P. 13-13.

8) Handwritten Meeting Attendance List, (undated). P. 14-14.

9) File Inventory, (undated). P. 15-15.

10) CRI Planning - First and Second Quarter FY '85, (undated). P. 16-16.

GENERAL GUIDANCE DOCUMENTS *

1) "Promulgation of Sites from Updates 1-4," Federal Register, dated 6/10/86.

2) "Proposal of Update 4," Federal Register, dated 9/18/85.

3) Memorandum to U. S. EPA from Mr. Gene Lucero regarding community relations at Superfund Enforcement sites, dated 8/28/85.

4) Groundwater Contamination and Protection, undated by Mr. Donald V. Feliciano on 8/28/85.

5) Memorandum to Toxic Waste Management Division Directors Regions I-X from Mr. William Hedeman and Mr. Gene Lucero re: Policy on Floodplains and Wetlands Assessments for CERCLA Actions, 8/6/85.

6) Guidance on Remedial Investigations under CERCLA, dated 6/85.

7) Guidance on Feasibility Studies under CERCLA, dated 6/85.

8) "Proposal of Update 3," Federal Register, dated 4/10/85.

9) Memorandum to Mr. Jack McGraw entitled "Community Relations Activites at Superfund Sites - Interim Guidance," dated 3/22/85.

10) "Proposal of Update 2," Federal Register, dated 10/15/84

11) EPA Groundwater Protection Strategy, dated 9/84.

12) Memorandum to U.S. EPA from Mr. William Heckman, Jr. entitled "Transmittal at Superfund Removal Procedures - Revision 2," dated 8/20/84.

13) "Proposal of Update 1," Federal Register, dated 9/8/83.

14) Community Relations in Superfund: A Handbook (interim version), dated 9/83.

15) "Proposal of First National Priority List," Federal Register, dated 12/30/82.

16) "Expanded Eligibility List," Federal Register, dated 7/23/82.

17) "Interim Priorities List," Federal Register, dated 10/23/81.

18) Uncontrolled Hazardous Waste Site Ranking System: A User's Manual (undated).

19) Field Standard Operating Procedures - Air Surveillance (undated).

20) Field Standard Operating Procedures - Site Safety Plan (undated).

* Located in EPA Region III office.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
Post Office Box 2063
Harrisburg, Pennsylvania 17120

Deputy Secretary for
Environmental Protection

(717) 787-5028

September 29, 1988

RECEIVED
OCT 3 1988
Hazardous Waste Management Division
EPA - Region III

Stephen R. Wassersug, Director
Hazardous Waste Management Division
EPA Region III
841 Chestnut Building
Philadelphia, PA 19107

Re: Letter of Concurrence
Drake Chemical Superfund Site, Record of Decision (ROD)

Dear Mr. Wassersug:

The Record of Decision for Phase III of the Drake Chemical Superfund Site has been reviewed by the Department.

The major components of the selected remedy, as described in the Record of Decision, include:

* Excavation of contaminated sludge/soils/sediments and incineration using a transportable, onsite, rotary kiln.

* Pumping of contaminated groundwater to a treatment system utilizing Biological Activated Carbon.

I hereby concur with the EPA's proposed remedy, with the following conditions:

* The Department will be given the opportunity to concur with decisions related to the design of the remedial action to assure compliance with State ARARs.

* EPA will assure that the Department is provided an opportunity to fully participate in any negotiations with responsible parties. .

* The Department will reserve our right and responsibility to take independent enforcement actions pursuant to state law.

* This concurrence with the selected remedial action is not intended to provide any assurances pursuant to SARA Section 104(c)(3).

Thank you for the opportunity to concur with this EPA Record Of Decision. If you have any questions regarding this matter, please do not hesitate to contact me.

Sincerely,

Mark M. McClellan
Deputy Secretary
Environmental Protection