RECORD OF DECISION

Tri-Cities Barrel Superfund Site 704005
Town of Fenton, Broome County, New York

United States Environmental Protection Agency
Region II
New York, New York
March 2000

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Tri-Cities Barrel Superfund Site
Town of Fenton, Broome County, New York

Superfund Site Identification Number: NYD980509285
Operable Unit 1[1]

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's selection of a remedy for the Tri-Cities Barrel Superfund Site (the "Site"), which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §9601 *et seq.* and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the selection of the remedy is based.

The New York State Department of Environmental Conservation was consulted on the planned remedy in accordance with CERCLA Section 121(f), 42 U.S.C. §9621(f), and it concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The major components of the selected remedy include the following:

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[1] This response action applies a comprehensive approach; therefore, only one operable unit is required to remediate the site.

- Excavation and/or dredging of approximately 50,000 cubic yards of unsaturated (above the water table) soil and sediment exceeding soil/sediment cleanup objectives[2];

- Backfilling of the excavated areas with clean fill and revegetating such areas, as appropriate. All excavated/dredged material will be characterized and transported for treatment/disposal at an off-site Resource Conservation and Recovery Act- and/or Toxic Substances Control Act- compliant facility, as appropriate;

- Restoration of any wetlands impacted by remedial activities. The restored wetlands will require routine inspection for several years to ensure adequate survival of the planted vegetation;

- Extraction of contaminated groundwater utilizing a network of recovery wells, and treatment of the extracted groundwater (by air stripping, liquid phase carbon adsorption, and chemical precipitation technologies, or other appropriate treatment), followed by discharge to surface water;

- Implementation of institutional controls (*i.e.*, deed restrictions) to prohibit the installation and use of groundwater wells at the Site until groundwater cleanup standards are achieved;

- Long-term monitoring of groundwater, surface water, and nearby residential private wells to ensure the effectiveness of the selected remedy.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. §9621, in that it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants, which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment (or resource

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[2] Three distinctive locations on-site contain "principal threat waste" because the soil contaminants in these areas are highly mobile or toxic and will be a continuing source of groundwater contamination where such contamination is located below the water table. These "principal threat waste" soils will be excavated to the water table; contamination below the water table will be addressed through the groundwater portion of the remedy.

recovery) technologies to the maximum extent practicable. In keeping with the statutory preference for treatment as a principal element of the remedy, the contaminated groundwater will be collected and treated. In addition, the excavated soil/sediment will be treated, as necessary, at an off-site facility prior to disposal.

This remedy will result in the reduction of hazardous substances, pollutants, or contaminants on-site to levels that will permit unlimited use of and unrestricted exposure to the Site. However, because it may take more than five years to attain cleanup levels in the groundwater, a Site review may be conducted within five years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this site.

- Chemicals of concern and their respective concentrations (see ROD, pages 5-9);
- Baseline risk represented by the chemicals of concern (see ROD, pages 10-16);
- Cleanup levels established for chemicals of concern and the basis for these levels (see ROD, pages 5 and 7 and Appendix II);
- How source materials constituting principal threats are addressed (see ROD, page 9);
- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see ROD, page 10);
- Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see ROD, page 35);
- Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see ROD, pages 34-35); and

- Key factors that led to selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (see ROD, pages 33-39).

AUTHORIZING SIGNATURE

Jeanne M. Fox
Regional Administrator

3/31/00
Date

RECORD OF DECISION FACT SHEET
EPA REGION II

Site

Site name:	Tri-Cities Barrel Site
Site location:	Town of Fenton, Broome County, New York
HRS score:	44.06
Listed on the NPL:	October 4, 1989

Record of Decision

Date signed:	March 31, 2000
Selected remedy:	Excavation/dredging of contaminated soils and sediments, followed by off-site treatment/disposal, and extraction and on-site treatment to address the contaminated groundwater.
Capital cost:	$18,677,000
Monitoring cost:	$137,000, annually
Present-worth cost:	$20.4 Million (7% discount rate for 30 years)

Lead EPA

Primary Contact:	Young Chang, Remedial Project Manager, (212) 637-4253
Secondary Contact:	Joel Singerman, Chief, Central New York Remediation Section, (212) 637-4258

Main PRPs See ROD Appendix V-c

Waste

Waste type:	Volatile organics, semi-volatile organics, metals, pesticides and PCBs
Waste origin:	Hazardous industrial waste remaining in drums that were sent to the Site for reconditioning
Contaminated medium:	Groundwater, soil, and sediments

DECISION SUMMARY

Tri-Cities Barrel Superfund Site
Town of Fenton, Broome County, New York

United States Environmental Protection Agency
Region II
New York, New York
March 2000

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ATTACHMENTS

SITE NAME, LOCATION, AND DESCRIPTION

The 14.9-acre Tri-Cities Barrel Site[1] (the "Site") is situated adjacent to Old Route 7, approximately five miles northeast of the City of Binghamton, in the Town of Fenton, Broome County, New York. The Site is bordered to the north by Osborne Creek and by rural residential areas, farmland, and woodlands on the other sides. (See Figure 1-1.)

For investigation and remediation purposes, the Site, which is bisected by Interstate-88 (I-88), has been divided into three areas—"North of I-88"; "South of I-88"; and "South of Osborne Hollow Road." The 5.1-acre "North of I-88" section is bordered to the north by Osborne Creek and to the south by I-88. The 6.9-acre "South of I-88" area spans from I-88 to Osborne Hollow Road at the south. The "South of Osborne Hollow Road" section, which includes approximately 2.9 acres, is bordered to the north by Osborne Hollow Road and to the south by railroad tracks. The layout of the Site is presented in Figure 2-1.

The former operational portion of the Site[2] occupies approximately 3.5 acres within the "South of I-88" area. The former operational portion included a process building, pole barn, garage, barrel burner, two aboveground oil storage tanks, four aboveground propane tanks, two underground fuel tanks, numerous empty and partially full drums, and miscellaneous tools and equipment.

The southern portion of the Site is relatively flat, except in the vicinity of I-88, where the ground surface slopes steeply down to the highway. North of I-88, the ground surface slopes downward gradually northward toward Osborne Creek. In the vicinity of Osborne Creek, the ground surface slopes downward steeply to the creek and the associated flood plain. The elevation of the Site ranges from 930 feet (at Osborne Creek) to 1,025 feet above mean sea level (south of Osborne Hollow Road).

Two small unnamed, intermittent streams parallel the eastern and the western sides of the Site. The eastern tributary is located outside the property boundary; the western tributary is located within the property boundary. Both streams collect the surface water runoff from the southern portion of the Site, including Osborne Hollow Road, Old Route 7, and the railroad tracks. Both of the streams flow north, discharging to Osborne Creek.

A man-made pond (a former lagoon) located north of I-88 occupies approximately 6,000 square feet. However, the size of the pond varies greatly with seasonal precipitation, and is often dry or nearly dry during

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[1] Superfund Site Identification Number: NYD980509285.

[2] The property was a former industrial facility.

the summer months; the pond is at its deepest (2-3 feet) during the spring. Currently, the pond receives water from precipitation directly into the pond and storm water runoff from I-88 and the area between I-88 and the pond.

The United States Environmental Protection Agency (EPA) is the lead agency for this site; the New York State Department of Environmental Conservation (NYSDEC) is the support agency. The investigatory and removal work at this site was performed by the potentially responsible party (PRP) Group under administrative orders on consent with EPA.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Tri-Cities Barrel Site was operated by Francis Warner and subsequently by his son Gary Warner as a barrel and drum (hereinafter "drum") reconditioning facility from about 1955 to 1992. The Tri-Cities Barrel Co., Inc., a defunct corporation of which Gary Warner was the most recent president, owned the property during this period of operation, and continues to be the owner.

The drum reconditioning process involved cleaning and reconditioning the interior and exterior of drums through a combination of physical, chemical, and mechanical means. The drums, which were brought to the Site from numerous different sources, typically contained residues of a variety of chemical compounds employed in industrial or commercial operations. Depending on the nature of the residues, Tri-Cities Barrel Co. employed various processes to remove such residues, including water and caustic sodium hydroxide solutions, incineration, particle blasting, and scraping. Following cleaning, if necessary, the drums were reformed and repainted. Reconditioned drums were staged in box trailers or outdoors, east of the process building. Much of the available property South of I-88 was used for drum storage. As many as 1,000 drums per week were reconditioned at the facility.

From the beginning of the facility's operations to the early 1960s, liquid wastes from the reconditioning process were discharged to the ground and allowed to flow downslope toward Osborne Creek. This practice created a distinctive drainage pattern (see Figure 3-1). From the early 1960s to 1980s, liquid wastes were discharged into a series of unlined lagoons on the Site. These lagoons were reportedly three to four feet deep. Prior to the completion of construction of I-88 in 1968, there were five lagoons located north of the former process building that were aligned along a north-south line in the same general area as the earlier discharge pattern. After the construction of I-88, the liquid wastes were directed from east to west across the Site through the lagoons. The discharge from these lagoons flowed to the western tributary.

Tri-Cities Barrel Company discontinued its practice of discharging liquid wastes to the lagoons in 1980 after negotiations with NYSDEC. By 1981, the three lagoons south of I-88 had been backfilled with approximately 7,000 cubic yards of fill. Following the closure of the lagoons, the liquid wastes generated in the drum cleaning process were collected in a holding tank and hauled off-site for disposal. Upon installation of a closed-loop wastewater recirculating system, only infrequent off-site disposal of the liquid wastes was necessary.

Drum reconditioning operations ceased at the facility in 1992, in accordance with an agreement between the PRP Group and Gary Warner. During 1992 and 1993, the property was used by Tri-Cities Barrel Co. to broker clean drums that were brought in by the company from off-site sources, and to sell the existing inventory of empty, clean plastic drums.

Based upon the results of an EPA-performed site investigation and New York State-performed Phase I and Phase II site investigations, the Site was added to the National Priorities List on October 4, 1989.

A PRP search conducted by EPA in 1991 resulted in the initial identification of 23 PRPs for the Site. In May 1991, EPA notified these parties that it considered them PRPs with respect to the Site, and provided those parties with the opportunity to perform a remedial investigation and feasibility study (RI/FS) for the Site under an Administrative Order on Consent (AOC).

On May 14, 1992, EPA entered into an AOC with 14 of these parties, under which they agreed to perform an RI/FS to determine the nature and extent of the contamination at and emanating from the Site and to identify and evaluate remedial alternatives.

Following issuance of the RI/FS AOC, EPA continued its PRP investigation and, in August 1995, notified 64 additional parties of their potential responsibility at the Site. Thirty-one of these parties were determined by EPA to be parties with a minimal, or *de minimis* share of liability, and were offered participation in a *de minimis* settlement. Of those 31 parties, 26 elected to settle their liability with EPA as respondents in an AOC in March 1996. Three more *de minimis* parties settled with EPA in an AOC in July 1997.

On September 25, 1996, the PRP Group and EPA entered into an AOC whereby the PRP Group agreed to perform a removal action at the Site under EPA oversight. EPA then issued a Unilateral Administrative Order in December 1997 to eight nonconsenting parties, directing them to participate in the removal action along with the AOC parties. The objectives of this action were to locate, characterize the contents, and properly dispose of all containers, drums, tanks, and debris located on-

site and decontaminate, demolish, and dispose of all buildings and structures. This work was completed in January 1997. Other than the wastewater recirculating system, which was decontaminated, the Site is currently vacant.

The RI and FS reports, completed by the PRP Group pursuant to the 1992 AOC, were delivered to EPA in May and August 1999, respectively.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report, FS report, and Proposed Plan for the Site were made available to the public in both the Administrative Record and information repositories maintained at the EPA Docket Room in the Region II New York City office and the information repository at the Fenton Town Hall, 44 Park Street, Port Crane, New York. A notice of availability for the above-referenced documents was published in the *Press and Sun Bulletin* on January 22, 2000. A public comment period was held from January 21, 2000 to February 19, 2000.

On February 9, 2000, EPA conducted a public meeting at the Chenango Valley High School Auditorium to present the findings of the RI/FS and answer questions from the public about the Site and the remedial alternatives under consideration.

In response to separate inquiries by EPA and the PRP Group regarding the Site's reasonably-anticipated future land use, the Town of Fenton Town Board indicated in an August 23, 1999 resolution and a November 2, 1999 letter from Donald F. Brown, Town Engineer, Town of Fenton, to Jack Spicuzza, the PRP Group's technical representative, that the current residential/agricultural zoning would not change. At the public meeting, representatives from EPA solicited a wider cross-section of community input on the reasonably-anticipated future land use of the property and potential future beneficial groundwater uses at the Site.

Responses to the comments received at the public meeting and in writing during the public comment period are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively

addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the Site. Operable units may address geographical portions of a site, specific site problems, or initial phase of an action, or may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site.

This response action applies a comprehensive approach; therefore, only one operable unit is required to remediate the Site. The primary objectives of this action are to control the sources of contamination at the Site, to minimize the migration of contaminants, and to minimize any potential future health and environmental impacts.

SUMMARY OF SITE CHARACTERISTICS

The purpose of the RI, conducted from 1992 to 1997, was to determine the nature and extent of the contamination at and emanating from the Site. The results of the RI are summarized below.

Surface and Subsurface Soils

The identification of contaminants of concern (COCs) was based on the RI's analytical results and the risk assessment. Since New York State has not promulgated cleanup standards for soil, preliminary remediation goals (PRGs) were selected for each of the constituents of concern. The PRGs are derived from a variety of sources, including NYSDEC *Technical and Administrative Guidance Memorandum No. 98-HWR-4046* (TAGM) objectives, site background, and site-specific risk-based calculations.

Area North of I-88

In this area, COCs exceeding PRGs were detected in the top two feet of the soils and sediments within the boundaries of the former lagoon and the former surficial discharge drainage pattern. The contaminants are predominantly semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and pesticides. The most prevalent SVOC and its corresponding maximum detected concentration was bis(2-ethylhexyl)phthalate at 31 milligrams per kilogram (mg/kg). The maximum concentrations of the pesticides, heptachlor, dieldrin, alpha-chlordane, and gamma-chlordane, were detected at 0.099 mg/kg, 0.47 mg/kg, 0.66 mg/kg, and 0.12 mg/kg, respectively. The maximum concentration of PCBs was detected at 33 mg/kg. The maximum concentration of metals,

manganese, sodium, and zinc were 2,230 mg/kg, 751 mg/kg, and 686 mg/kg, respectively.

It is estimated that 2,900 cubic yards (cy) of soils exceed the PRGs in this area. (See Figures 4-1 and 4-2.)

Area South of I-88

Approximately 3.9 acres of the top two feet of soil in the Area South of I-88 is contaminated with volatile organic compounds (VOCs), SVOCs, pesticides, PCBs, and metals. The most prevalent VOCs and their corresponding maximum concentrations detected were toluene (210 mg/kg), ethylbenzene (120 mg/kg), xylene (640 mg/kg), tetrachloroethene (120 mg/kg), vinyl chloride (14 mg/kg), 1,1,1-trichloroethane (35 mg/kg), 1,1-dichloroethane (26 mg/kg), and 1,2-dichloroethene (1,100 mg/kg). The SVOCs and their corresponding maximum detected concentrations were indeno(1,2,3-cd)pyrene (28 mg/kg), phenol (120 mg/kg), dibenzofuran (41 mg/kg), diethyl phthalate (80 mg/kg), fluorene(77 mg/kg), phenanthrene (190 mg/kg), anthracene (35 mg/kg), di-n-butyl phthalate (8.8 mg/kg), fluoranthene (120 mg/kg), pyrene (120 mg/kg), benzo(a)anthracene (64 mg/kg), chrysene (67 mg/kg), bis(2-ethylhexyl)phthalate (13,000 mg/kg), benzo(b)fluoranthene (30 mg/kg), benzo(k)fluoranthene (19 mg/kg), benzo(a)pyrene (65 mg/kg), and di-benzo(a,h)anthracene (17 mg/kg). The pesticides and their corresponding maximum concentrations detected were heptachlor (36 mg/kg), aldrin (0.64 mg/kg), dieldrin (65 mg/kg), endrin (0.75 mg/kg), alpha-chlordane (300 mg/kg), gamma-chlordane (400 mg/kg), 4,4-DDD (8.5 mg/kg), and 4,4-DDT (4.3 mg/kg). The maximum total PCB concentration detected was 169.9 mg/kg. The primary metals and their maximum concentrations were antimony (137 mg/kg), barium (1,210 mg/kg), chromium (1,610 mg/kg), lead (8,540 mg/kg), silver (39.6 mg/kg), sodium (853 mg/kg), and zinc (1,980 mg/kg).

The subsurface soil (at varying depths) in this area is also contaminated with VOCs, SVOCs, pesticides, PCBs, and metals. The most prevalent VOCs and their corresponding maximum concentrations detected were toluene (990 mg/kg), ethylbenzene (370 mg/kg), xylene (460 mg/kg), 4-methyl-2-pentanone (32 mg/kg), tetrachloroethene (260 mg/kg), 1,1,1-trichloroethane (4.8 mg/kg), 1,1-dichloroethane (280 mg/kg), and trichloroethene (7,000 mg/kg). The SVOCs and their corresponding maximum detected concentrations were 1,2-dichlorobenzene (150 mg/kg), 2-methylphenol (1.5 mg/kg), 4-methylphenol (4 mg/kg), 1,2,4-trichlorobenzene (240 mg/kg), 2,4,5-trichlorophenol (0.39 mg/kg), diethyl phthalate (28 mg/kg), chrysene (1.6 mg/kg), bis(2-ethylhexyl)phthalate (3,000 mg/kg), benzo(b)fluoranthene (1.9 mg/kg), and benzo(a)anthracene (1.4 mg/kg). The pesticides and the corresponding maximum concentrations detected were heptachlor (1.5 mg/kg),

endosulfan I (170 mg/kg), dieldrin (80 mg/kg), alpha-chlordane (27 mg/kg), gamma-chlordane (30 mg/kg), 4,4-DDD (200mg/kg), and 4,4-DDE (480 mg/kg). The maximum PCB concentration detected was 3,600 mg/kg. The primary metals and their maximum concentrations were barium (501 mg/kg), lead (3,510 mg/kg), mercury (40.2 mg/kg), silver (32.4 mg/kg), sodium (1,230 mg/kg), and zinc (3,800 mg/kg).

It is estimated that a total of 44,500 cy of soils exceed the PRGs in the Area South of I-88. (See Figures 5-1 through 5-12.)

Area South of Osborne Hollow Road

COCs and their corresponding maximum detected concentrations in the surface soils in this area are bis(2-ethylhexyl)phthalate (7 mg/kg) and endrin (0.12 mg/kg). In the subsurface soils, only bis(2-ethylhexyl)phthalate was detected at 2.6 mg/kg.

Based on the data, the COCs which exceed the PRGs are restricted to approximately the top 3 feet (in several locations).

It is estimated that 230 cy of soils exceed the PRGs in this area. (See Figure 6-1.)

Tables 1-1 through 3-1 in the Appendix II summarize surface and subsurface soil data exceeding Applicable or Relevant and Appropriate Requirements (ARARs).

Sediments

Eastern Tributary

Although eastern tributary sediments show levels of SVOCs, pesticides, PCBs, and metals which exceed NYSDEC's sediment criteria (Division of Fish and Wildlife, Division of Marine Resources, *Technical Guidance for Screening Contaminated Sediments*, January 1999), with the exception of alpha- and gamma-chlordane, it is believed that the contaminants are not attributable to the former site operations, but to an adjacent former junkyard. The maximum concentrations detected for alpha- and gamma-chlordane were 0.033 mg/kg and 8.7 mg/kg, respectively.

Based on the data, approximately 780 cy of sediments exceed the sediment criteria.

Western Tributary

The levels of SVOCs, pesticides, PCBs, and metals in this area exceed the sediment criteria. The highest concentration of total SVOCs detected was 111.8 mg/kg. Seven different pesticides were detected at

concentrations exceeding the sediment criteria, of which alpha- and gamma-chlordane were the most prevalent. The maximum concentrations detected for alpha- and gamma-chlordane were 4.6 mg/kg and 6 mg/kg, respectively. The maximum PCBs concentration detected was 10 mg/kg. The highest concentration of the chlordanes and PCBs were collected from a depth of 5-6 feet. The metals and their maximum concentrations detected were iron (42,500 mg/kg), manganese (1,360 mg/kg), and mercury (1.9 mg/kg).

Based on the data, approximately 1,090 cy of sediments exceed the sediment criteria.

Osborne Creek

No constituents of potential concern were detected in sediments in Osborne Creek.

Table 4-1 summarizes sediment data for all areas. Figure 7-1 depicts the locations of the sediment sampling results that exceeded ARARs for all areas.

Groundwater

The affected groundwater at the Site is restricted to the Area South of I-88, within the shallow, unconsolidated water-bearing zone; the deep bedrock aquifer is not contaminated. Based upon the groundwater data, the groundwater plume at the Site appears to be limited to isolated zones of contamination within an approximate 240-foot wide by 500-foot long area. The constituents of concern in the groundwater are VOCs, SVOCs, PCBs, pesticides, and metals. The most prevalent VOCs and their corresponding maximum concentrations detected were toluene (7,500 micrograms per liter (µg/l)), xylenes (2,900 µg/l), 2-butanone (5,300 µg/l), 1,1-dichloroethane (4,700 µg/l), cis-1,2-dichloroethene (12,000 µg/l), 1,1,1-trichloroethane (310 µg/l), methylene chloride (1,600 µg/l), and vinyl chloride (21,000 µg/l). The most prevalent SVOCs and their corresponding maximum concentrations detected were phenol (6,900 µg/l), 2-methylphenol (1,100 µg/l), and 4-methylphenol (13,000 µg/l). PCBs and pesticides (alpha-chlordane, 4,4'-DDE, and heptachlor) were detected in monitoring wells outside of the VOC plume at relatively low levels of 1.6 µg/l, 0.11 µg/l, 0.031 µg/l, and 0.089 µg/l, respectively. The prevalent metals of concern and their maximum concentrations detected were arsenic (28 µg/l) and cadmium (6.2 µg/l). Other metals appear to be at background concentrations in the groundwater.

Table 5-1 summarizes groundwater quality data. See also, Figures 8-1 through 8-3.

Surface Water

One VOC, carbon disulfide, was detected at a maximum of 13 µg/l in two samples collected from Osborne Creek. However, a surface water quality standard has not been established for carbon disulfide and, most likely, this contaminant is not site-related, since no carbon disulfide was detected within the Site's soil, sediment, or groundwater. The pesticides alpha- and gamma-chlordane were detected in a sample collected from the western tributary near I-88 at 0.034 µg/l and 0.043 µg/l, respectively. No PCBs were detected in any of the surface water samples.

Based on the RI surface water sampling results, surface water in the eastern tributary and Osborne Creek has not been adversely affected by the former site operations, but the surface water in the western tributary may have been slightly impacted by constituents originating from the Site. However, these constituents are not detected in the surface water of the receiving stream (Osborne Creek), indicating that the concentrations are either diluted or not transported to the downstream sampling locations.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430 (a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using the remedy selection criteria which are described below. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

While widespread soil contamination is present throughout the South of I-88 area, three distinctive locations in this area contain "principal threat waste" since the COCs in these areas are highly mobile or toxic, and will be a continuing source of groundwater contamination because some of the contamination is located below the water table. The locations that contain principal threat waste are in the former incoming drum storage area, the former Lagoon 1 area, and within the former process building area. (See Figure 9-1.)

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The property is presently zoned residential/agricultural; the industrial use of the property was a nonconforming use (*i.e.*, the drum reclamation facility was permitted to continue operating after a zoning ordinance prohibiting such use had been established for this area)[3]. The current land use in the immediate vicinity of the Site is residential, agricultural, and recreational. Based on a number of factors, including EPA's observations as to land use in the area of the Site since at least 1989, the existing zoning for the Site property, an August 1999 resolution by the Town Board of the Town of Fenton affirming that zoning,[4] and subsequent communications between the Town Board, EPA, and the PRP Group, EPA determined that the reasonably-anticipated future use for the Site is residential/agricultural.

Currently, the on-site shallow, contaminated unconsolidated water bearing zone and the uncontaminated bedrock are not used for drinking water. Residents located in the vicinity of the Site use the deep bedrock as the sole source of potable water. Groundwater near the Site will continue to be used as a source of potable water under future-use scenarios. In addition, the potential future use of the unconsolidated water bearing zone on-site will be a drinking water source once cleanup levels have been achieved.

SUMMARY OF SITE RISKS

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future site conditions. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and anticipated future land uses.

The complete risk information for this Site is available in the following documents which were prepared by an EPA contractor and are located in the Administrative Record: A Baseline Risk Assessment - Human Health Evaluation (Final and Revised Addendum) and - Ecological Risk Assessment.

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[3] Letter from Donald F. Brown, Town Engineer, Town of Fenton, to Joel Singerman, Chief, Central New York Remediation Section, EPA, dated August 23, 1999. See Site Administrative Record.

[4] Resolution of August 23, 1999 by the Town of Fenton Town Board, and letter from Donald F. Brown, Town Engineer, Town of Fenton, to Jack Spicuzza, Ashland, Inc., dated November 2, 1999. See Site Administrative Record.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios:

Hazard Identification: In this step, the COCs at the Site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a "reasonable maximum exposure" (RME) scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response) are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health effects, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and noncancer health effects.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk). For noncancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for

a noncancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which noncancer health effects are not expected to occur.

The baseline risk assessment began with selecting COCs that would be representative of site risks. The evaluation identified 46 contaminants in the various media (sediment, surface and subsurface soil, and groundwater), including 10 metals, 11 VOCs, 12 SVOCs, PCBs, pesticides, and dioxin as COCs (see Table 6-1). Several of the contaminants, such as vinyl chloride and arsenic, are known to cause cancer in laboratory animals and are suspected to be human carcinogens.

The baseline risk assessment evaluated several potential children and adult exposure pathways (see Table 7-1), including a residential setting, site visitors, and on-site workers, that could result from current and future direct contact with: 1) contaminated soil (*e.g.*, children ingesting soil while playing in the area and gardeners having dermal contact with contaminated soil); 2) contaminated groundwater (*e.g.*, through ingestion of groundwater and inhalation of volatiles released into indoor air from groundwater while showering in an enclosed space); 3) contaminated surface water and sediment (*e.g.*, through ingestion and dermal exposure to contaminated surface water and sediment) ; 4) inhalation of airborne particles; and 5) ingestion of vegetables grown in contaminated soil.

At the Site, total estimated excess cancer risks (see Table 8-1 and 8-2) for individuals exposed to site media range from 5×10^{-7} to 6×10^{-1}. In the Area South of I-88, the following exposure media, routes, and corresponding cancer risk exceed the upper bound limit (1×10^{-4}) of risk for future residents and present a principal threat: ingestion of overburden groundwater in the unconsolidated till material (4×10^{-1}) and vegetables grown in contaminated soil (1×10^{-2}) and dermal exposure to groundwater (8×10^{-3}) and inhalation of volatiles released into indoor air from groundwater (2×10^{-1}). Also, in this area, ingestion of overburden groundwater for a current/future worker scenario represents a cancer risk of 1×10^{-1}.

In the Area North of I-88, the same risks are presented to the future residents and workers as found in the Area South of I-88 with varying degree. They are as follows: ingestion of overburden groundwater (2×10^{-1}) and vegetables grown in contaminated soil (2×10^{-2}), as well as dermal exposure to groundwater (4×10^{-3}) and inhalation of volatile released into indoor air from groundwater (1×10^{-1}). The ingestion of overburden groundwater for future workers represents a cancer risk of 7×10^{-2}.

In the Area South of Osborne Hollow Road, ingestion of vegetables grown in contaminated soil by future residents represents a cancer risk of 1×10^{-4}, which is the upper bound limit of risk.

Total estimated HI values for the future exposure scenarios at the Site range from 0.007 to 800 (see Tables 9-1 and 9-2). The HI exceeds 1 for the future resident adult for the following pathways in both the South of I-88 and North of I-88 areas: ingestion of soil (HI of 3 and 6, respectively), overburden groundwater (100 and 70), and vegetables grown in contaminated soil (100 and 200); dermal exposure to surface soil (2 and 7) and to groundwater (6 and 2); and inhalation of volatiles released into indoor air from groundwater (10 and 3). The future child resident scenarios also exceed an HI of 1 for all of the pathways listed previously except dermal contact with soil in the Area South of I-88 and range from 1 to 500. The current/future worker scenario that results in an HI above 1 is ingestion of groundwater (40) in the South of I-88 area. In the Area North of I-88, ingestion of groundwater resulted in an HI of 30. In the South of Osborne Hollow Road area, ingestion of soil (2) and vegetables grown in contaminated soil (1) under the future child resident scenario results in a noncancer hazard greater than or equal to 1.

These risks and hazard levels indicate that there would be significant potential risk to future residents from direct exposure to contaminated soil and groundwater, and from vegetables grown in contaminated soil. These risk estimates are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative assumptions about the frequency and duration of an individual's exposure to the soil and groundwater, as well as the toxicity of chemicals of concern, such as arsenic, vinyl chloride, PAHs, alpha-chlordane, gamma-chlordane, and PCBs.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry analysis uncertainty can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual will actually come in contact with the chemicals of

concern, the period of time over which such exposure will occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides upper bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

Ecological Risk Assessment

A four-step process is utilized for assessing site-related ecological risks for a reasonable maximum exposure scenario: *Problem Formulation*—a qualitative evaluation of contaminant release, migration, and fate; identification of COCs, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study. *Exposure Assessment*—a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations. *Ecological Effects Assessment*—literature reviews, field studies, and toxicity tests, linking contaminant concentrations to effects on ecological receptors. *Risk Characterization*—measurement or estimation of both current and future adverse effects.

A vegetation and wildlife survey identified five plant communities that exist at the Site that includes deciduous forest, conifer plantation, shrub upland/old field, stream and flood plain, and wetlands. The Area North of I-88 is heavily vegetated with trees and shrubs, and grasses and weed species are present in the area of the seasonal man-made pond (a former lagoon). The Area South of Osborne Hollow Road is also vegetated with stands of weed species and woody shrubs. In contrast, the Area South of I-88 is physically disturbed by historical industrial activities and site cleanup, and contains several unvegetated areas covered with gravel, coarse dirt, and foundations of former structures. The eastern and western borders of the South of I-88 area are dominated by large weed growth and stands of secondary growth trees near the seasonal tributaries. Seasonal tributaries are present along the eastern and western borders of the Site. Wetland vegetation is associated with both tributaries and the man-made pond. Osborne Creek is the only major water feature near the Site, and flows in a westerly direction along the northern border of the Site. The creek flows into the Chenango River approximately one mile downstream.

The baseline risk assessment began with selecting COCs that could pose a risk of adverse effects to exposed ecological resources. The COCs selected for quantitative evaluation include 17 inorganics, 3 VOCs, 19 SVOCs, 13 pesticides, PCBs, and dioxin. Potential risk to several indicator species through exposure to the COCs in soil, surface water, and sediment was evaluated. For assessment of direct exposure to surface water and sediment, concentrations of COCs in these media were compared to benchmark values expected to result in adverse biological effects. For assessment of direct exposure to surface soils, plants, soil invertebrates, the eastern cottontail rabbit, and the American robin were selected as indicator species.

In order to evaluate potential transfer of soil contaminants through the terrestrial food chain, exposure to site media through both a herbivore and omnivore food chain was calculated. The herbivore food chain was evaluated using an eastern cottontail rabbit as the receptor of concern ingesting plant material and surface soils at the Site. The results indicated that several metals, pesticides, and PCBs pose a potential risk to herbivorous mammals. Of the metals, lead poses the greatest risk especially within the Area South of I-88.

During Phase II of the RI, earthworms were collected from several on-site and background locations. At the on-site locations, earthworms were purposely collected in areas of high chemical concentration. PCBs were detected in all tissue samples (including background), and several pesticides (chlordanes, dieldrin, gamma-BHC, endosulfan) and phthalates were detected in earthworm tissue samples collected from the on-site samples. The presence of these chemicals of concern indicates that bioaccumulation is occurring in earthworms.

The omnivore food chain was evaluated using the American robin as the receptor of concern consuming both fruits and invertebrates from the Site. The results of the calculations show that pesticides (dieldrin and chlordanes) and PCBs pose potential risks to omnivorous bird species.

No information has been collected regarding the benthic communities in the tributaries or in the Osborne Creek. Therefore, the extent of uptake of contaminants in the aquatic food chain and the potential for adverse impacts could not be analyzed. However, based on the chemicals detected in site surface waters, chlordane would be the most likely to accumulate in the tissues of aquatic organisms. The pesticides and PCBs found in the sediment samples can bioaccumulate in aquatic species.

On a chemical and site area basis, the major concerns for ecological receptors include: (1) lead, pesticides (primarily chlordane) and PCBs in

the Area South of I-88 soils; (2) PCBs in the Area North of I-88 soils; (3) PCBs and chlordane, in the Area North of I-88 sediments; (4) PCBs and chlordane, in the East Tributary sediments; and (5) chlordane in the West Tributary sediments.

Basis for Action

Based upon the human health and ecological risk assessments, EPA has determined that the response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances from the Site into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information (e.g., current and reasonably-anticipated future land use) and standards such as ARARs and risk-based levels established in the risk assessment.

The following remedial action objectives have been established for the Site:

- minimize or eliminate contaminant migration to the groundwater and surface waters to levels that ensure the beneficial reuse of these resources;
- restore groundwater quality to levels which meet state and federal drinking-water standards within a reasonable time frame;
- reduce or eliminate the direct contact threat associated with contaminated soil, sediment, and groundwater; and
- minimize exposure of fish and wildlife to contaminants in surface water, sediments, and soils.

DESCRIPTION OF ALTERNATIVES

CERCLA Section 121(b)(1), 42 U.S.C. §9621(b)(1), mandates that a remedial action must be protective of human health and the environment, be cost-effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a

principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA Section 121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. §9621(d)(4).

As was noted previously, principal threat wastes are those source materials considered to be highly toxic or highly mobile that, generally, cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. They include highly mobile toxic materials or materials having high concentrations of toxic compounds. Although no "threshold level" of toxicity or risk has been established to equate to a principal threat, where toxicity and mobility of source material combine to pose a potential risk of 10^{-3} or greater (as is the case with this site), generally, treatment alternatives should be evaluated[5].

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report. The FS report presents a total of nine remedial alternatives categorized by the media (soil/sediment and groundwater) they address. This ROD evaluated, in detail, seven remedial alternatives for addressing the contamination associated with the Site.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with the responsible parties, or procure contracts for design and construction. The present-worth costs for the alternatives discussed below are calculated using a discount rate of seven percent and a 30-year time interval.

The remedial alternatives are:

Soil/Sediment Alternatives

Alternative SS-1: No Action

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[5] *A Guide to Principal Threat and Low Level Threat Wastes*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, 9380.3-06FS, November 1991.

Capital Cost:	$0
Annual Operation and Maintenance (O&M) and Monitoring Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the contaminated soils/sediments. This alternative assumes no additional activity takes place beyond the previously-implemented activities.

Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by this assessment, remedial actions may be implemented in the future to remove or treat the waste.

Alternative SS-2: Excavation and On-Site Disposal of Contaminated Soils/Sediments, Excavation and Off-Site Treatment/Disposal of Principal Threat Waste Areas, and Installation of Multilayer Cap

Capital Cost:	$6,719,000
Annual O&M and Monitoring Cost:	$7,000
Present-Worth Cost:	$6,806,000
Construction Time:	8 months

This alternative includes excavating heavily-contaminated soils located in the three areas of principal threat within the Area South of I-88. The areas that contain principal threat waste are located in the former incoming drum storage area (1,100 cy), the former Lagoon 1 area (3,300 cy), and within the former process building area (3,350 cy). These areas are characterized by relatively high levels of contamination that extend into the water table. In these areas, soils with PCB concentrations which equal or exceed 50 mg/kg would be excavated. Also, soils within five feet of the water table that exceed VOC TAGM objectives would be excavated to the water table. The excavated soils from these areas would be characterized and transported for treatment/disposal at an off-site

Resource Conservation and Recovery Act (RCRA)- and/or Toxic Substances Control Act (TSCA)-approved facility, as appropriate.

In the North of I-88 and South of Osborne Hollow Road areas, soils contaminated with SVOCs, pesticides, and/or metals exceeding the PRGs would be excavated; for those soils with PCBs and/or VOCs exceeding TAGM objectives, the respective TAGM objectives would be used to define the limits of the excavation.

Sediments in the tributaries which exceed NYSDEC's sediment criteria would be excavated/dredged. The estimated volume of contaminated sediment is 1,870 cy. All excavated/dredged sediments would be dewatered, as necessary.

Those excavated/dredged waste materials, soils, and sediments (from the North of I-88 and South of Osborne Hollow Road areas and the tributaries) that have PCB concentrations less than 50 mg/kg would be consolidated under a multilayer cap with the pre-existing soils in the Area South of I-88 that exceed the PRGs. The cap, which would be in compliance with New York State 6 NYCRR Part 360 requirements, would cover approximately 3.9 acres.

Those excavated/dredged waste materials, soils, and sediments with PCB concentrations which equal or exceed 50 mg/kg would be sent off-site for disposal at a RCRA- and/or TSCA-compliant facility, as appropriate.

In all of the excavated areas, except the area to be capped, clean material would be used as backfill. The excavated areas located within the area to be capped (and greater than five feet above the water table) would be backfilled with excavated material from Area North of I-88 and Area South of Osborne Hollow Road; those excavated areas located within five feet of the water table would be backfilled with clean fill.

Any wetlands impacted by remedial activities would be fully restored. The restored wetlands would require routine inspection for several years to ensure adequate survival of the planted vegetation.

This alternative would also include implementation of institutional controls (the placement of restrictions on the future use of the Site in order to protect the integrity of the cap) and would implement a public awareness program to ensure that the nearby residents are familiar with all aspects of this response action.

Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the Site be reviewed

every five years. If justified by this assessment, remedial actions may be implemented to remove or treat the waste.

Alternative SS-3: Excavation of Contaminated Soils/Sediments and Off-Site Treatment/Disposal

Capital Cost:	$17,430,000
Annual O&M and Monitoring Cost:	$0
Present-Worth Cost:	$17,430,000
Construction Time:	6 months

This alternative includes excavating and/or dredging approximately 50,000 cubic yards of unsaturated soil and sediment exceeding soil/sediment cleanup objectives.

For those soils contaminated with SVOCs, pesticides, and metals, the PRGs would be used to define the limits of the excavation. For those soils with PCBs and/or VOCs exceeding TAGM objectives, the respective TAGM objectives would be used to define the limits of the excavation. Also, soils within five feet of the water table that exceed VOC TAGM objectives would be excavated to the water table. Under this alternative, those sediments exceeding NYSDEC's sediment criteria would also be excavated/dredged.

Each excavated area would be backfilled with clean fill and revegetated, as appropriate. All excavated/dredged material would be characterized and transported for treatment/disposal at an off-site RCRA- and/or TSCA-compliant facility, as appropriate.

Any wetlands impacted by remedial activities would be fully restored. The restored wetlands would require routine inspection for several years to ensure adequate survival of the planted vegetation.

A cost estimate is available in the Table 10-1.

Alternative SS-4: Excavation of Contaminated Soils/Sediments and On-Site Incineration and Disposal

Capital Cost:	$32,039,000

Annual O&M and Monitoring Cost:	$0
Present-Worth Cost:	$32,039,000
Construction Time:	24 months

This alternative is identical to Alternative SS-3, except that instead of transporting the excavated/dredged material for off-site treatment/disposal, it would be incinerated on-site to destroy the organic contaminants and solidified/stabilized to immobilize the inorganic constituents. The off-gases from the incineration unit would be collected and treated. Once the treated material achieved soil TAGM objectives, it would be tested in accordance with the Toxicity Characteristic Leaching Procedure (TCLP) to determine whether it constitutes a RCRA hazardous waste and, provided that it passes the test, it would be used as backfill material for the excavated areas. Treated material above TCLP levels would either undergo additional treatment or be disposed of at an approved off-site facility, as appropriate.

Groundwater Remedial Alternatives

Alternative GW-1: No Action and Long-Term Monitoring

Capital Cost:	$0
Annual Monitoring Cost:	$40,000
Present-Worth Cost:	$500,000
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the problem of groundwater contamination at the Site. This alternative would, however, include a long-term groundwater monitoring program. Under this monitoring program, groundwater samples would be collected and analyzed annually.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented in the future to remove or treat the wastes.

Alternative GW-2: Monitored Natural Attenuation

Capital Cost:	$137,000
Annual Monitoring Cost:	$60,000
Present-Worth Cost:	$887,000
Construction Time:	0 months

Under this alternative, the groundwater contamination would be addressed through natural attenuation processes (*i.e.*, biodegradation, dispersion, sorption, volatilization, oxidation-reduction reactions). As part of a long-term groundwater monitoring program, groundwater samples would be collected and analyzed quarterly in order to verify that the level and extent of groundwater contaminants (e.g., VOCs) are declining and that conditions are protective of human health and the environment. In addition, biodegradation parameters (e.g., oxygen, nitrate, sulfate, methane, ethane, ethene, alkalinity, redox potential, pH, temperature, conductivity, chloride, and total organic carbon) would be used to assess the progress of the degradation process.

Under this alternative, the installation and use of groundwater wells at the Site for drinking water purposes would be prohibited by institutional controls. Such prohibition could be removed after cleanup standards were met in the groundwater.

Because this alternative would result in contaminants remaining on-site, CERCLA requires that the Site be reviewed every five years. If this review indicates that monitored natural attenuation was not effective, more aggressive remedies, such as groundwater extraction and treatment, may be implemented.

Alternative GW-3: Groundwater Extraction and Treatment

Capital Cost:	$1,247,000
Annual O&M and Monitoring Cost:	$137,000
Present-Worth Cost:	$2,947,000
Construction Time:	12 months

Under this alternative, a network of recovery wells would be used to extract contaminated groundwater which would be treated by air stripping,

liquid phase carbon adsorption and/or chemical precipitation technologies (or other appropriate treatment technology) and the effluent would be discharged to surface water. The effluent limits would be protective of the aquatic organisms and would meet the surface water quality criteria.

As part of a long-term groundwater monitoring program to evaluate the effectiveness of the groundwater extraction and treatment remedy, groundwater samples would be collected and analyzed semiannually.

Under this alternative, the installation and use of groundwater wells at the Site for drinking water purposes would be prohibited by institutional controls. Such prohibition could be removed after cleanup standards were met in the groundwater.

For cost estimating purposes, a 30-year operation time was used. A more detailed cost estimate is available in the Table 10-2.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA Section 121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 CFR §300.430(e)(9) and OSWER Directive 9355.3-01 (*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA: Interim Final*, October 1988). The detailed analysis consisted of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following "threshold" criteria are the most important and must be satisfied by any alternative in order to be eligible for selection:

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

The following "primary balancing" criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. *Long-term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume through treatment* is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. *Cost* includes estimated capital and O&M costs, and net present-worth costs.

The following "modifying" criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was discussed in the Proposed Plan:

8. *State acceptance* indicates whether, based on its review of the RI/FS reports and Proposed Plan, the State concurs with, opposes, or has no comments on the selected remedy.

9. *Community acceptance* refers to the public's general response to the alternatives described in the RI/FS reports and Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria noted above, follows.

Overall Protection of Human Health and the Environment

Alternative SS-1 (no action) would not be protective of human health and the environment, since it would not actively address the potential human health and ecological risks posed by the contaminated soils and sediments. The existing deed restrictions on the Site property could, however, limit the intrusiveness of future activity that could occur on the Site.

Alternative SS-2 (excavation and on-site disposal of contaminated soils/sediments, excavation and off-site treatment/disposal of principal threat waste areas, and installation of a multilayer cap) would, by contrast, be significantly more protective than Alternative SS-1, in that the risk of incidental contact with waste by humans and ecological receptors would be significantly reduced by excavating, consolidating, and containing the contaminated soil and by removing off-site the most highly contaminated soil. Capping would prevent surface contaminant migration from the Site and would reduce infiltration, thereby significantly reducing the migration of contaminants to the groundwater. Although institutional controls might prevent the utilization of the Site in a manner that would expose human receptors to Site-related contamination, Alternative SS-2 would not be protective of human health if the property were to be used in the future in accordance with the reasonably-anticipated future residential/agricultural land use.

Alternative SS-3 (excavation of contaminated soils/sediments and off-site treatment/disposal) and Alternative SS-4 (excavation of contaminated soils/sediments and on-site treatment) would be the most protective alternatives, since the long-term risk of incidental contact with waste by humans and ecological receptors would be completely eliminated. Under these alternatives, the contaminants would either be completely removed from the Site or treated on-site. In addition, by removing the contaminated soils, these alternatives would permanently eliminate the source of the groundwater contamination.

Alternative GW-1 (no action) and Alternative GW-2 (monitored natural attenuation) would rely upon natural attenuation to restore groundwater quality to drinking water standards. Alternative GW-3, which would include extraction and treatment of contaminated groundwater, would result in the restoration of water quality in the aquifer more quickly than monitored natural attenuation alone. The results of natural attenuation screening showed limited evidence of natural attenuation. Since the characterization data necessary to quantify the rates of biological degradation processes was not collected, it is not possible to develop time frames for the natural attenuation of contaminants in the groundwater, precluding a determination of remediation time frames for Alternatives GW-1 and GW-2. Based upon preliminary modeling results, it has been estimated that it will take several decades to achieve groundwater standards under Alternative GW-3.

Compliance with ARARs

There are currently no promulgated standards for contaminant levels in soils and sediments, only "To-Be-Considered" cleanup objectives. EPA is using PRGs and NYSDEC's TAGM limits for soils and NYSDEC's

sediment criteria *(Technical Guidance for Screening Contaminated Sediments*, January 1999).

Since the contaminated soils and sediments would not be addressed under Alternative SS-1 (no action), this alternative would not comply with chemical-specific ARARs. Since containment of the contamination would be inconsistent with the reasonably-anticipated residential/agricultural future use of the property, Alternative SS-2 (excavation and on-site disposal of contaminated soils/sediments, excavation and off-site treatment/disposal of principal threat waste areas, and installation of a multilayer cap) would not be consistent with local zoning requirements.

A New York State 6 NYCRR Part 360 cap is an action-specific ARAR for closure. Therefore, Alternative SS-2 would satisfy this action-specific ARAR.

Alternative SS-3 (excavation of contaminated soils/sediments and off-site treatment/disposal) and Alternative SS-4 (excavation of contaminated soils/sediments and on-site treatment) would involve action-specific ARARs. Alternative SS-3 would be subject to state and federal regulations regarding transportation and off-site treatment/disposal of wastes. Both alternatives would involve the excavation of contaminated soils, and would require compliance with fugitive dust and VOC emission regulations. In the case of Alternative SS-4, compliance with air emission standards would be required at the on-site treatment facility. Treatment of off-gases must comply with New York State Air Guide—1 for the Control of Toxic Ambient Air Emissions and may be required to meet the requirements of New York State Regulations for Prevention and Control of Air Contamination and Air Pollution.

EPA and NYSDEC have promulgated health-protective Maximum Contaminant Levels (MCLs), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). While contamination has not been found in any existing private wells in the vicinity of the Site, groundwater contamination at the Site itself presents very high human health cancer risks for future on-site residents and visitors if not treated. In the northern part of the South of I-88 area, the ingestion of on-site overburden groundwater would pose a 4×10^{-1} risk (for every 10 people that could be exposed, four extra cancers *may* occur as a result of exposure) and the inhalation of volatiles released into indoor air from the on-site groundwater would pose a 2×10^{-1} risk (for every 10 people that could be exposed, two extra cancers *may* occur as a result of exposure). Alternatives GW-1 (no action) and GW-2 (monitored natural attenuation) do not provide for any direct remediation of groundwater and would, therefore, rely upon natural attenuation to achieve chemical-specific ARARs. Alternative GW-3 (groundwater

extraction and treatment) would be the most effective in reducing groundwater contaminant concentrations below MCLs, since it would include the collection and treatment of contaminated groundwater.

Long-Term Effectiveness and Permanence

Alternative SS-1 (no action) would involve no controls other than the current deed restrictions and, therefore, would not be effective in permanently preventing exposure to contaminants on-site or eliminating the potential for contaminants migrating off-site. Alternative SS-2 (excavation and on-site disposal of contaminated soils/sediments, excavation and off-site treatment/disposal of principal threat waste areas, and installation of a multilayer cap) would reduce the residual risk of untreated waste on the Site by taking the highly contaminated soil off-site for disposal/treatment and isolating the remaining contaminants from contact with human and environmental receptors and the mobility caused by infiltrating rainwater. The 6 NYCRR Part 360 cap or equivalent multilayer cap would require routine inspection and maintenance to insure long-term effectiveness and permanence. Routine maintenance of the cap, as a reliable management control, would include mowing, fertilizing, reseeding and repairing any potential erosion or burrowing rodent damage.

Alternative SS-3 (excavation of contaminated soils/sediments and off-site treatment/disposal) and Alternative SS-4 (excavation of contaminated soils/sediments and on-site treatment) would be most effective in the long term and would provide permanent remediation by either removing the wastes from the Site or treating them on-site.

Alternative GW-1 (no action) and Alternative GW-2 (monitored natural attenuation) would be expected to have minimal long-term effectiveness, since they both would rely upon natural attenuation to restore groundwater quality, which has not been proven to be occurring at this site. Alternative GW-3 (groundwater extraction and treatment), by actively pumping and treating the contaminated groundwater, would have long-term effectiveness and permanence and achieve groundwater standards at a faster rate than Alternatives GW-1 and GW-2.

Alternative GW-3 would generate treatment residues which would have to be appropriately handled; Alternatives GW-1 and GW-2 would not generate such residues.

Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative SS-1 (no action) would provide no reduction in toxicity, mobility or volume.

While excavating contaminated soils and sediments, consolidation, and installation of a landfill cap under Alternative SS-2 would prevent further migration of and potential exposure to these materials, and would nearly eliminate the infiltration of rainwater into the waste disposal areas and the associated leaching of contaminants from these areas, only a small degree of the reduction in mobility would be accomplished through treatment. This alternative would only slightly meet CERCLA's preference for treatment in that only approximately 16 percent of the total quantity of the waste material to be excavated would be sent off-site for treatment/disposal. Similarly, this alternative would only slightly satisfy the statutory preference of CERCLA to use a permanent solution and alternative treatment technology to the maximum extent practicable. Under this alternative, the materials which would be sent off-site would include the soils and sediments exceeding 50 mg/kg PCBs and other principal threat waste soils.

Under Alternative SS-3 (excavation of contaminated soils/sediments and off-site treatment/disposal), contaminants would be removed from the Site for treatment/disposal, thereby reducing their toxicity, mobility, and volume. While it is anticipated that some treatment of the excavated soils and sediments will be necessary prior to their disposal, the quantity is not known.

Under Alternative SS-4 (excavation of contaminated soils/sediments and on-site treatment), an overall reduction in volume and toxicity would be achieved, as well as elimination of waste mobility using incineration.

Alternatives GW-1 (no action) and GW-2 (monitored natural attenuation) would not actively reduce the toxicity, mobility, or volume of contaminants through treatment. These alternatives would rely on natural attenuation to reduce the levels of contaminants. Collecting and treating contaminated groundwater under Alternative GW-3, on the other hand, would reduce the toxicity, mobility, and volume of contaminants, thereby satisfying CERCLA's preference for treatment.

Short-Term Effectiveness

Alternative SS-1 (no action) does not include any physical construction measures in any areas of contamination and, therefore, would not present a risk to the community as a result of its implementation.

Alternative SS-2 (excavation and on-site disposal of contaminated soils/sediments, excavation and off-site treatment/disposal of principal threat waste areas, and installation of a multilayer cap) would require the delivery of cap construction materials and off-site transport of contaminated waste materials, Alternative SS-3 (excavation of

contaminated soils/sediments and off-site treatment) would require the off-site transport of a greater amount of contaminated waste material, and Alternative SS-4 (excavation of contaminated soils/sediments and on-site treatment) would require the delivery of treatment system components. All three alternatives would increase vehicle traffic and impact the local roadway system and could subject nearby residents to increased noise levels. Alternatives SS-2 and SS-3 may pose the potential for traffic accidents which could result in releases of hazardous substances. Alternative SS-4 could subject the residents to increased noise levels during the estimated two-year operation of on-site thermal treatment system.

Also, under all three action alternatives, disturbance of the land during excavation and/or construction activities could affect the surface water hydrology of the Site. There is a potential for increased stormwater runoff and erosion during excavation and construction activities that would have to be properly managed to prevent excessive water and sediment loading. For these alternatives, appropriate measures would have to be taken during excavation activities to prevent transport of fugitive dust and exposure of workers and downgradient receptors to volatile organic compounds.

All of the groundwater alternatives might present some limited risk to on-site workers through dermal contact and inhalation related to groundwater sampling activities. Alternative GW-3 (groundwater extraction and treatment) would pose an additional risk to on-site workers since it would involve the installation of extraction wells through potentially contaminated soils and groundwater. The risks to on-site workers could, however, be minimized by utilizing proper protective equipment.

Since no actions would be performed under Alternative S-1, there would be no implementation time. It is estimated that Alternative SS-2 would require eight months to implement, Alternative SS-3 would require six months to implement, and Alternative SS-4 would require two years to implement.

It is estimated that Alternatives GW-1 (no action) and GW-2 (monitored natural attenuation) would require one month to implement, since developing a long-term groundwater monitoring program would be the only activity that is required. It is estimated that the groundwater extraction and treatment systems under Alternative GW-3 would be constructed in about one year.

Because the results of natural attenuation screening were inconclusive, and because of the lack of important site-specific information or

"evidence" of natural attenuation, including characterization data necessary to quantify the rates of biological degradation processes, it is not possible to develop time frames for the natural attenuation of contaminants in the groundwater, precluding a determination of remediation time frames for Alternatives GW-1 and GW-2. Based upon preliminary modeling results, it has been estimated that it will take several decades to achieve groundwater standards under Alternative GW-3.

Implementability

Alternative SS-1 (no action) would be easily implementable, as the only activity is establishing a public awareness program. Alternative SS-3 (excavation of contaminated soils/sediments and off-site treatment) would use reliable earthmoving equipment and proven techniques, and established administrative procedures, and sufficient facilities are available for treatment and disposal of the excavated soils. Therefore, this alternative can be readily implemented. Alternative SS-2 (excavation and on-site disposal of contaminated soils/sediments, excavation and off-site treatment/disposal of principal threat waste areas, and installation of a multilayer cap), although more difficult to implement than the no-action alternative and the off-site treatment/disposal alternative, can be accomplished using technologies known to be reliable and can be readily implemented. Equipment, services and materials for this work are readily available. The actions under this alternative would also be administratively feasible.

Although Alternative SS-4 (excavation of contaminated soils/sediments and on-site treatment) would use proven earthmoving equipment and techniques and established administrative procedures, it would be more difficult to implement than the other alternatives, given the complex nature of operating an on-site incineration process. Special concerns that would need to be addressed involve the capturing and treatment of residuals (volatilized contaminants, dust, and other condensates) due to the fine-grained soils at the Site. Under Alternative SS-4, heavy metals such as lead and mercury would necessitate the installation of an off-gas cleaning system. In addition, some delay may be experienced if an incinerator is not readily available.

Alternative GW-1 (no action) would be easily implementable, as the only activity is establishing a public awareness program. Alternative GW-2 (monitored natural attenuation) would also be easily implementable, however, it would involve monitoring of natural attenuation parameters to demonstrate that it is reliable in achieving the specified performance goals.

The air stripping, liquid phase carbon adsorption, and chemical precipitation technologies that may be used for Alternative GW-3 (groundwater extraction and treatment) are proven and reliable in achieving the specified performance goals and are readily available. All equipment is readily available and easily installed.

Cost

The present-worth costs are calculated using a discount rate of seven percent and a 30-year time interval. The estimated capital, O&M and monitoring (OM&M), and present-worth costs for each of the alternatives are presented below.

Soil/Sediment Alternatives	Capital Cost	Annual OM&M Cost	Present-Worth Cost
SS-1	$0	$0	$0
SS-2	$6,719,000	$7,000	$6,806,000
SS-3	$17,430,000	$0	$17,430,000
SS-4	$32,039,000	$0	$32,039,000

Groundwater Alternatives	Capital Cost	Annual OM&M Cost	Present-Worth Cost
GW-1	$0	$40,000	$500,000
GW-2	$137,000	$60,000	$887,000
GW-3	$1,247,000	$137,000	$2,947,000

As can be seen by the cost estimates, there are no costs associated with the no action alternative for soil, Alternative SS-1. Alternative SS-4 (excavation of contaminated soils/sediments and on-site treatment) is the most costly soil alternative at $32,039,100. The least costly groundwater remedy is no action at $500,000. Alternative GW-2 (monitored natural attenuation) is significantly more expensive than Alternative GW-1 (no action) because of the need to install additional monitoring wells and to analyze for natural attenuation parameters. Alternative GW-3 (groundwater extraction and treatment) is the most costly groundwater alternative at $2,947,000. Cost estimates for the selected soil and groundwater remedy can be found in Table 10-1 and 10-2, respectively.

State Acceptance

NYSDEC concurs with the selected remedy, a letter of concurrence is attached (see Appendix IV).

Community Acceptance

Comments received during the public comment period indicate that the public generally supports the selected remedy. While the PRP Group supports the groundwater component of the selected remedy, it expressed a preference for a variation of the capping alternative, Alternative SS-2 (rather than the off-site treatment/disposal of only the soils and sediments excavated/dredged from the principal threat waste areas called for by Alternative SS-2, the PRP Group called for the off-site treatment/disposal of all of the excavated soils/sediments). This alternative in either form, however, is not consistent with the reasonably-anticipated future land use, as discussed above.

The PRP Group submitted a letter of March 8, 2000 raising issues about EPA submitting its proposed remedy and the PRP Group's preferred remedy for the Site for review by the National Remedy Review Board (NRRB). EPA responded via a March 23, 2000 letter that indicated that the PRP Group's preferred remedy fails to pass the threshold NCP criterion of being protective of human health and the environment for the reasonably-anticipated future land use. Thus, it is not a viable alternative for consideration by the NRRB.

Comments received during the public comment period are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA and NYSDEC have determined that Alternative SS-3, excavation of contaminated soils/sediments and off-site treatment/disposal, and Alternative GW-3, extraction and treatment of groundwater contamination are the appropriate remedy, best satisfy the requirements of CERCLA Section 121, 42 U.S.C. §9621 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR §300.430(e)(9).

Alternative SS-1 (no action) would not be protective of human health and the environment, since it would not actively address the potential human health and ecological risks posed by the contaminated soils and sediments.

Although institutional controls might prevent the utilization of the Site in a manner that would expose human receptors to Site-related

contamination, Alternative SS-2 (excavation and on-site disposal of contaminated soils/sediments, excavation and off-site treatment/disposal of principal threat waste areas, and installation of a multilayer cap) would not be protective of human health if the property were to be used in the future in accordance with the reasonably-anticipated future land use (residential/agricultural). In addition, Alternative SS-2 would only slightly meet CERCLA's preferences for treatment, and would be a permanent remedial solution for only a small fraction of the contaminated soils/sediments.

Alternative SS-3 (excavation of contaminated soils/sediments and off-site treatment/disposal) and Alternative SS-4 (excavation of contaminated soils/sediments and on-site treatment) would be the most protective alternatives, since the risk of incidental contact with waste by humans and ecological receptors would be completely eliminated. Under these alternatives, the contaminants would either be completely removed from the Site for treatment/disposal or treated on-site. In addition, by removing the contaminated soils, both of these alternatives would permanently eliminate the source of the groundwater contamination. Of the two alternatives, Alternative SS-3 is believed to be able to achieve ARARs more quickly and at substantially less cost than Alternative SS-4.

Alternative GW-3 includes active treatment of the contaminated groundwater and would restore the aquifer to drinking water quality in a substantially shorter time frame than the Alternatives GW-1 (no action) and GW-2 (monitored natural attenuation).

Description of the Selected Remedy

The selected remedy involves:

- Excavation and/or dredging of approximately 50,000 cubic yards of unsaturated soil and sediments exceeding soil/sediment cleanup objectives. For those soils contaminated with SVOCs, pesticides, and metals, the PRGs will be used to define the limits of the excavation. For those soils with PCBs and/or VOCs exceeding TAGM objectives, the respective TAGM objectives will be used to define the limits of the excavation.

- Sediments exceeding NYSDEC's sediment criteria (*Technical Guidance for Screening Contaminated Sediments*, January 1999) will also be excavated/dredged;

- Each excavated area will be backfilled with clean fill and revegetated, as appropriate. All excavated/dredged material will be characterized and transported for treatment/disposal at an off-site RCRA- and/or TSCA-compliant facility, as appropriate;

- Restoration of any wetlands impacted by remedial activities. The restored wetlands will require routine inspection for several years to ensure adequate survival of the planted vegetation;

- Extraction of contaminated groundwater utilizing a network of recovery wells, and treatment of the extracted groundwater (by air stripping, liquid phase carbon adsorption, and chemical precipitation technologies, or other appropriate treatment), followed by discharge to surface water;

- Implementation of institutional controls (the placement of deed restrictions prohibiting the installation and use of groundwater wells at the Site until groundwater cleanup standards are achieved);

- Long-term monitoring of groundwater, surface water, and nearby residential private wells to ensure the effectiveness of the selected remedy.

As part of a long-term groundwater monitoring program, groundwater samples will be collected and analyzed in order to verify that the level and extent of contaminants are declining from baseline conditions and that conditions are protective of human health and the environment.

During the design phase, a study will be performed to better characterize the extent of sediments that will require remediation in the two tributaries and the flood plain at the mouth of the western tributary and to evaluate the potential ecological impacts, such as loss of a habitat, associated with removing the contaminated sediments.

A wetlands assessment and restoration plan will be needed for any wetlands impacted or disturbed by remedial activities

The selected remedy is believed to be able to achieve the ARARs more quickly, or as quickly than the other alternatives. Therefore, the selected remedy will provide the best balance of tradeoffs among alternatives with respect to the evaluating criteria. EPA and the NYSDEC believe that the selected remedy will be protective of human health and the environment, be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The selected remedy will meet the statutory preference for the use of treatment as a principal element.

Summary of the Estimated Remedy Costs

Since there are no O&M and monitoring costs associated with the selected soil remedy, the estimated capital and present-worth costs for the selected soil remedy are $17,430,000; the estimated capital, annual

O&M and monitoring, and present-worth costs for the selected groundwater remedy are $1,247,000, $137,000, and $2,947,000, respectively. Tables 10-1 and 10-2 provide the basis for these cost estimates.

It should be noted that these cost estimates are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual project cost. These cost estimates are based on the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedy.

Expected Outcomes of the Selected Remedy

The risk assessment indicates that there would be significant potential risk to future residents from direct exposure to contaminated soil and groundwater and from vegetables grown in contaminated soil in the absence of any actions to control or mitigate the contamination. The ecological risk assessment identified contaminant-related concerns for ecological receptors. Specifically, several metals, pesticides, and PCBs pose a potential risk to herbivorous mammals, PCBs, pesticides, and phthalates are bioaccumulating in earthworms, pesticides and PCBs pose potential risks to omnivorous bird species, chlordane is likely to accumulate in the tissues of aquatic organisms, and pesticides and PCBs found in the sediment samples can bioaccumulate in aquatic species.

Under the selected remedy, the risk to human health and the environment would be eliminated in that the contaminated soils that pose an exposure risk would be excavated. In addition, removal of the contaminated soils, which would eliminate the source of the groundwater contamination, in combination with extracting and treating the contaminated groundwater, would eventually restore the groundwater to drinking water standards. These actions would restore the Site such that it could be utilized in the future in accordance with the reasonably-anticipated future land use.

Under the selected remedy, it is anticipated that it will take 6 months to remediate the contaminated soils and sediments and several decades to achieve groundwater standards.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment

technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site.

For the reasons discussed below, EPA has determined that the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will protect human health through the excavation of contaminated soil and sediments, thereby eliminating the threat of exposure via direct contact with or ingestion of these contaminated media. The selected remedy will also be protective of the environment in that the excavation of contaminated soil and sediments will eliminate contaminant-related concerns related to ecological receptors. The removal of the contaminated soils will also eliminate the source of the groundwater contamination. The groundwater extraction and treatment component of the selected remedy will eventually result in the groundwater meeting standards. The selected remedy will reduce exposure levels to protective ARAR levels or to within EPA's generally acceptable risk range of 10^{-4} to 10^{-6} for carcinogenic risk and below the HI of 1 for noncarcinogens. The implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts. The selected remedy will also provide overall protection by reducing the toxicity, mobility, and volume of contamination through the off-site treatment/disposal of the contaminated soils/sediments and the extraction/treatment of the contaminated groundwater.

Compliance with Applicable or Relevant and Appropriate Requirements of Environmental Laws

While there are no federal or New York State soil and sediment ARARs, one of the remedial action goals is to meet NYSDEC soil cleanup objectives. A summary of action-spectific, chemical-specific, and location-specific ARARs which will be complied with during implementation of the selected remedy is presented below.

Action-specific ARARs:

- National Emissions Standards for Hazardous Air Pollutants
- 6 NYCRR Part 257, Air Quality Standards
- 6 NYCRR Part 212, Air Emission Standards

- 6 NYCRR Part 373, Fugitive Dusts
- 40 CFR 50, Air Quality Standards
- State Permit Discharge Elimination System
- Resource Conservation and Recovery Act

Chemical-specific ARARs:

- Safe Drinking Water Act(SDWA) MCLs and MCLGs (40 CFR Part 141)
- 6 NYCRR Parts 700-705 Groundwater and Surface Water Quality Regulations
- 10 NYCRR Part 5 State Sanitary Code

Location-specific ARARs:

- Clean Water Act Section 404, 33 U.S.C. 1344
- Endangered Species Act of 1973, as amended (16 U.S.C. 1531)
- Fish and Wildlife Coordination Act, 16 U.S.C. 661
- National Historic Preservation Act, 16 U.S.C. 470
- New York State Freshwater Wetlands Law ECL, Article 24, 71 in Title 23
- New York State Freshwater Wetlands Permit Requirements and Classification, 6 NYCRR 663 and 664
- New York State Endangered and Threatened Species of Fish and Wildlife Requirements, 6 NYCRR 182

Other Criteria, Advisories, or Guidance To Be Considered (TBCs):

- Executive Order 11990 (Protection of Wetlands)
- Executive Order 11988 (Floodplain Management)
- EPA Statement of Policy on Floodplains and Wetlands Assessments for CERCLA Actions
- New York Guidelines for Soil Erosion and Sediment Control

- New York State Air Cleanup Criteria, January 1990
- SDWA Proposed MCLs and MCL Goals
- NYSDEC Technical and Operational Guidance Series 1.1.1, November 1991
- EPA Ambient Water Quality Criteria (Federal Register, Volume 57, No. 246, December 22, 1992)
- Technical Guidance for Screening Contaminated Sediments (January 1999), NYSDEC, Division of Fish and Wildlife, Division of Marine Resources
- Soil cleanup objectives specified in NYSDEC Technical Administrative Guidance Memorandum No. 94-HWR-4046.

Cost-Effectiveness

For the foregoing reasons, it has been determined that the selected remedy provides for overall effectiveness in proportion to its cost.

The estimated present-worth cost of the soil component of the selected remedy is $17,430,000.

Although Alternative SS-2 (excavation and on-site disposal of contaminated soils/sediments, excavation and off-site treatment/disposal of principal threat waste areas, and installation of a multilayer cap) is less costly than the selected remedy, containment of the contaminated soils and sediments would not achieve overall protection of human health and the environment. This conclusion is based on the determination that the reasonably-anticipated future land use of the site is residential and/or agricultural. The capping remedy would not adequately protect potential future site residents or consumers of vegetables grown on the property from the risks posed by the contamination to be left at the site under this alternative. In addition, Alternative SS-2 would only marginally meet CERCLA's preferences for treatment, and would be a permanent remedial solution for only a small fraction of the contaminated soils/sediments.

Although Alternative SS-4, on-site incineration, would be as protective of public health and the environment as the selected remedy and it would offer a higher degree of volume reduction through treatment than the selected remedy, on-site incineration would be substantially more costly and would take longer to implement.

The estimated present-worth cost of the groundwater component of the selected remedy is $2,947,000. While the selected remedy is the most

costly of the groundwater alternatives, it includes active treatment of the contaminated groundwater and would restore the aquifer to drinking water quality in a substantially shorter time frame than the Alternatives GW-1 (no action) and GW-2 (monitored natural attenuation).

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B), such that it represents the maximum extent to which permanence and treatment can be practicably utilized at this site.

The selected remedy will provide a permanent solution for the contaminated soils and sediments by removing them from the Site for off-site treatment/disposal. Although on-site incineration would offer a higher degree of volume reduction through treatment than the selected remedy, on-site incineration would be substantially more costly and would take longer to implement than off-site treatment/disposal. Incineration would also be more difficult to implement and would not likely be accepted by the public.

With regard to the groundwater, the selected remedy will provide a permanent remedy and will employ treatment technologies to reduce the toxicity, mobility, and volume of the contaminants in the groundwater.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied under the selected remedy in that contaminated soils and sediments would be removed from the Site for treatment/disposal and treatment would be used to reduce the volume of contaminated groundwater in the aquifer.

Five-Year Review Requirements

The selected remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. However, it may take more than five years to attain remedial action objectives and cleanup levels for the groundwater. Consequently, a policy review may be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

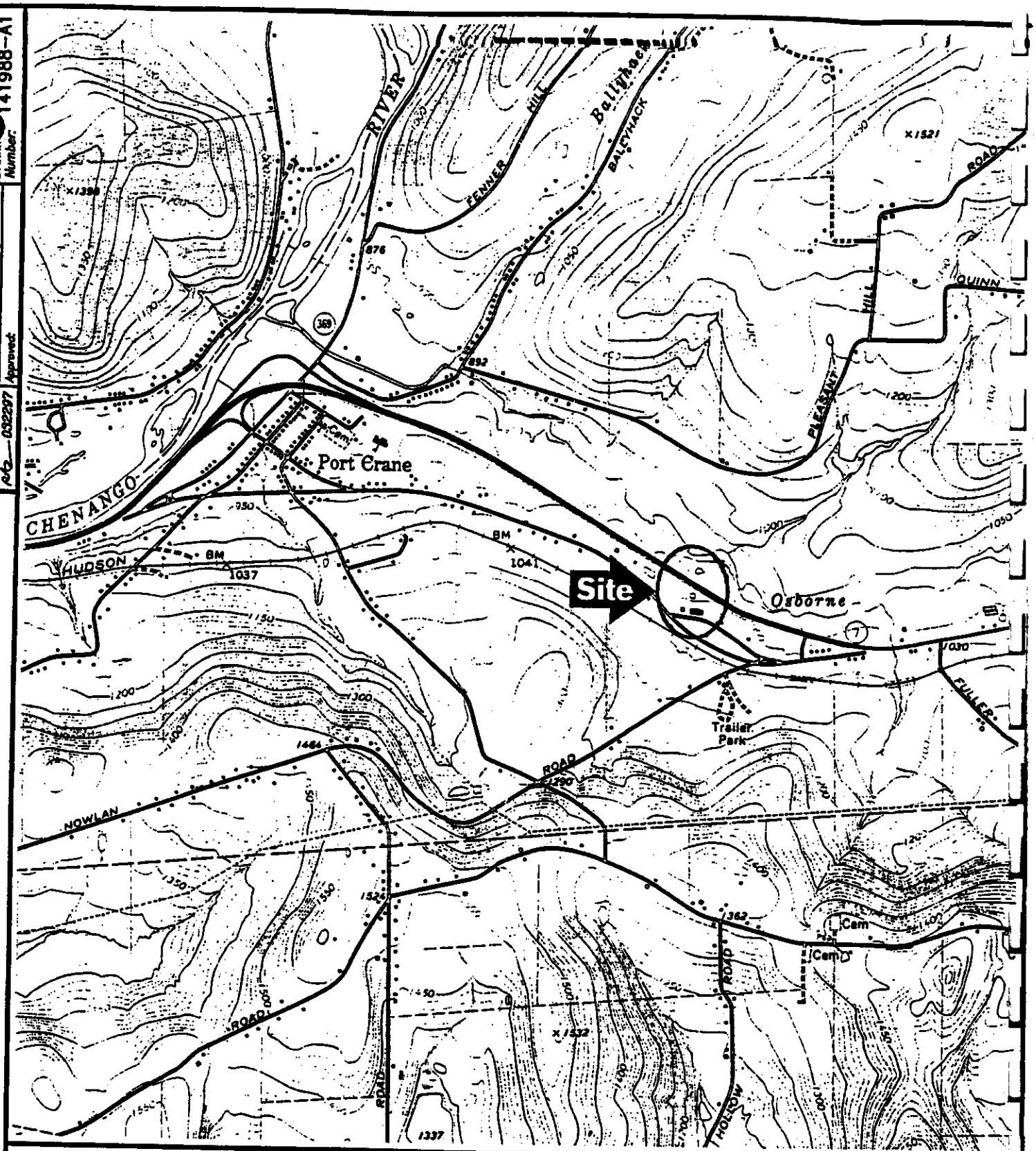
The Proposed Plan, released for public comment in January 2000, identified Alternative SS-3, excavation of contaminated soils/sediments and off-site treatment/disposal and Alternative GW-3, extraction and treatment to address the contaminated groundwater, as the preferred remedy. Based upon its review of the written and verbal comments submitted during the public comment period, EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

APPENDIX I

FIGURES

APPENDIX I

FIGURES



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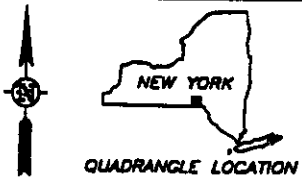

ENVIRONMENTAL STRATEGIES CORPORATION Four Penn Center West, Suite 315 Pittsburgh, Pennsylvania 15276 (412) 787-5100	FIGURE 1-1 SITE LOCATION MAP	TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK

Drawn By: ajb 032397 | Checked: | Approved: | Drawing Number: 141988-A1

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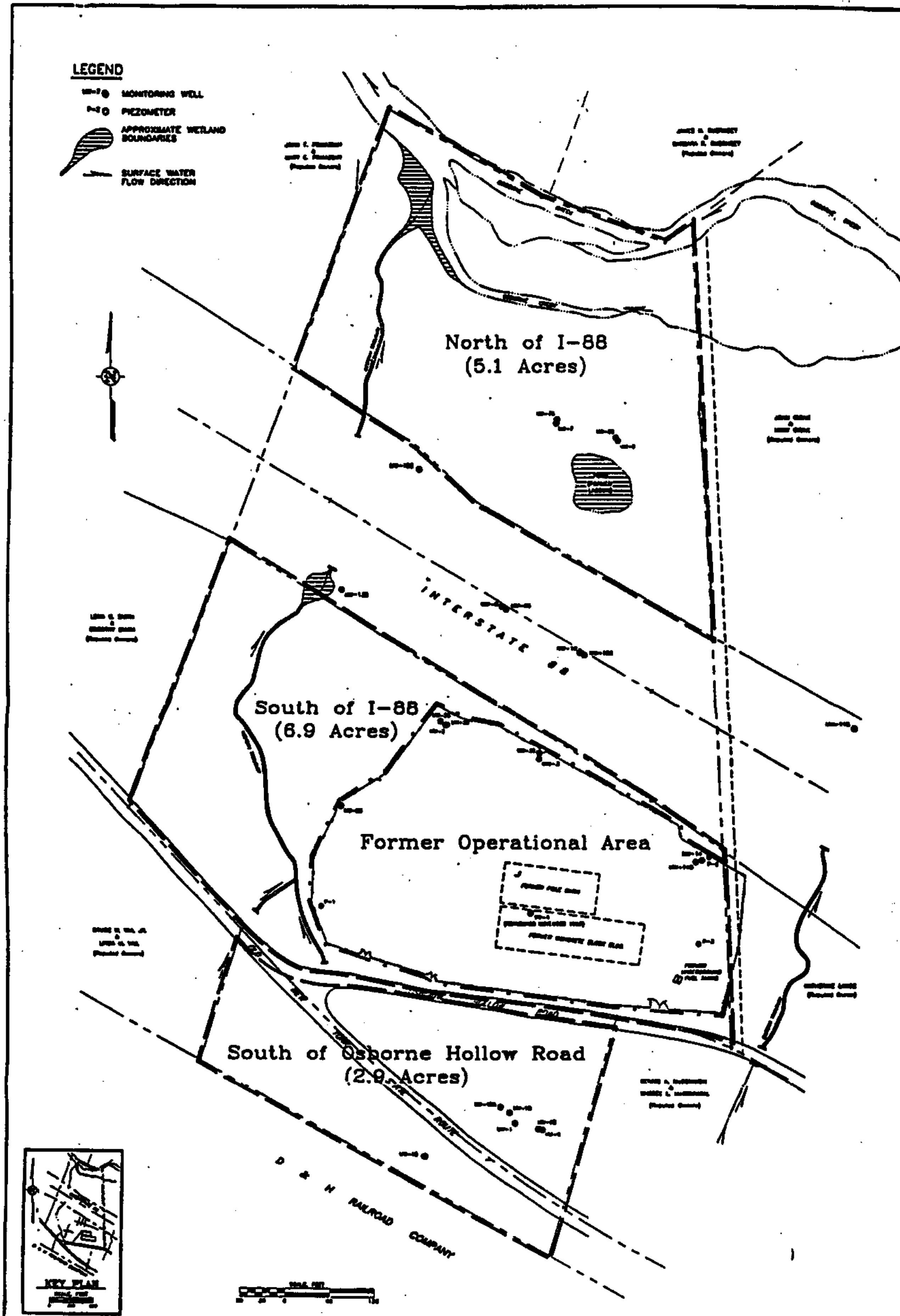

FIGURE 2-1

Date: 030497
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Design: KBJ
Checked: KBJ
File: 141988-B62

SITE LAYOUT

TRI-CITIES BARREL SUPERFUND SITE
FENTON, NEW YORK

Revision

Date	Description	By

ESC

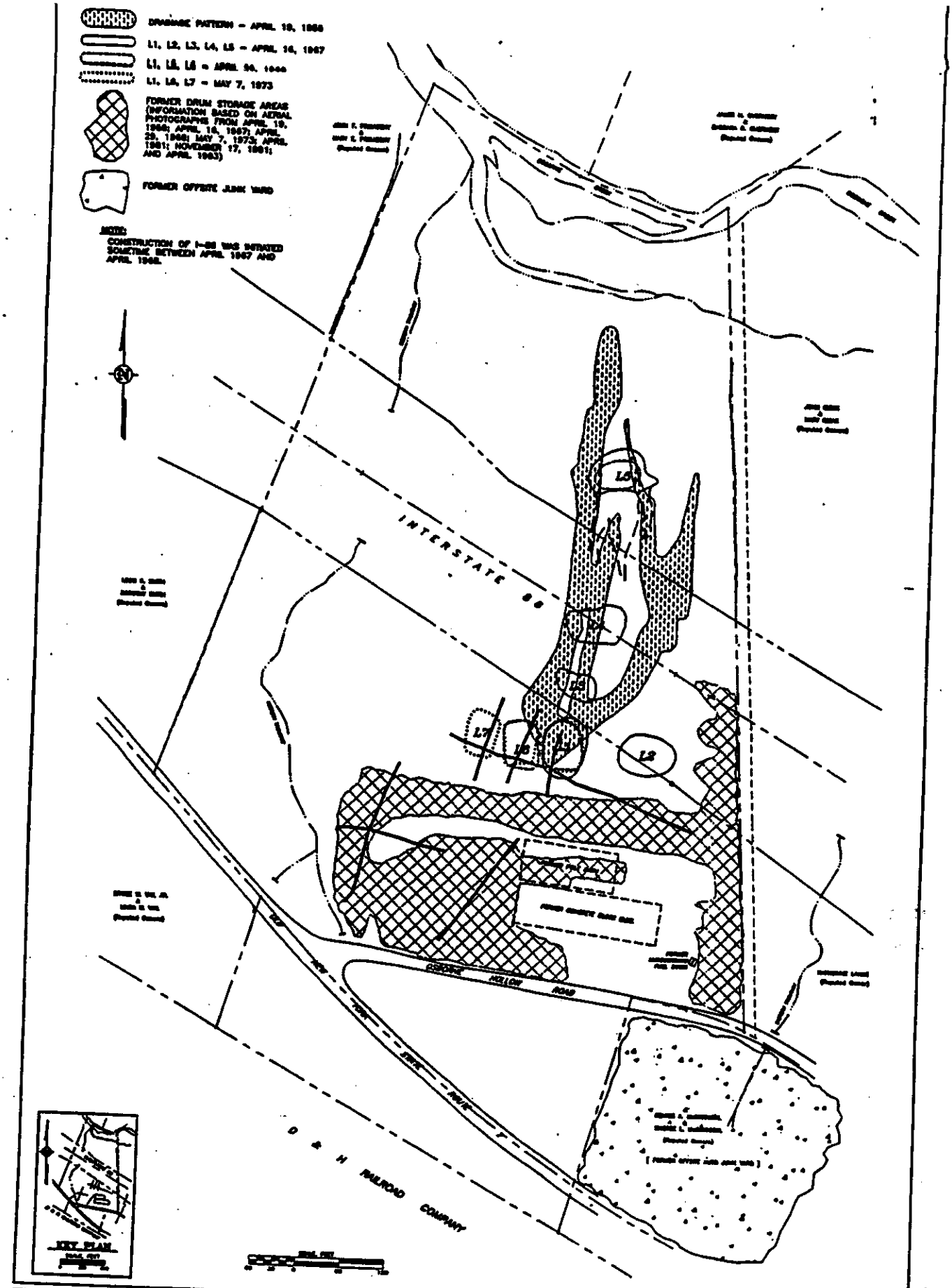

FIGURE 3-1	Date: 030407 Scale: AS SHOWN Design: KBJ Drawn: AMZ Checked: KBJ File: 141988-003	LOCATIONS OF FORMER LAGOONS, SURFICIAL DISCHARGE PATTERNS, AND DRUM STORAGE AREAS TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By

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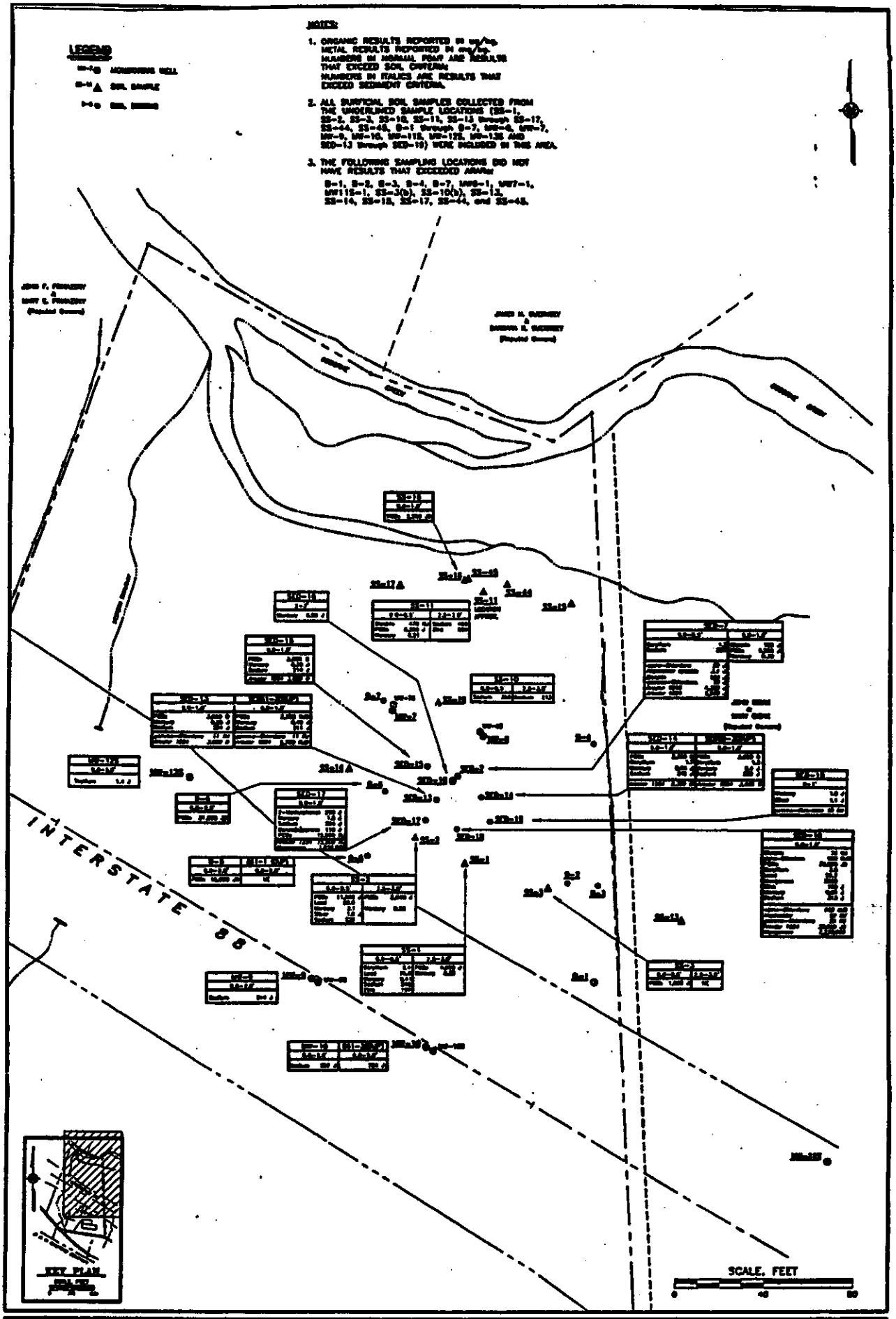


FIGURE 4-1	Date: 032997 Scale: AS SHOWN Design: KBJ Drawn: AC Checked: KBJ File: 141660-079	REMEDIAL INVESTIGATION SURFICIAL SOIL SAMPLING RESULTS THAT EXCEED ARARs (NORTH of I-88) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By	ESC

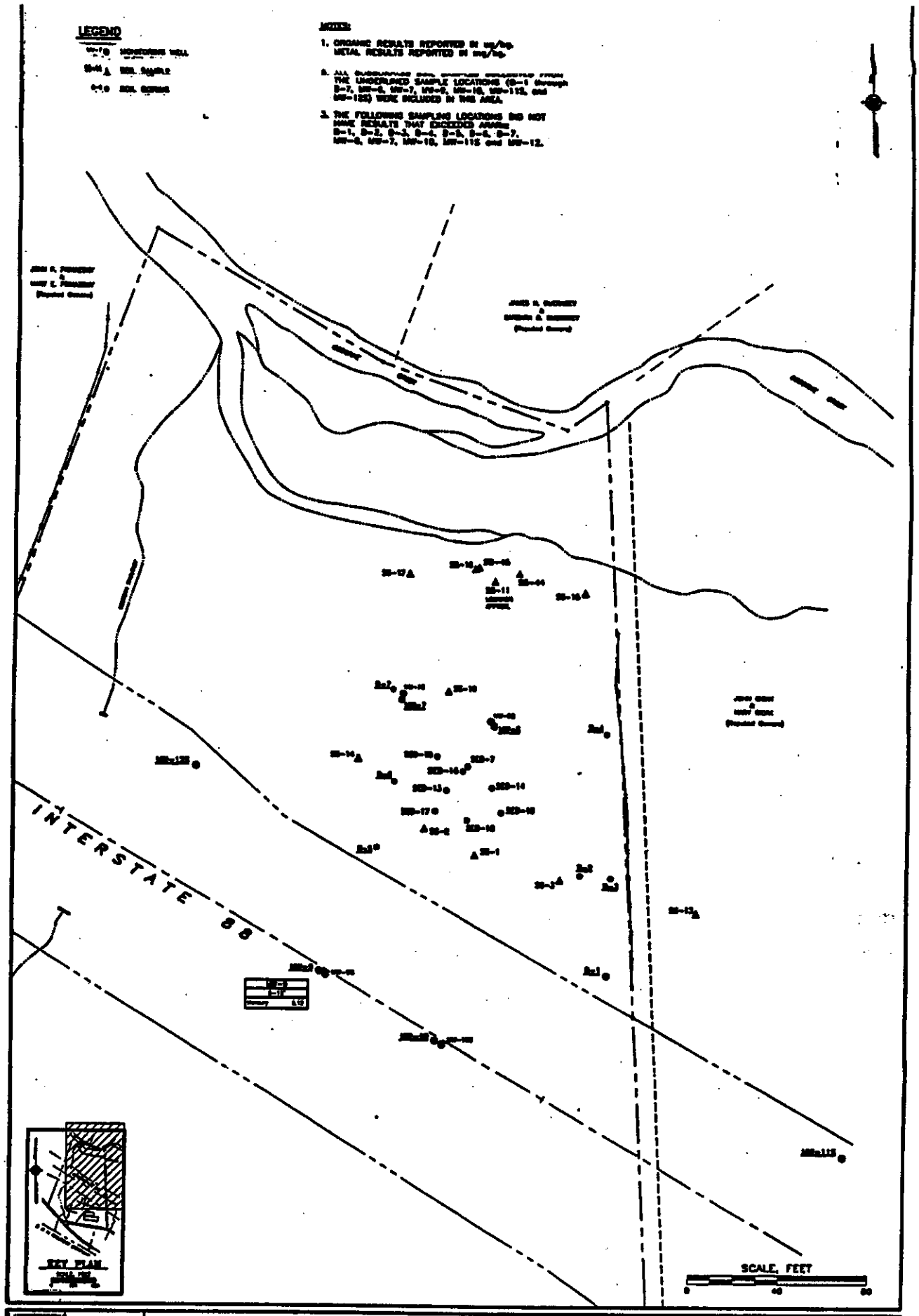


FIGURE 4-2	Date: 6/28/97 Scale: AS SHOWN Design: KBJ Drawn: AMC Checked: KBJ File: 141985-880	REMEDIAL INVESTIGATION SUBSURFACE SOIL SAMPLING RESULTS THAT EXCEED ARARs (NORTH of I-86) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By	ESC

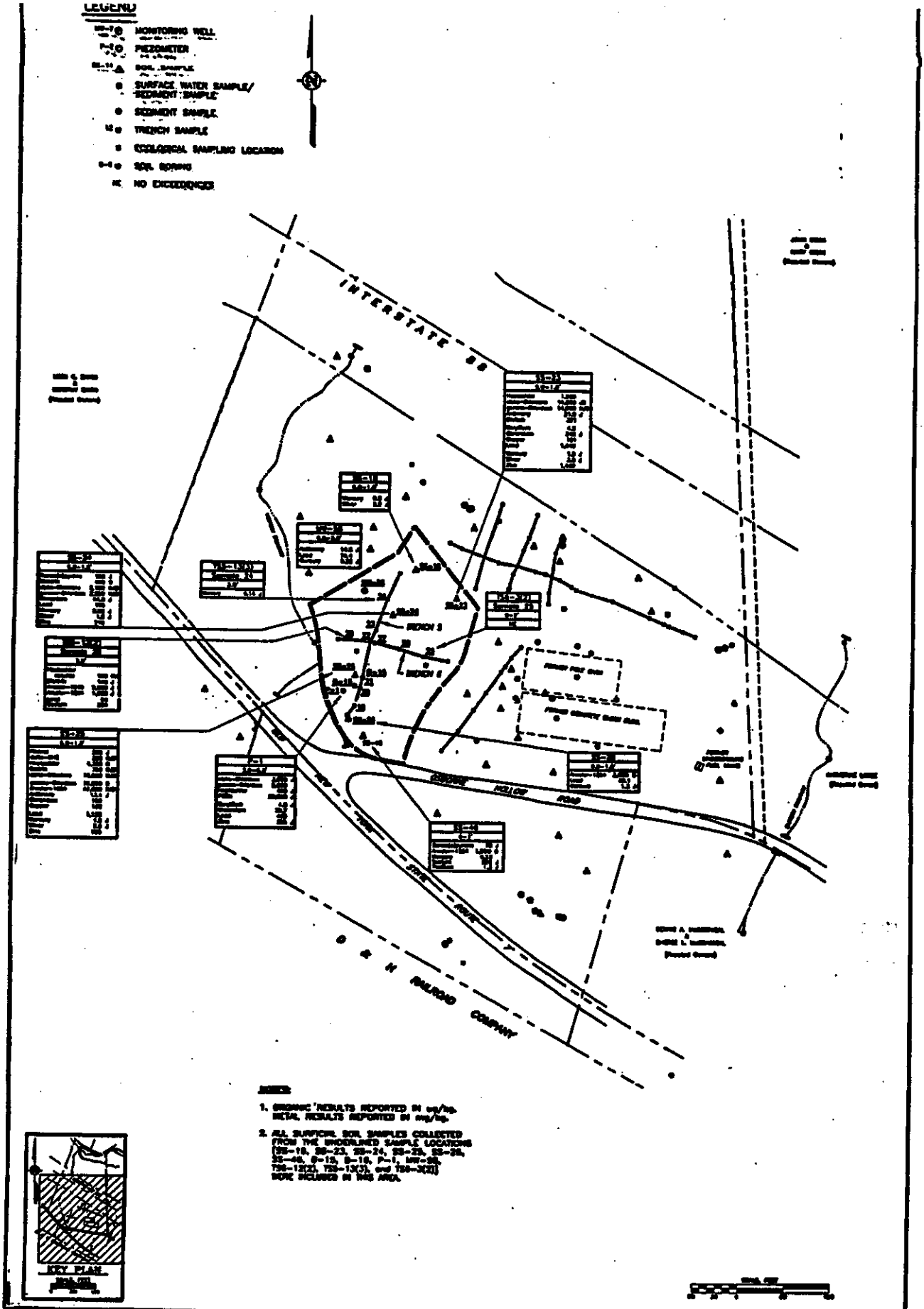
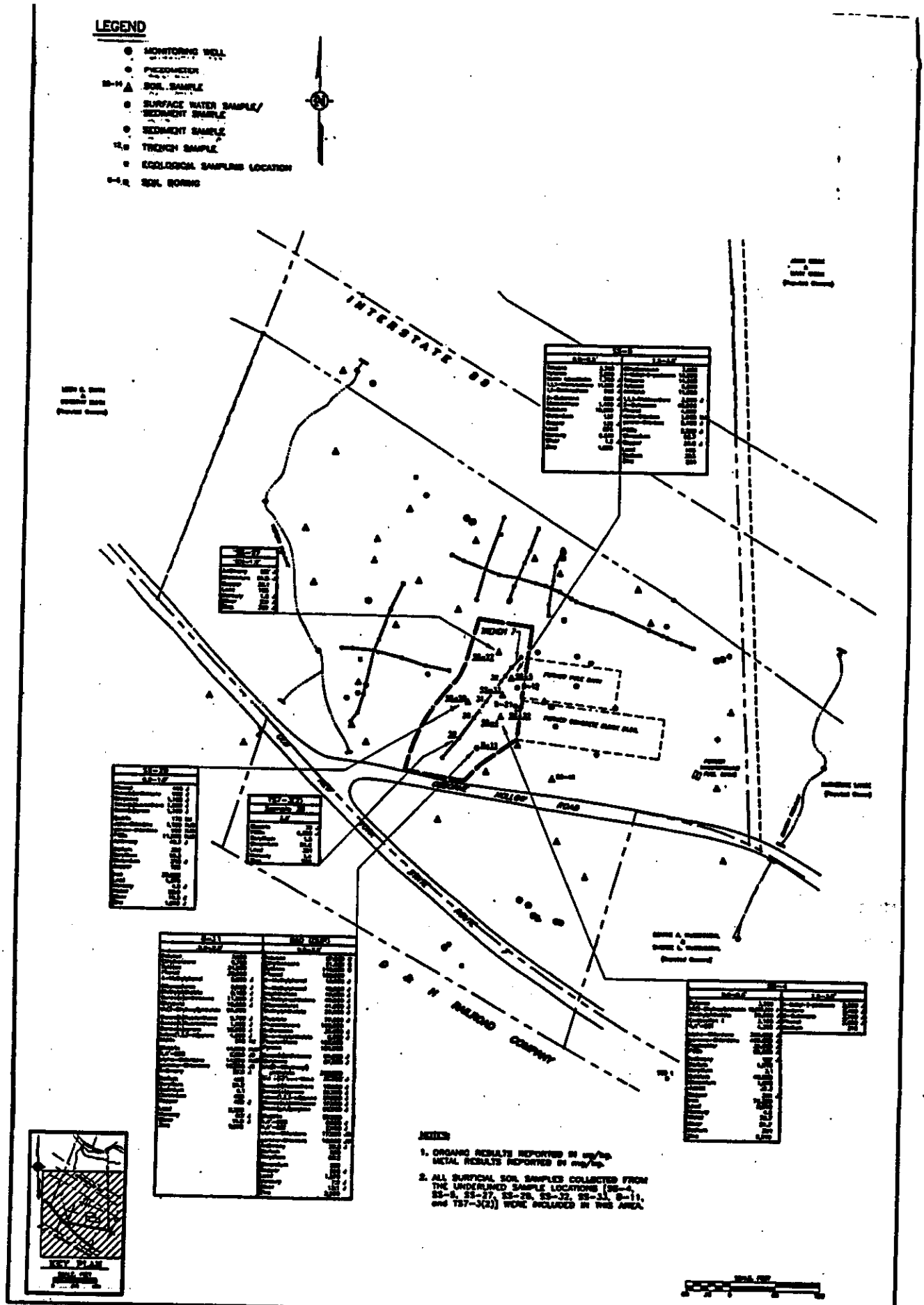


FIGURE 5-1	Date: 010397 Checked: KBJ File: 141988-B47	FORMER INCOMING DRUM STORAGE AREA SURFICIAL SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-88) TRI-CITIES BARREL SUPERFUND SITE TENTON, NEW YORK	Revision Date / Description / By

ESC



NOTES

1. ORGANIC RESULTS REPORTED IN ug/kg
METAL RESULTS REPORTED IN mg/kg

2. ALL SURFICIAL SOIL SAMPLES COLLECTED FROM THE UNDERLINED SAMPLE LOCATIONS (SB-4, SS-5, SS-27, SS-28, SS-32, SS-33, B-11, and TST-3(2)) WERE INCLUDED IN THIS AREA.

FIGURE 5-2

FORMER DRUM PROCESSING AREA
SURFICIAL SOIL SAMPLING RESULTS
THAT EXCEED ARARs (SOUTH of I-86)

TRI-CITIES BARREL SUPERFUND SITE
FENTON, NEW YORK

Revision

Date	Description	By

ESC

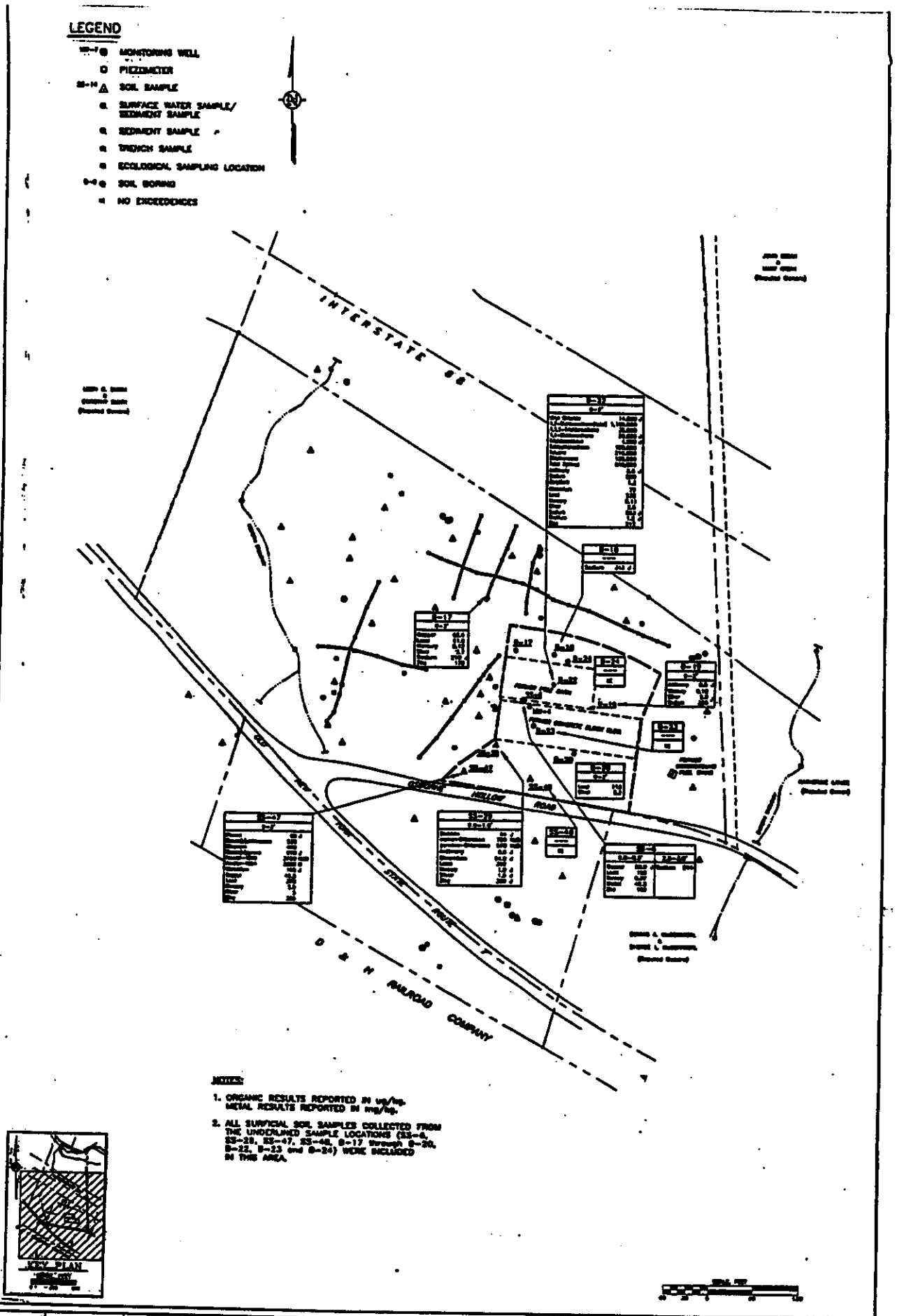
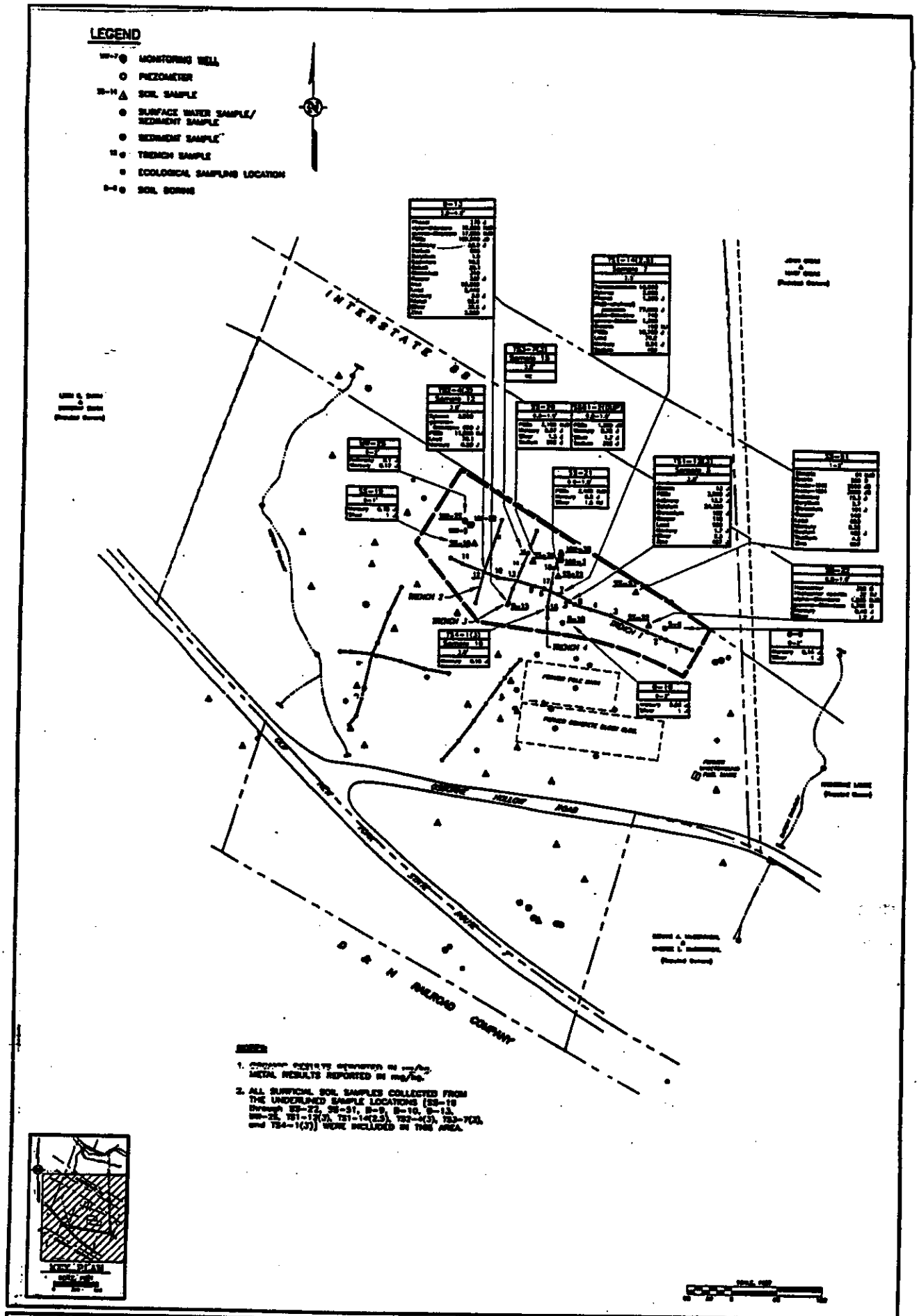


FIGURE 5-3	Date 010297 Scale AS SHOWN Designer MHD Drawn Checked KBJ File 141988-044	FORMER PROCESS BUILDING AREA SURFICIAL SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-88) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By

ESC



NOTES

1. CONCENTRATIONS REPORTED IN mg/kg. METAL RESULTS REPORTED IN mg/kg.
2. ALL SURFICIAL SOIL SAMPLES COLLECTED FROM THE UNDERLINED SAMPLE LOCATIONS [SS-10 through SS-22, SS-31, B-9, B-10, B-13, SS-23, SS-17(3), TS1-1(12.5), TS2-4(3), TS3-7(3), and TS4-1(3)] WERE INCLUDED IN THIS AREA.

FIGURE 5-4	Date: 010397 Scale: AS SHOWN Designer: MHD Drawn: Checked: KBJ File: 141888-845	FORMER LAGOON AREA SURFICIAL SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-86) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By

ESC

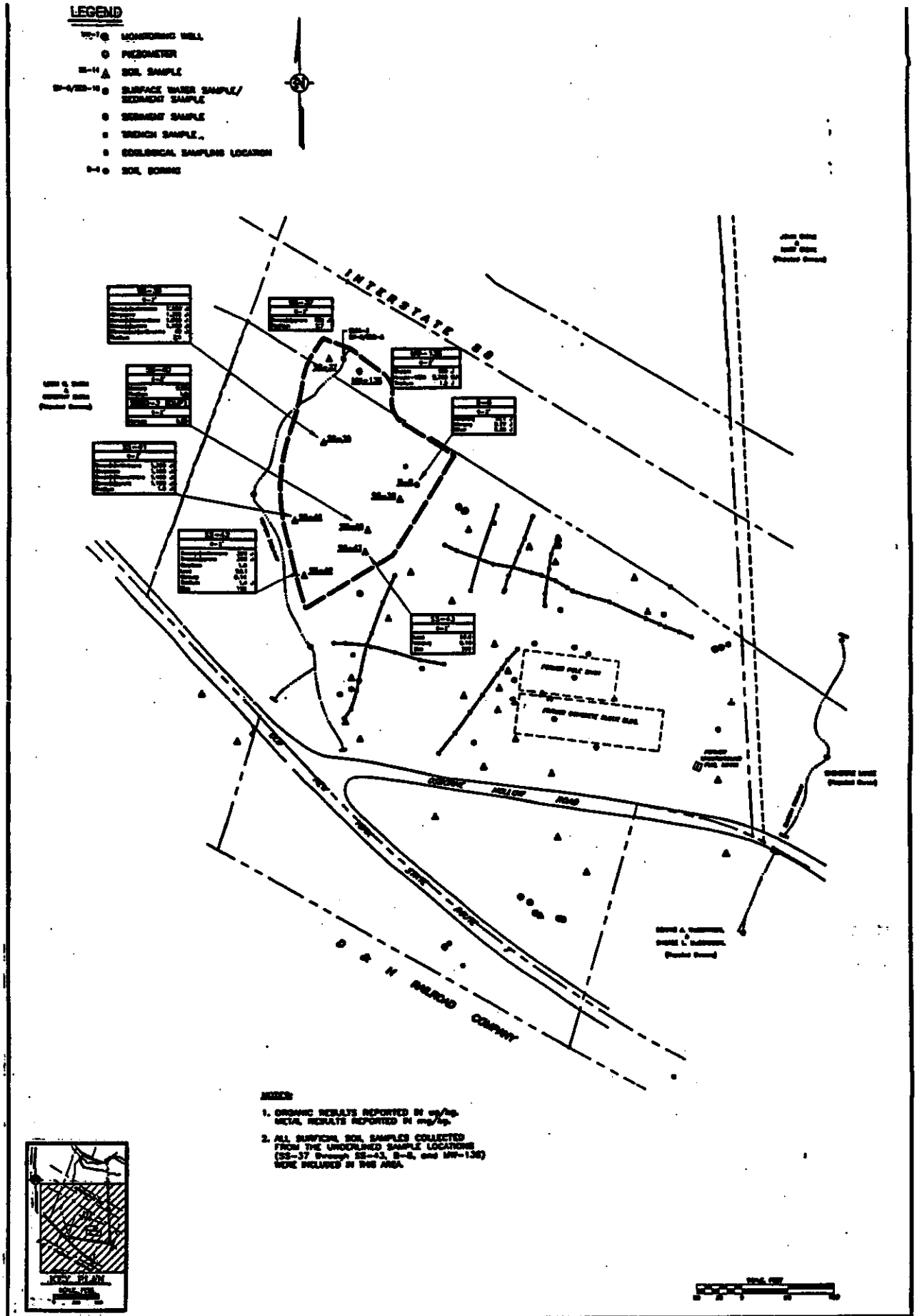
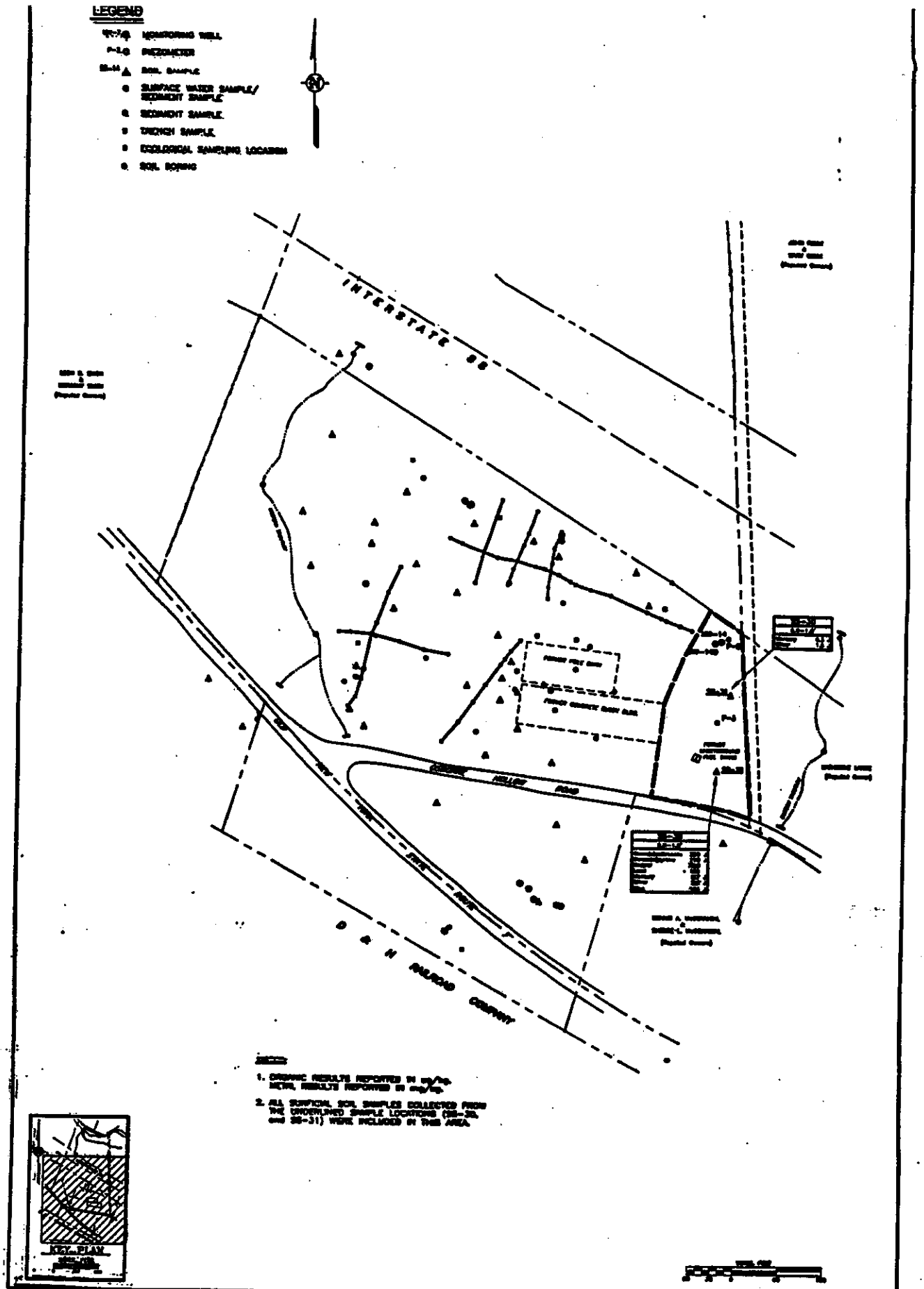


FIGURE 5-5	Date: 03/2007 Drawn: AS SHOWN Designed: KBJ Drawn: Checked: KBJ File: 141988-049	DOWNSLOPE OF THE FORMER INCOMING DRUM STORAGE AND LAGOON AREAS SURFICIAL SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-86) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By



NOTES:

1. ORGANIC RESULTS REPORTED IN µg/kg METAL RESULTS REPORTED IN mg/kg
2. ALL SURFICIAL SOIL SAMPLES COLLECTED FROM THE UNDERLINED SAMPLE LOCATIONS (SB-30 and SB-31) WERE INCLUDED IN THIS AREA.

FIGURE 5-6	Date 010397 Scale AS SHOWN Designer MHD Drawn Checked KBJ Dir. 141988-048	FORMER RECONDITIONED DRUM STORAGE AREA SURFICIAL SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-86) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By	SEAL ESC

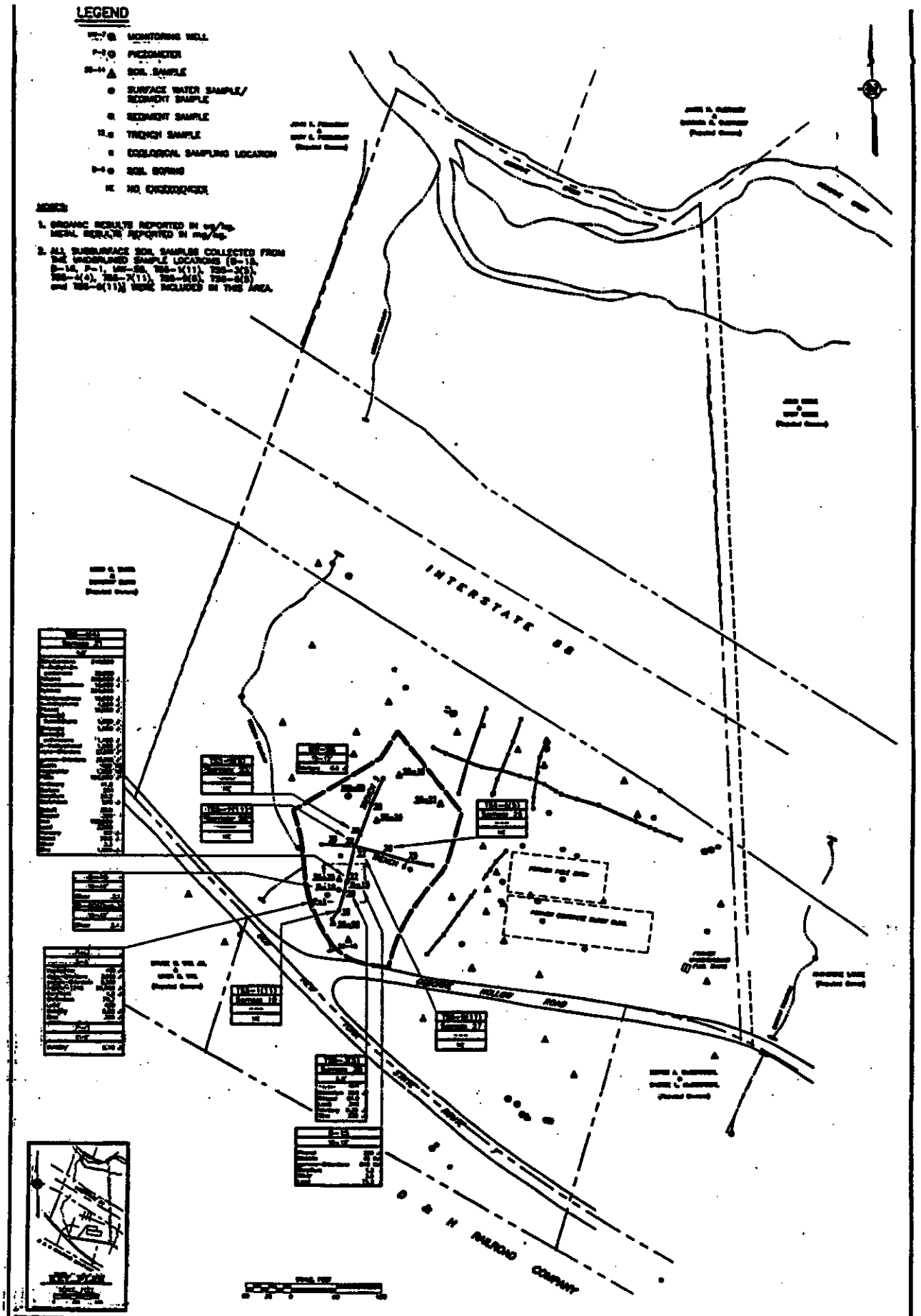


FIGURE 5-7	Date: 011397 Scale: AS SHOWN Designer: MRO Drawn: Checked: KEJ File: 141988-059	FORMER INCOMING DRUM STORAGE AREA SUBSURFACE SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-88) THE-CITIES BARREL SUPERFUND SITE PENFIELD, NEW YORK	Revision Date / Description / By SEAL	ESC

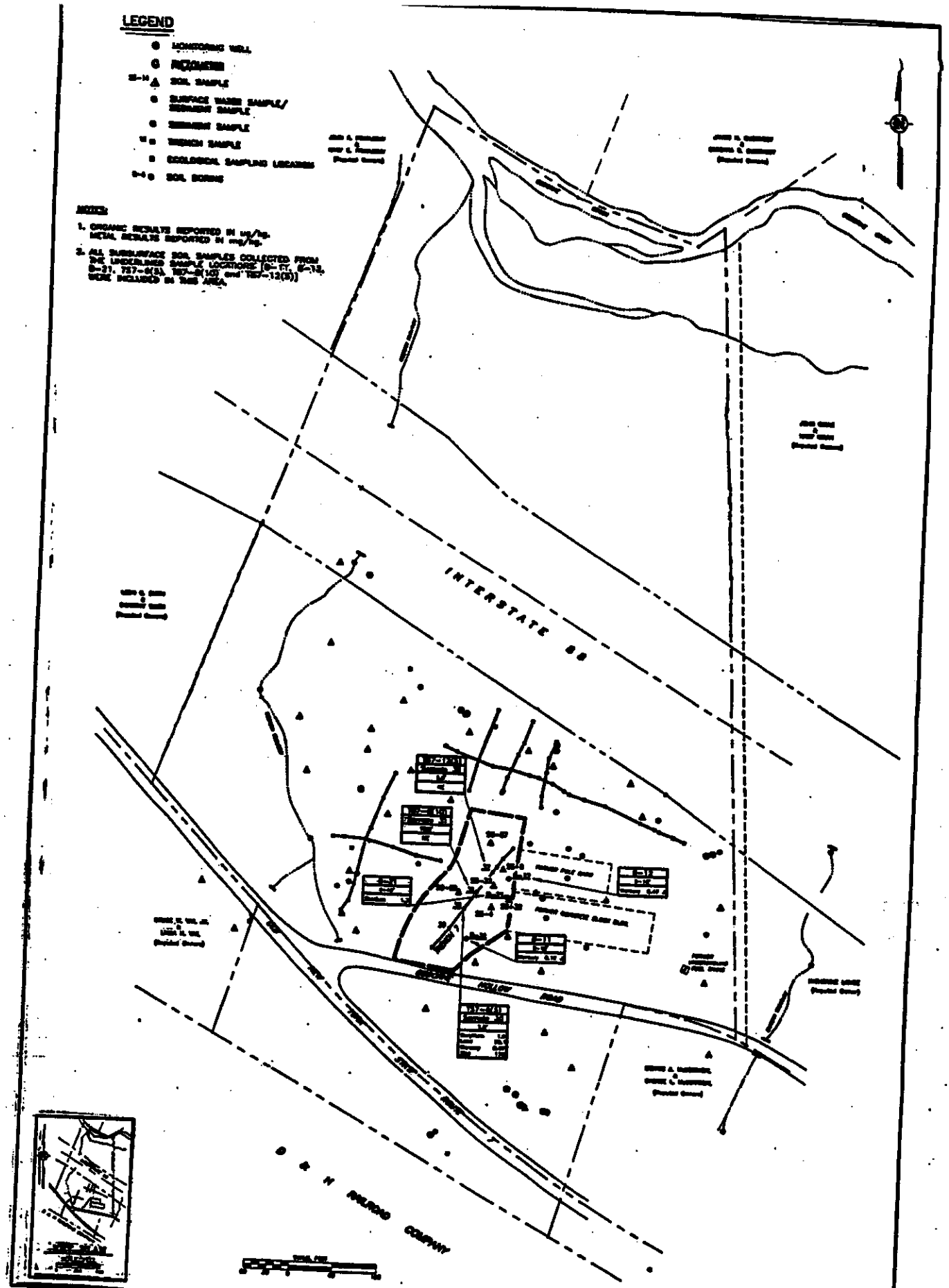


FIGURE 5-8	Date: 011397 Scale: AS SHOWN Design: MHD Drawn: Checked: KBJ Doc.: 41988-004	FORMER DRUM PROCESSING AREA SUBSURFACE SOIL SAMPLING RESULTS TRNT EXCEED ARARs (SOUTH of I-88) THE CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By

ESC

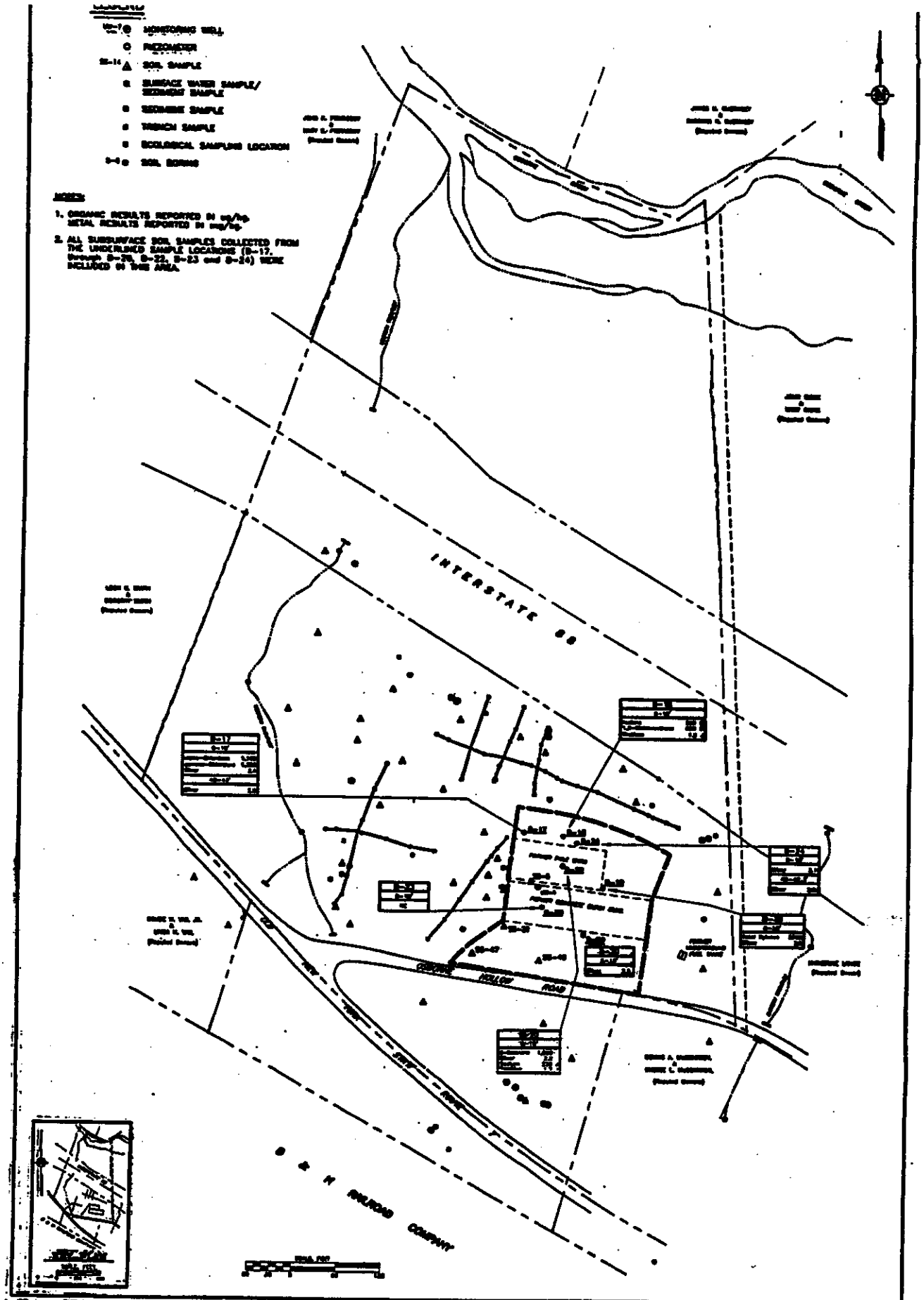


FIGURE 5-9	Date 011297 Scale AS SHOWN Design MHO Drawn AKZ Checked KBJ File 141988-BS2	FORMER PROCESS BUILDING AREA SUBSURFACE SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-88) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By SEAL ESC

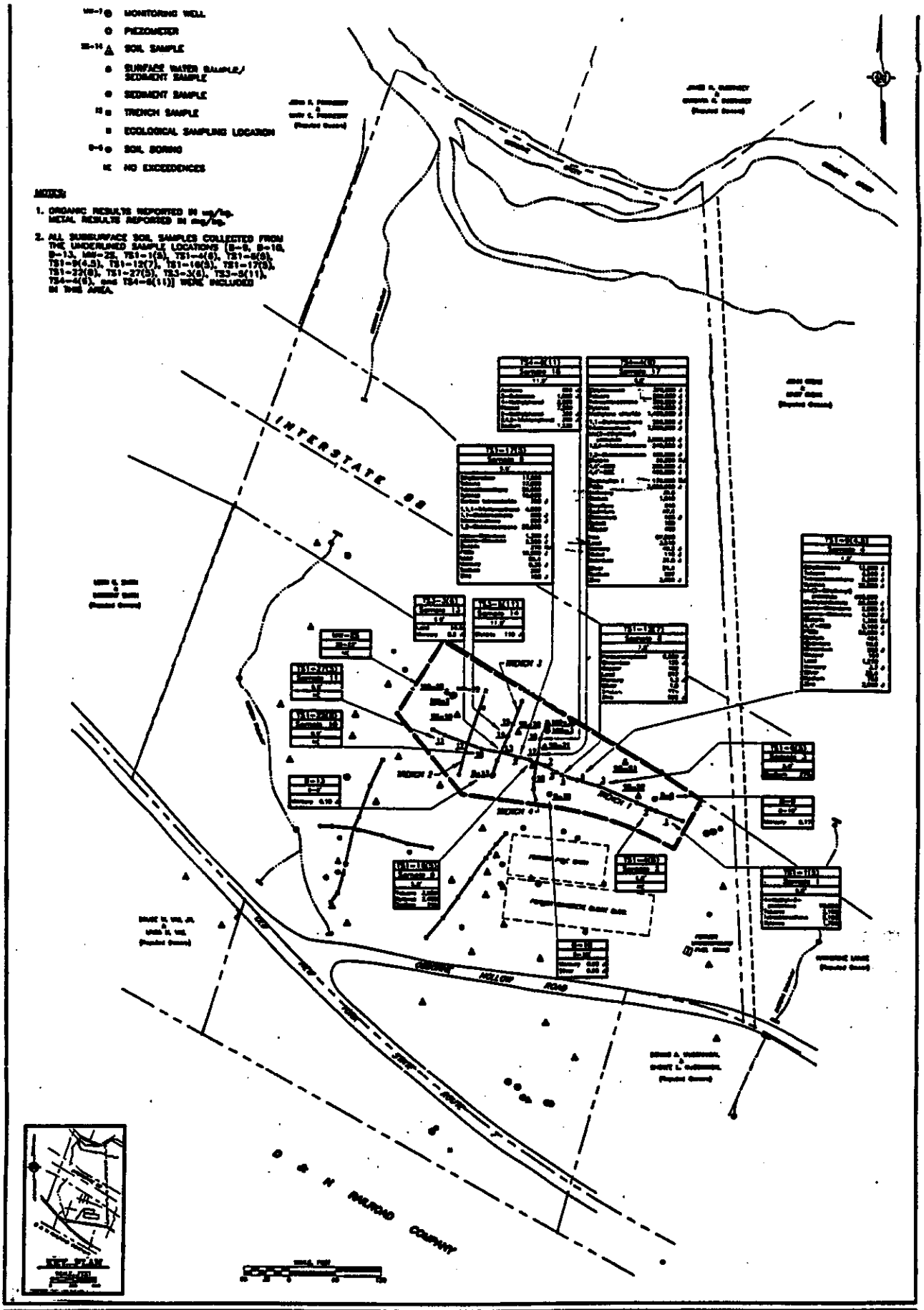


FIGURE 5-10	Date 011287 Scale AS SHOWN Designer MHD Drawn Checked KBJ File 441988a853	FORMER LAGOON AREA SUBSURFACE SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-88) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By

SEAL

ESC

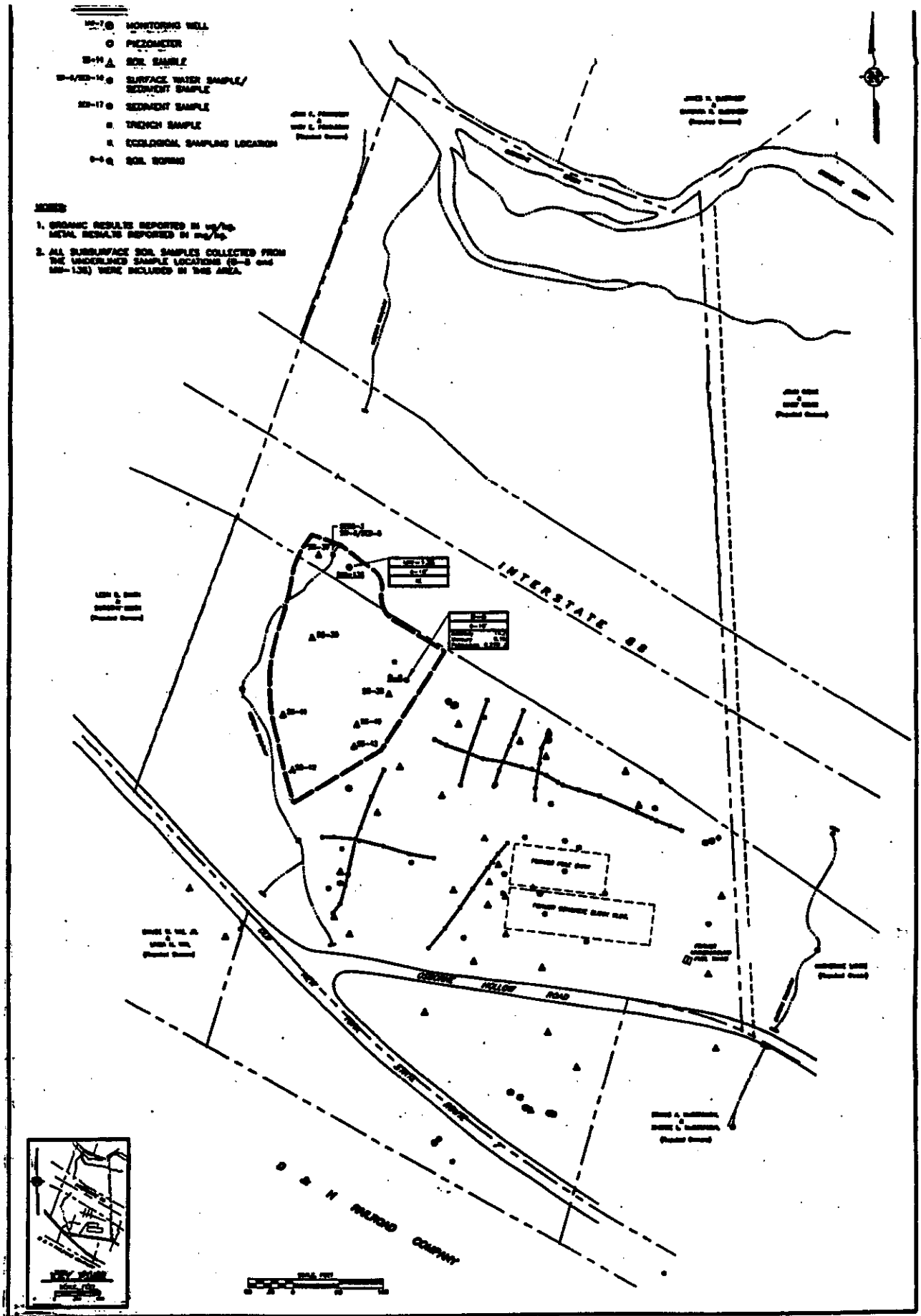


FIGURE 5-11	Date: 011397 Scale: AS SHOWN Design: MHD Drawn: AAZ Checked: KBJ File: 141808-057	DOWNSLOPE OF FORMER INCOMING DRUM STORAGE AND LAGOONS AREAS SUBSURFACE SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-88) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By SEAL

ESC

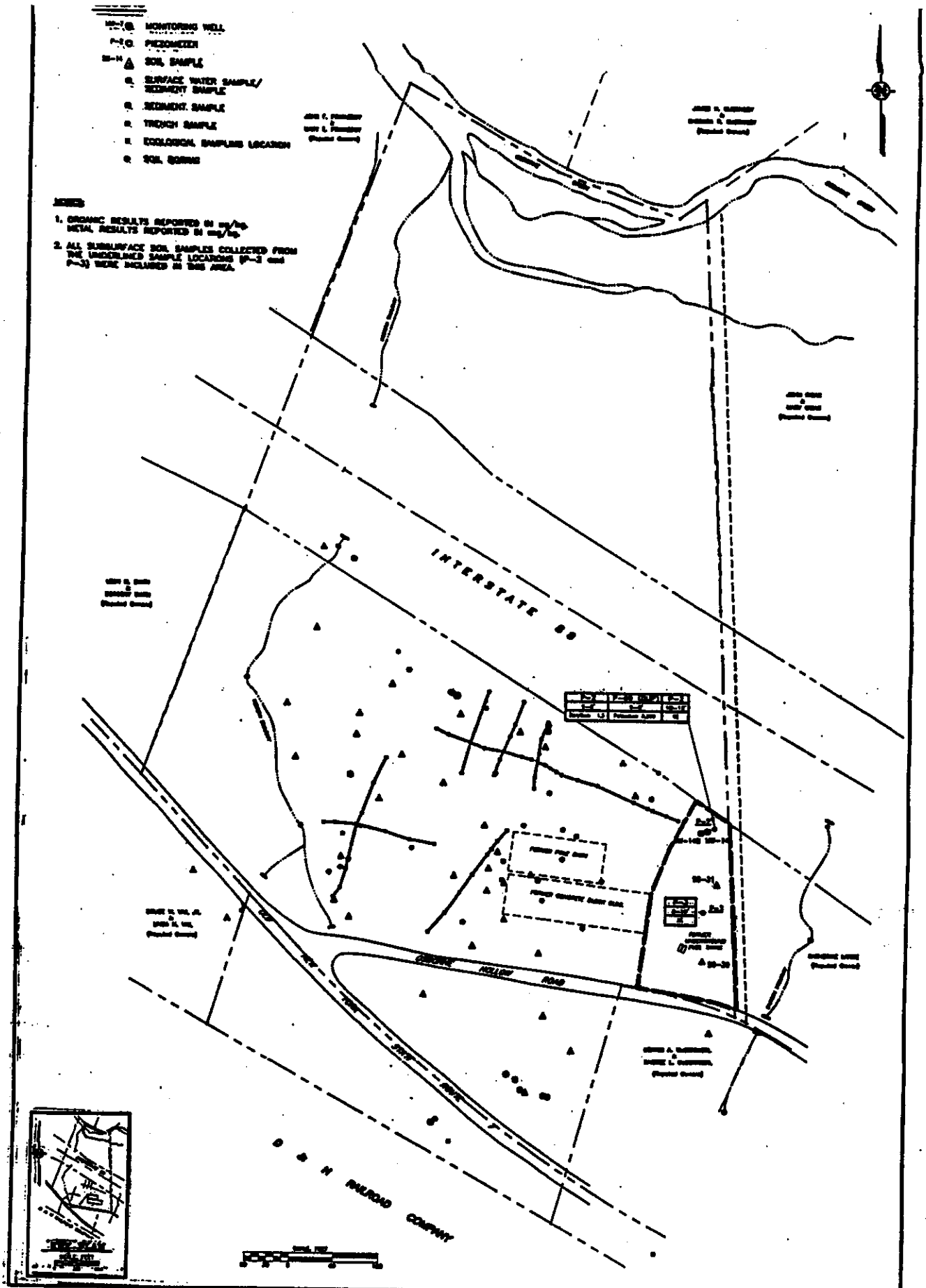


FIGURE 5-12	Date: 011397 Scale: AS SHOWN Design: MHD Drawn: Checked: KBJ File: 141988.856	FORMER RECONDITIONED DRUM STORAGE AREA SUBSURFACE SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH of I-80)	Revision Date / Description / By
		TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	SEAL
			ESC

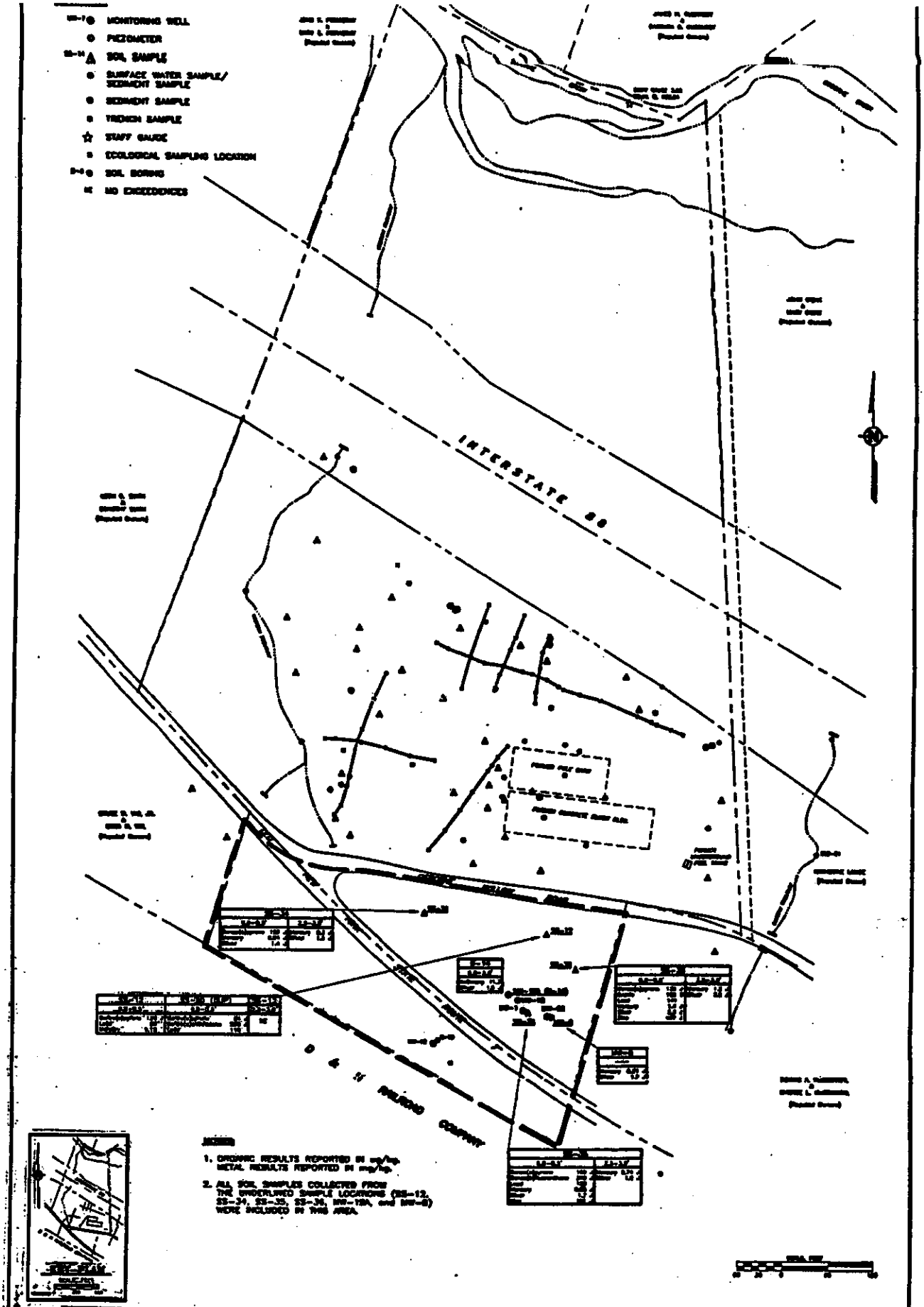


FIGURE 6-1	Date: 011297 Scale: AS SHOWN Design: MHD Drawn: AG Checked: KBJ Proj.#141005-051	PHASE I AND PHASE II SURFICIAL SOIL SAMPLING RESULTS THAT EXCEED ARARs (SOUTH OF OSBORNE HOLLOW ROAD) TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By

ESC

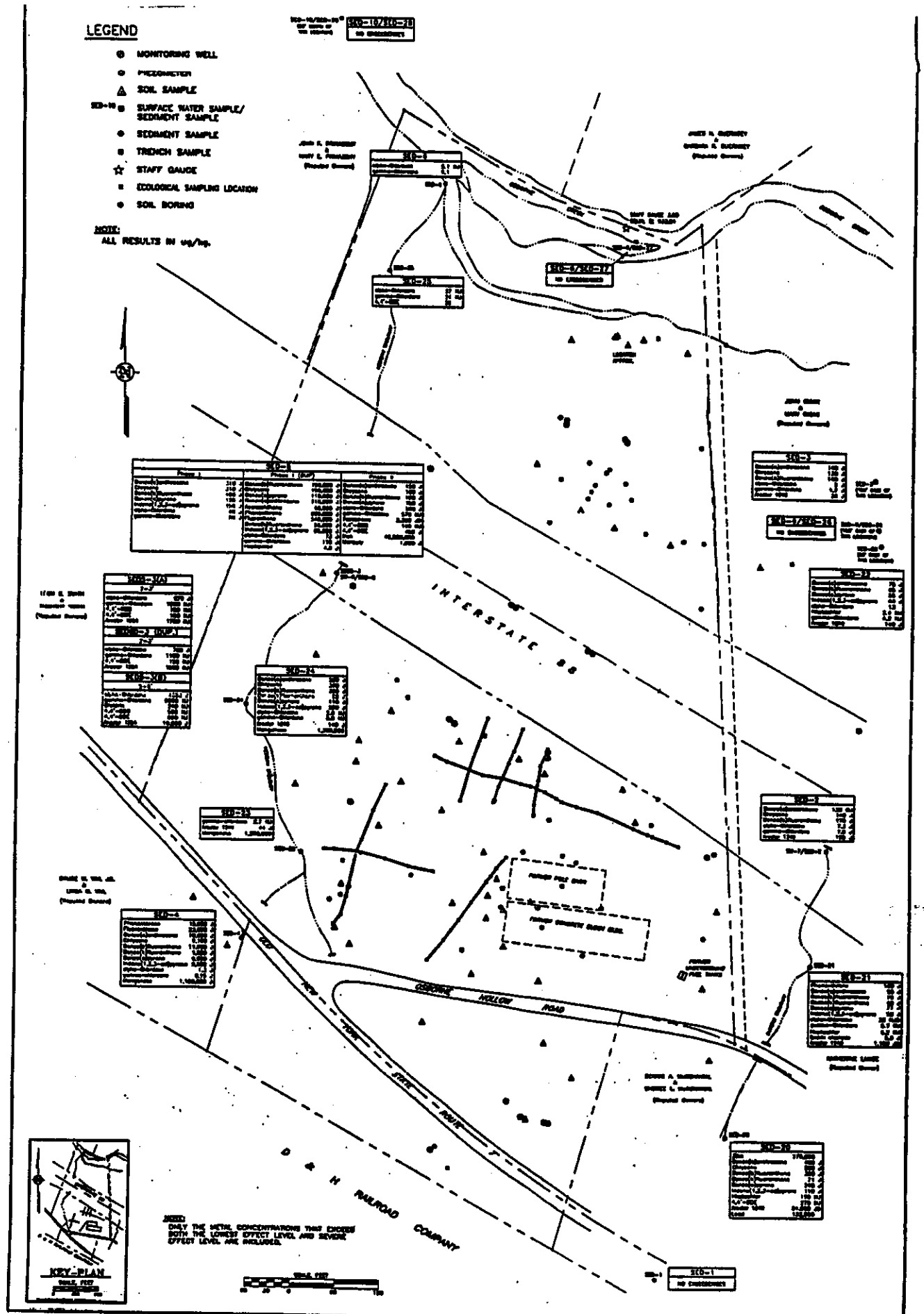


FIGURE 7-1	Date: 031997 Scale: AS SHOWN Design: KBJ Drawn: RRZ Checked: KBJ File: 141988-B74	REMEDIAL INVESTIGATION SEDIMENT SAMPLING RESULTS THAT EXCEED ARARs TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By

ESC

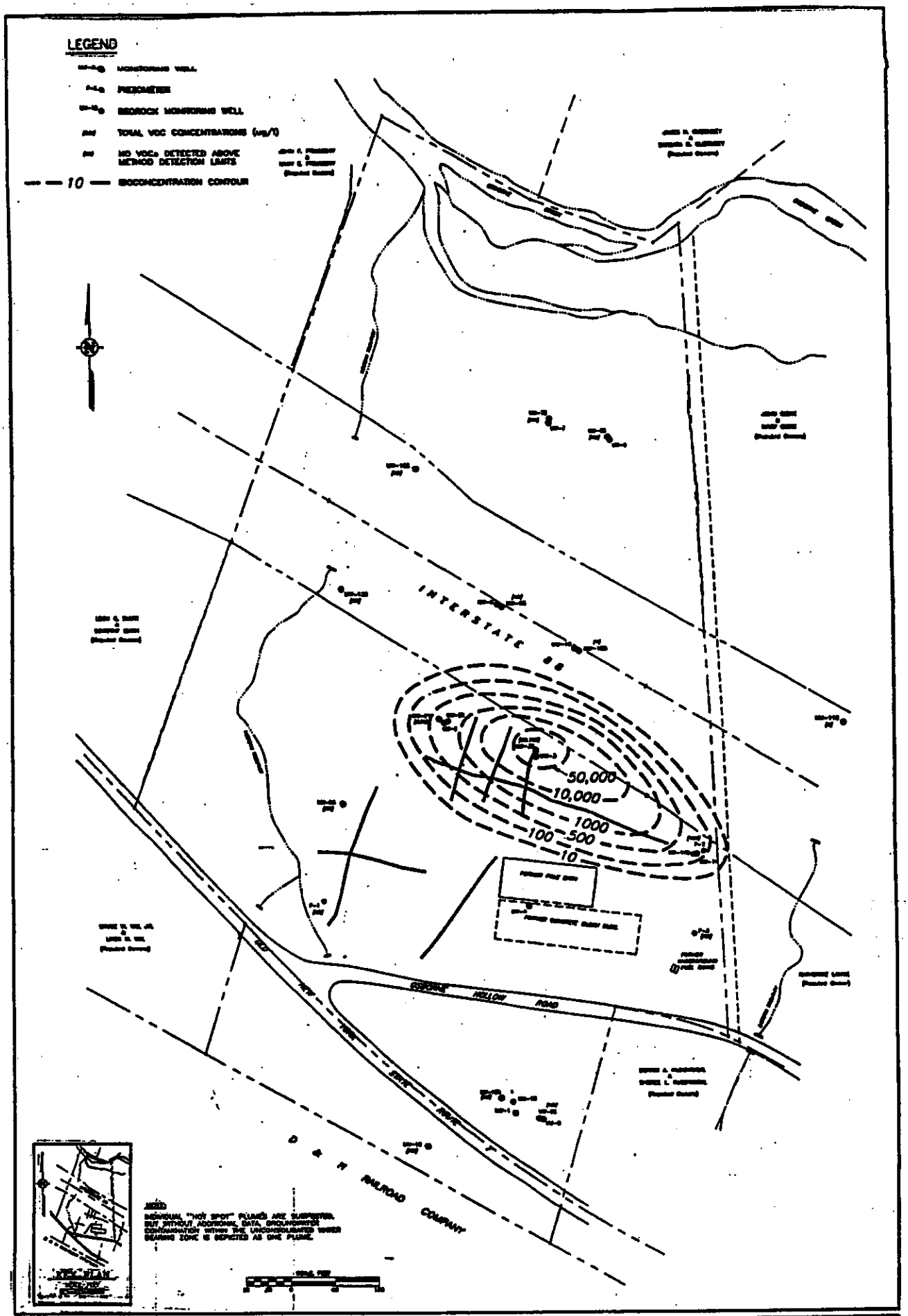


FIGURE 8-1	Date: 03/30/97 Scale: AS SHOWN Design: MHD Drawn: Checked: KBJ File: 41885-R102	TOTAL VOC ISOPLETH MAP OF THE PHASE III REMEDIAL INVESTIGATION GROUNDWATER SAMPLING RESULTS FOR THE UPPER PORTION OF THE UNCONSOLIDATED WATER BEARING ZONE TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By SEAL ESC

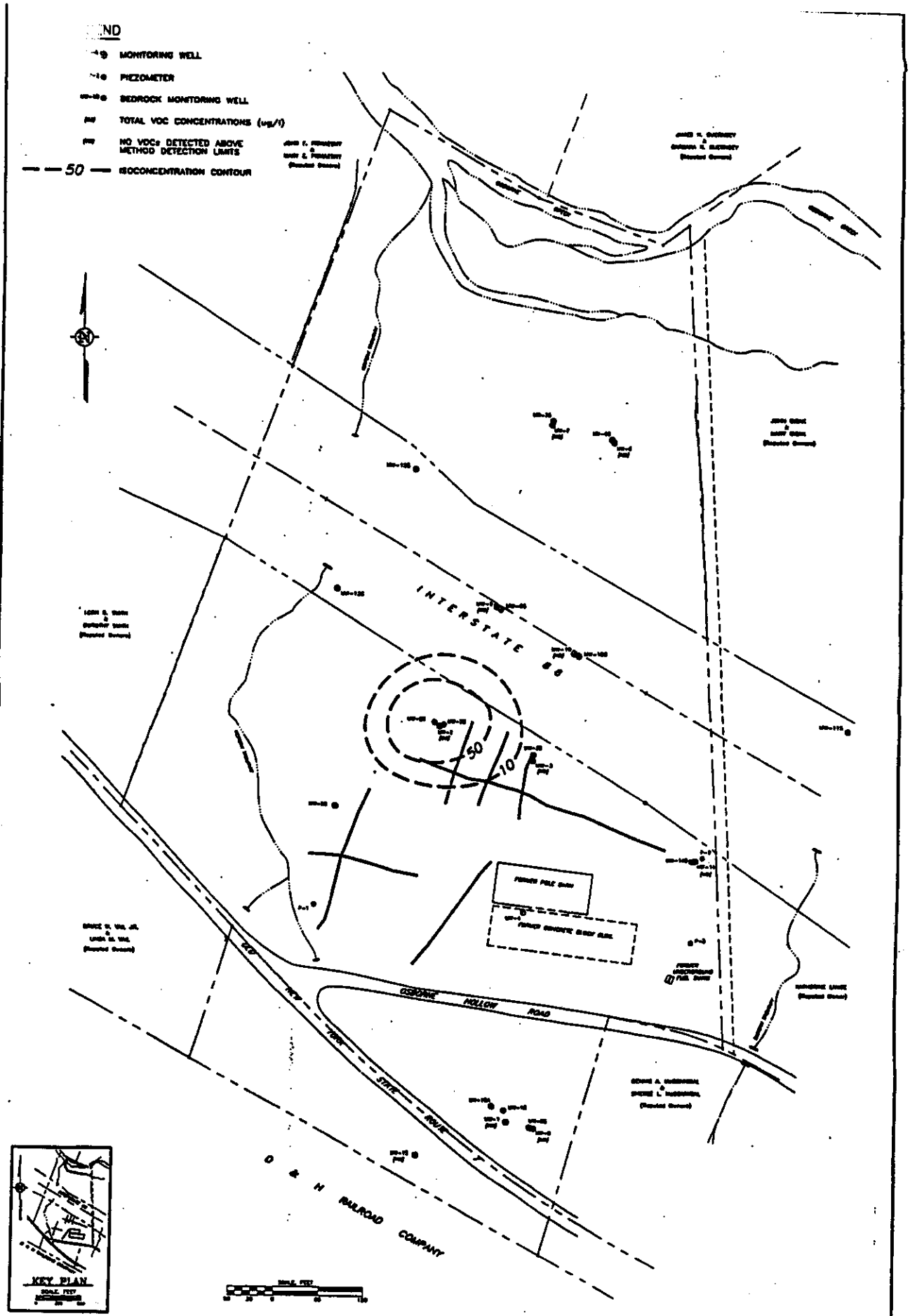


FIGURE 8-2	Date: 030397 Scale: AS SHOWN Designer: MHD Drawn: [illegible] Checked: KBJ File:141988-8101	TOTAL VOC ISOPLETH MAP OF THE PHASE III REMEDIAL INVESTIGATION GROUNDWATER SAMPLING RESULTS FOR THE LOWER PORTION OF THE UNCONSOLIDATED WATER BEARING ZONE TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By	SEAL ESC

302345

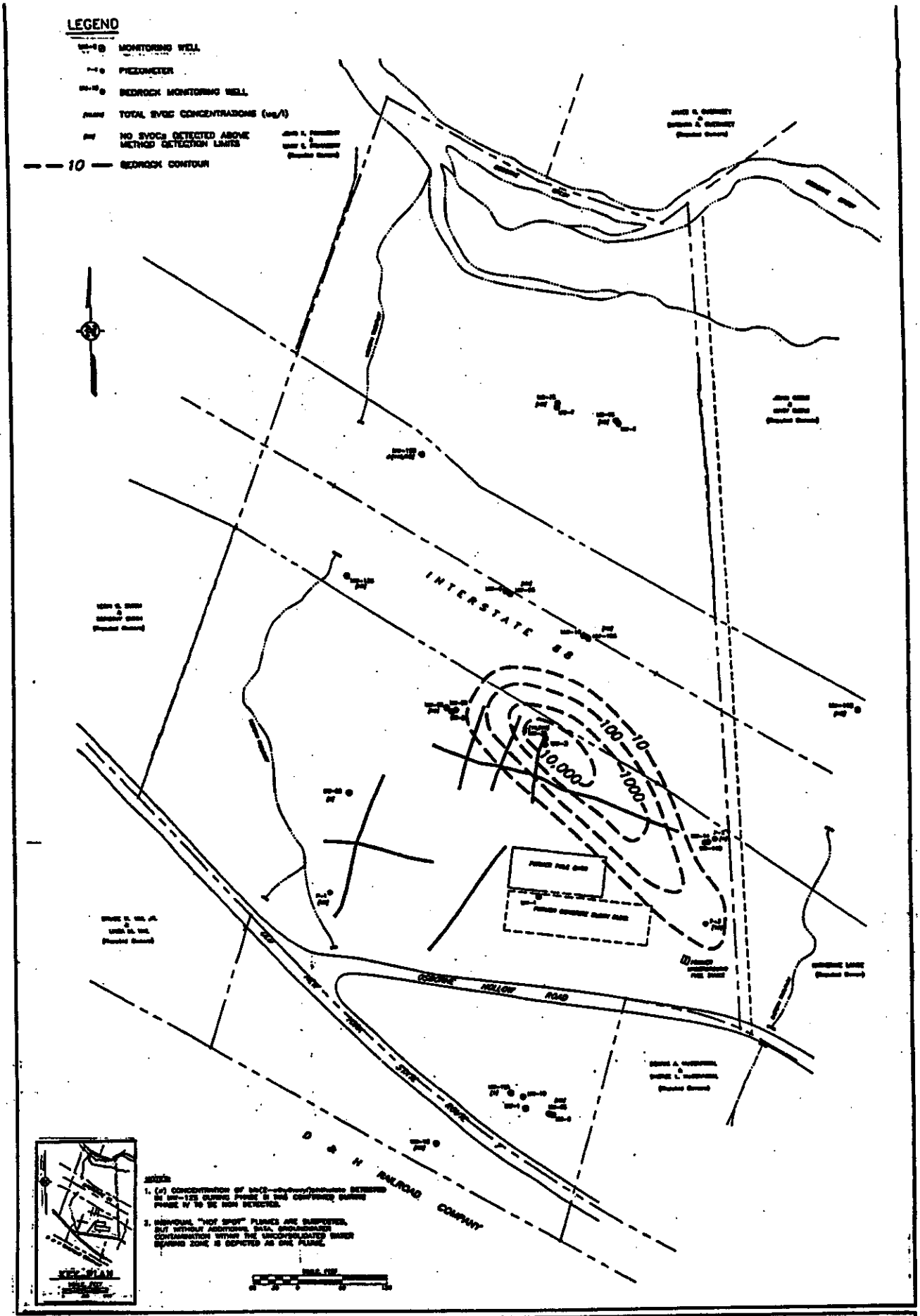


FIGURE 8-3	Date: 030307 Scale: AS SHOWN Designed: MHD Drawn: AMZ Checked: KBJ File: 141958-8100	TOTAL SVOC ISOPLETH MAP OF THE PHASE III REMEDIAL INVESTIGATION GROUNDWATER SAMPLING RESULTS FOR THE UPPER PORTION OF THE UNCONSOLIDATED WATER BEARING ZONE TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By

ESC

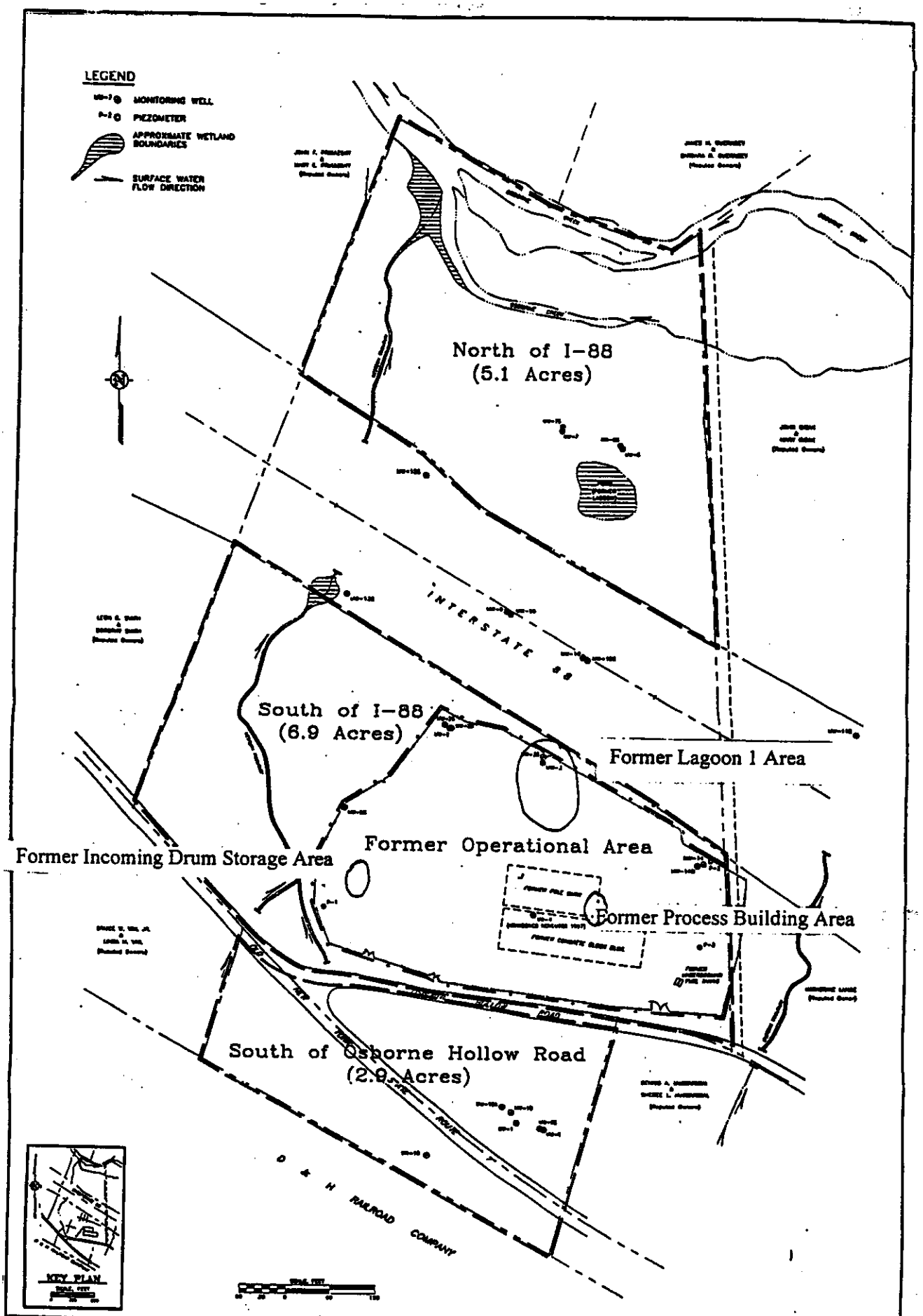


FIGURE 9-1	Date: 030497 Scale: AS SHOWN Design: KBJ Drawn: AR2 Checked: KBJ File: 141988-862	Principal Threat Areas within the Aprroximate Boundaries of Former Process Areas South of I-88 TRI-CITIES BARREL SUPERFUND SITE FENTON, NEW YORK	Revision Date / Description / By	ESC

APPENDIX II

TABLES

APPENDIX II

TABLES

Table 1-1 Summary of Surface Soil Sampling Data, North of I-88

Analyte	Number of Detections	Number Analyzed	Min. Conc. mg/kg	Max. Conc. mg/kg	Background Conc. mg/kg	PRG Conc. mg/kg
VOCs						
SVOCs						
bis(2ethylhexyl)phthalate	19	35	ND	31		2
Pesticides						
heptachlor	7	37	ND	0.099		0.010
dieldrin	7	37	ND	0.47		0.0033
alpha-chlordane	8	37	ND	0.66		0.06
gamma-chlordane	16	37	ND	0.12		0.06
PCBs						
Total PCBs	24	37	ND	33.0		1.0
Metals						
Arsenic	21	21	6.1	13.6	9.22	18.45
Barium	21	21	44	164	91.66	300
Beryllium	21	21	0.34	2.4	0.627	518
Cadmium	7	21	ND	3	0.88	1.76
Lead	17	17	12.5	86.6	27.27	400
Manganese	21	21	319	2,230	940.67	2,039
Mercury	12	21	ND	2.1	0.047	10
Nickel	12	21	10	30.9	23.39	2212
Silver	5	21	ND	1.9	0.461	0.92
Sodium	21	21	43.8	751	101.56	203.02
Thallium	8	21	ND	1.4	0.551	1.1
Zinc	21	21	55.5	686	71.97	143.95

Table 1-2 Summary of Subsurface Soil Sampling Data, North of I-88

Metals						
Cadmium	1	5	ND	2.2	0.88	1.76
Mercury	1	45	ND	0.59	0.047	10

Table 2-1 Summary of Surface Soil Sampling Data, South of I-88

Analyte	Number of Detections	Number Analyzed	Min. Conc. mg/kg	Max. Conc. mg/kg	NYS TAGM mg/kg	PRG Conc. mg/kg
VOCs						
toluene	11	54	ND	210	1.5	5148
ethylbenzene	14	54	ND	120	5.5	5.5
xylene (total)	15	54	ND	640	1.2	1.2
4-methyl-2-pentanone	3	54	ND	13	1	1
tetrachloroethene	16	54	ND	120	1.4	1
acetone	18	54	ND	11	0.2	0.2
1,1,1-trichloroethane	5	54	ND	35	0.8	0.8
vinyl chloride	3	54	ND	14	0.012	0.01
1,1-dichloroethane	5	54	ND	26	0.2	1643
1,2-dichloroethene	7	54	ND	1,100	0.3	156
2-butanone	4	54	ND	0.8	0.3	1798
trichloroethene	9	54	ND	4.9	0.7	5
SVOCs						
indeno(1,2,3-cd)pyrene	12	54	ND	28		0.33
phenol	8	54	ND	120		30
2-methylphenol	1	54	ND	13		0.1
4-methylphenol	3	54	ND	42		0.9
naphthalene	1	54	ND	49		13
dibenzofuran	4	54	ND	41		6.2
diethyl phthalate	8	54	ND	80		7.1
fluorene	6	54	ND	77		50
phenanthrene	19	54	ND	190		50
di-n-butyl phthalate	14	54	ND	8.8		8.1
fluoranthene	22	54	ND	120		50
pyrene	21	54	ND	120		50
benzo(a)anthracene	14	54	ND	64		0.33
chrysene	13	54	ND	67		0.4
bis(2-ethylhexyl)phthalate	36	54	ND	13,000		50
benzo(b)fluoranthene	22	54	ND	30		0.33
benzo(k)fluoranthene	11	54	ND	19		0.33
benzo(a)pyrene	12	54	ND	65		0.33
dibenzo(a,h)anthracene	2	54	ND	17		0.33

Table 2-1 Summary of Surface Soil Sampling Data, South of I-88 (continued)

Analyte	Number of Detections	Number Analyzed	Min. Conc. mg/kg	Max. Conc. mg/kg	Background Conc. mg/kg	PRG Conc. mg/kg
Pesticides						
heptachlor	9	54	ND	36		0.01
Aldrin	4	54	ND	0.64		0.002
dieldrin	17	53	ND	65		0.0033
endrin	8	53	ND	0.75		0.1
alpha-chlordane	48	54	ND	300		0.06
gamma-chlordane	52	54	ND	400		0.06
4,4'-DDD	19	53	ND	8.5		0.08
4,4'-DDE	9	53	ND	0.68		0.07
4,4'-DDT	15	54	ND	4.3		0.07
PCBs						
Total PCBs	14	55	ND	169.9		1.0
Metals						
Antimony	15	54	ND	137	4.08	52
Barium	54	54	45.6	1,210	91.66	300
Cadmium	37	54	ND	10.2	0.88	1.76
Chromium	54	54	12.8	1,610	16.48	736
Cobalt	54	54	10.0	37.2	12.3	24.7
Copper	53	53	13.8	515	19.2	38.3
Lead	54	54	12.9	8,540	27.27	400
Mercury	48	54	ND	7.9	0.047	10
Selenium	17	54	ND	1.7	0.26	0.52
Silver	27	54	ND	51.7	0.461	0.92
Sodium	48	48	33	853	101.56	203
Thallium	20	54	ND	4.3	0.55	1.1
Zinc	54	54	61.5	510	71.97	143.95

Table 2-2 Summary of Subsurface Soil Sampling Data, South of I-88

Analyte	Number of Detections	Number Analyzed	Min. Conc. mg/kg	Max. Conc. mg/kg	NYS TAGM mg/kg	PRG Conc. mg/kg
VOCs						
toluene	32	49	ND	990	1.5	5148
ethylbenzene	23	49	ND	370	5.5	5.5
xylene (total)	24	49	ND	460	1.2	1.2
4-methyl-2-pentanone	8	49	ND	32	1	1
tetrachloroethene	16	49	ND	260	1.4	1
1,1,1-trichloroethane	7	49	ND	4.8	0.8	0.8
methylene chloride	3	49	ND	1,400	0.1	100
1,1-dichloroethane	15	49	ND	280	0.2	1643
1,2-dichloroethene	1	49	ND	0.53	0.3	156
acetone	12	49	ND	0.99	0.2	0.2
2-butanone	9	49	ND	60	0.3	1798
trichloroethene	13	49	ND	7,000	0.7	5
SVOCs						
1,2-dichlorobenzene	3	49	ND	150		7.9
2-mehtylphenol	3	49	ND	1.5		0.43
4-methylphenol	2	49	ND	4		0.9
1,2,4-trichlorobenzene	1	49	ND	240		3.4
2,4,5-trichlorophenol	2	49	ND	0.39		0.1
diethyl phthalate	6	49	ND	28		7.1
pentachlorophenol	4	49	ND	9.5		1.0
benzo(a)anthracene	3	49	ND	1.4		0.33
chrysene	3	49	ND	1.6		0.4
benzo(b)fluoranthene	5	49	ND	1.9		0.33
bis(2-ethylhexyl)phthalate	28	49	ND	3,000		
Pesticides						
heptachlor	3	49	ND	1.5		0.01
endosulfan I	5	49	ND	170		0.9
dieldrin	15	48	ND	80		0.0033
endrin	4	48	ND	0.48		0.1
alpha-chlordane	35	49	ND	27		0.06
gamma-chlordane	36	49	ND	30		0.06
4,4'-DDD	14	46	ND	200		0.08
4,4'-DDE	12	49	ND	480		0.07
4,4'-DDT	2	49	ND	1.9		0.07

Table 2-2 Summary of Subsurface Soil Sampling Data, South of I-88 (continued)

Analyte	Number of Detections	Number Analyzed	Min. Conc. mg/kg	Max. Conc. mg/kg	Background Conc. mg/kg	PRG Conc. mg/kg
PCBs						
Total PCBs	32	49	ND	3,600		10.0
Metals						
Antimony	6	45	ND	41.6	4.08	52
Barium	49	49	55.0	1,810	91.66	300
Beryllium	42	49	ND	640	0.627	518
Cadmium	12	49	ND	47.4	0.88	1.76
Chromium	49	49	12.1	576	16.48	736
Cobalt	49	49	7.9	100	12.3	24.7
Copper	42	42	16.2	409	19.2	38.3
Lead	49	49	8.9	3,510	27.27	400
Mercury	22	49	ND	40.2	0.047	10
Selenium	5	49	ND	31.8	0.258	0.516
Silver	16	49	ND	32.4	0.461	0.92
Sodium	39	39	50.9	1,230	101.56	203.03
Thallium	16	49	ND	1.71	0.551	1.1
Vanadium	49	49	7.9	64.4	17.9	35.9
Zinc	48	48	47.4	3,800	71.97	143.95

Table 3-1 Summary of Surface Soil Sampling Data, South of Osborne Hollow Road

Analyte	Number of Detections	Number Analyzed	Min. Conc. mg/kg	Max. Conc. mg/kg	Background Conc. mg/kg	PRG Conc. mg/kg
VOCs						
SVOCs						
bis(2ethylhexyl)phthalate	6	6	0.057	7.0		2/50
benzo(b)fluoranthene	5	6	ND	0.340		0.33
Pesticides						
dieldrin	1	6	ND	0.0056		0.0033
endrin	1	6	ND	0.12		0.10
PCBs						
Metals						
Antimony	1	5	ND	11.7	4.08	52
Arsenic	6	6	8.1	13.1	9.22	18.45
Barium	6	6	81	188	91.66	300
Beryllium	6	6	0.55	1.0	0.627	518
Cadmium	5	6	ND	3.4	0.88	1.76
Chromium	6	6	14.3	21.3	16.48	736
Copper	6	6	18.3	34.0	19.2	38.3
Lead	6	6	17.7	141	27.27	400
Manganese	6	6	517	1,640	940.67	2039
Mercury	6	6	0.05	1.4	0.047	10
Selenium	5	6	ND	1.2	0.258	0.516
Silver	5	6	ND	2.3	0.461	0.92
Vanadium	6	6	19.0	23.0	17.9	35.9
Zinc	6	6	70.5	407	71.97	143.95

Table 3-2 Summary of Subsurface Soil Sampling Data, South of Osborne Hollow Road

Analyte	Number of Detections	Number Analyzed	Min. Conc. mg/kg	Max. Conc. mg/kg	Background Conc. mg/kg	PRG Conc. mg/kg
SVOCs						
bis(2ethylhexyl)phthalate	1	4	ND	2.6		2
Metals						
Arsenic	1	4	8.1	13.9	9.22	18.45
Beryllium	4	4	0.50	0.95	0.627	518
Cadmium	3	4	ND	2.6	0.88	1.76
Chromium	4	4	14.5	18.9	16.48	736
Cobalt	4	4	11.8	15.3	12.3	24.7
Copper	4	4	14.4	21.7	19.2	38.3
Lead	4	4	12.4	30.1	27.27	400
Manganese	4	4	454	1,420	940.67	2039
Mercury	3	4	ND	1.2	0.047	10
Nickel	4	4	25.5	28.8	0.047	10
Selenium	3	4	ND	0.79	0.258	0.516
Silver	3	4	ND	2.0	0.461	0.92
Vanadium	4	4	17.1	22.6	17.9	35.9

Table 4-1 Summary of Sediment Data

Analyte	Number of Detections above ARAR	Number Analyzed	Min. Conc. ug/g OC	Max. Conc. ug/g OC	ARAR Conc. ug/g OC
VOCs					
SVOCs					
Phenanthrene	4	15	94	600000	120
Fluoranthene	2	15	66	540000	1020
Benzo(a)anthracene	9	15	75	210000	1.3
Chrysene	7	15	130	190000	1.3
Bis(2-Ethylhexyl)phthalate	5	18	38	4600	199.5
Benzo(b)fluoranthene	9	15	65	190000	1.3
Benzo(k)fluoranthene	5	15	40	56000	1.3
Benzo(a)pyrene	7	15	55	110000	1.3
Indeno(1,2,3-cd)pyrene	6	15	44	89000	1.3
Acenaphthene	1	9	ND	68000	140
PESTICIDES					
Endrin aldehyde	4	15	4.3	5.9	0.8
4,4-DDE	3	13	26	890	1
Heptaclor	4	14	2.4	190	0.03
Alpha-Chlordane	12	15	1.3	4600	0.006
Gamma-Chlordane	13	19	0.15	6000	0.006
Dieldrin	1	15	0.38	240	9
Endosulfan-II	0	8	ND	ND	0.03
Toxaphene	1	9	ND	2300	0.01
4,4-DDD	3	8	ND	580	1
4,4-DDT	1	9	ND	11	1
PCBs					
Aroclor 1248	9	16	9	84000	1.4
Aroclor 1254	3	10	ND	17000	1.4
Aroclor 1260	3	15	4.9	55	1.4
METALS					
Iron	1	16	10300000	42500000	40000000
Lead	1	16	6900	132000	110000
Manganese	3	16	286000	1360000	1100000
Mercury	1	13	ND	1900	1300
Zinc	1	16	29300	275000	270000

Table 5-1 Summary of Groundwater Data

Analyte	Number of Detections above ARAR	Number Analyzed	Min. Conc. ug/l	Max. Conc. ug/l	ARAR Conc. ug/l
VOCs					
Vinyl Chloride	11	68	1	2100	2
Chloroethane	6	68	0.6	34	5
1,1-Dichloroethane	10	68	1	17	5
Cis-1,2-Dichloroethene	11	67	1	1200	5
Trichloroethene	6	64	1	29	5
1,1,1-Trichloroethane	4	64	1	310	5
1,2-Dichloropropane	2	60	1	3	1
Xylenes (Total)	1	51	0.7	2.1	2
1,2-Dichloroethane	2	23	1	4700	0.6
2-Butanone	2	35	5	5300	50
Benzene	1	23	ND	1	0.7
Tetrachloroethene	2	43	1	14	5
Toluene	2	35	0.6	7500	5
Ethylbenzene	1	23	ND	400	5
SVOCs					
Phenol	3	40	ND	6900	1
1,2-Dichlorobenzene	2	17	1	24	3
2-Methylphenol	2	39	ND	690	5
4-Methylphenol	2	39	8	13000	5
Naphthalene	1	17	ND	11	10
2,4,5-Trichlorophenol	1	27	1	18	1
Bis(2-Ethylhexyl)phthalate	3	62	1	440	5
TOTAL METALS					
Antimony	3	31	2.2	59.2	3
Arsenic	2	52	3.2	84.6	25
Cadmium	2	42	0.48	6.2	5
Chromium	1	59	4.6	52.8	50
Iron	42	59	35.1	156000	300
Lead	3	55	1.2	58.7	15
Manganese	46	59	1.9	40000	300
Mercury	1	57	0.12	2.3	0.7
Nickel	6	59	14.5	1060	100
Sodium	44	59	7800	692000	20000
Thallium	15	55	1.1	5	2

- Note: Most stringent of Federal Maximum Cleanup Level and New York State Drinking Water Standard was used.

Table 6-1 Chemicals of Potential Concern at Tri-Cities Barrel Site

VOCs

tetrachloroethene
toluene
methylene chloride
1,1-dichloroethane
1,2-dichloroethane
1,2-dichloroethene (total)
cis-1,2-dichloroethene
trans-1,2-dichloroethene
2-butanone
trichloroethene
vinyl chloride

SVOCs

acenaphthylene
benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
benzo(g,h,i)perylene
bis(2-ethylhexyl)phthalate
dibenzo(a,h)anthracene
2,4-dimethylphenol
indeno(1,2,3-cd)pyrene
2-methylnaphthalene
4-(p-cresol)methylphenol
phenanthrene

Metals

antimony
arsenic
beryllium
cadmium
chromium
iron
lead
manganese
mercury
nickel

Pesticides

aldrin
alpha-chlordane
4,4'-DDD
4,4'-DDE
delta-BHC
dieldrin
gamma-chlordane
heptachlor

PCBs

Aroclor-1242
Aroclor-1248
Aroclor-1254
Aroclor-1260

Dioxins

2,3,7,8-TCDD

Table 7-1 Summary of Exposure Pathways
Selected for Quantitative Analysis at Tri-Cities Barrel Site

Exposure Population	Exposure Point	Exposure Medium	Exposure Route
Current/Future	South of I-88	Surface Soil (0-2 feet)	Oral and Dermal
Site Visitor	[Processing Area]	Outdoor Air	Inhalation
		Surface Water	Oral and Dermal
		Sediment	Oral and Dermal
	North of I-88	Surface Soil (0-2 feet)	Oral and Dermal
	[North Area]	Surface Water	Oral and Dermal
		Sediment	Oral and Dermal
	South of Osborne Hollow Road [South Area]	Surface Soil (0-2 feet)	Dermal
Creek Visitor	Osborne Creek	Surface Water	Oral and Dermal
		Sediment	Oral and Dermal
Future	South of I-88	Soil (0-2 feet or 0-12 feet)	Oral and Dermal
Resident		Outdoor Air	Inhalation
Adult/Child		Vegetables	Oral
		Groundwater	Oral and Dermal
		Indoor Air	Inhalation
	South of Osborne	Surface Soil (0-2 feet)	Oral and Dermal
	Hollow Road	Vegetables	Oral
Future	South of I-88	Surface Soil (0-2 feet)	Oral and Dermal
Worker		Outdoor Air	Inhalation
		Groundwater	Oral
	North of I-88	Surface Soil (0-2 feet)	Oral
		Groundwater	Oral
	South of Osborne Hollow Road	Surface Soil (0-2 feet)	Oral

[ ] denotes area name used in the Risk Assessment

Table 8-1 Summary of Excess Cancer Risks for Hypothetical Future Residential Populations at Tri-Cities Barrel Site

Exposure Point	Exposure Medium	Exposure Route	Cancer Risk AVG	Cancer Risk RME
South of I-88	Surface Soil	Oral	3E-05	5E-04
	Surface Soil	Dermal	1E-06	2E-04
	Outdoor Air	Inhalation	6E-07	2E-06
(Surface Soil	Vegetables	Oral	3E-03	2E-02
Scenario)	Groundwater	Oral	9E-02	4E-01
	Groundwater	Dermal	2E-03	8E-03
	Bedrock Groundwater	Oral	3E-05	1E-04
	Bedrock Groundwater	Dermal	5E-06	2E-05
	Indoor Air	Inhalation	7E-02	2E-01
		Total:	2E-01	6E-01
South of I-88	All Soils	Oral	2E-05	4E-04
(All Soils	All Soils	Dermal	2E-06	2E-04
Scenario)	Outdoor Air	Inhalation	6E-07	2E-06
	Vegetables	Oral	2E-03	1E-02
	Groundwater	Oral	9E-02	4E-01
	Groundwater	Dermal	2E-03	8E-03
	Bedrock Groundwater	Oral	3E-05	1E-04
	Bedrock Groundwater	Dermal	5E-06	2E-05
	Indoor Air	Inhalation	7E-02	2E-01
		Total:	2E-01	6E-01
North of I-88	Surface Soil	Oral	2E-05	4E-04
	Surface Soil	Dermal	3E-06	4E-04
	Vegetables	Oral	3E-03	2E-02
	Groundwater	Oral	5E-02	2E-01
	Groundwater	Dermal	1E-03	4E-03
	Bedrock Groundwater	Oral	3E-05	1E-04
	Bedrock Groundwater	Dermal	5E-06	2E-05
	Indoor Air	Inhalation	4E-02	1E-01
		Total:	9E-01	3E-01
South of Osborne	Surface Soil	Oral	1E-06	3E-05
Hollow Road	Surface Soil	Dermal	4E-09	6E-07
	Vegetables	Oral	2E-05	1E-04
		Total:	2E-05	1E-04

Table 8-2 Summary of Excess Cancer Risks for Future Worker and Visitor Populations at Tri-Cities Barrel Site

Exposure Population	Exposure Point	Exposure Medium	Exposure Route	Cancer Risk AVG	Cancer Risk RME
Current/Future Worker	South of I-88	Surface Soil	Oral	1E-05	5E-05
		Outdoor Air	Inhalation	3E-07	1E-06
		Groundwater	Oral	3E-02	1E-01
		Bedrock Groundwater	Oral	9E-06	3E-05
			Total:	3E-02	1E-01
Future Worker	North of I-88	Surface Soil	Oral	9E-06	4E-05
		Groundwater	Oral	2E-02	7E-02
		Bedrock Groundwater	Oral	9E-06	3E-05
			Total:	2E-02	7E-02
	South of Osborne Hollow Road	Surface Soil	Oral	7E-07	4E-06
			Total:	7E-07	4E-06
Current/Future Site Visitor	South of I-88	Surface Soil	Oral	2E-06	8E-06
		Surface Soil	Dermal	7E-07	7E-06
		Outdoor Air	Inhalation	3E-08	1E-07
		Surface Water	Oral	1E-10	5E-10
		Surface Water	Dermal	2E-09	6E-09
		Sediment	Oral	4E-06	2E-05
		Sediment	Dermal	5E-08	5E-07
			Total:	7E-06	4E-05
	North of I-88	Surface Soil	Oral	1E-06	6E-06
		Surface Soil	Dermal	1E-06	1E-05
		Sediment	Oral	9E-07	3E-06
		Sediment	Dermal	2E-06	2E-05
			Total:	5E-06	4E-05
	South of Osborne Hollow Road	Surface Soil	Oral	1E-07	5E-07
		Surface Soil	Dermal	2E-09	2E-08
			Total:	1E-07	5E-07
Current/Future Creek Visitor	Osborne Creek	Sediment	Oral	6E-08	2E-07
			Total:	6E-08	2E-07

Table 9-1 Summary of Hazard Indices for Hypothetical Future Residential Populations at Tri-Cities Barrel Site

Exposure Population	Exposure Point	Exposure Medium	Exposure Route	Hazard Index AVG	Hazard Index RME
Child Resident	South of I-88	Surface Soil	Oral	10	20
		Surface Soil	Dermal	0.03	1
	(Surface Soils	Outdoor Air	Inhalation	0.0004	0.0005
	Scenario)	Vegetables	Oral	200	500
		Groundwater	Oral	200	300
		Groundwater	Dermal	4	6
		Bedrock Groundwater	Oral	2	3
		Bedrock Groundwater	Dermal	0.04	0.05
		Indoor Air	Inhalation	10	10
			Total:	400	800
	South of I-88	Soils	Oral	4	10
		Soils	Dermal	0.02	0.9
	(All Soils	Outdoor Air	Inhalation	0.0004	0.0005
	Scenario)	Vegetables	Oral	100	200
		Groundwater	Oral	200	300
		Groundwater	Dermal	4	6
		Bedrock Groundwater	Oral	2	3
		Bedrock Groundwater	Dermal	0.04	0.05
		Indoor Air	Inhalation	10	10
			Total:	300	500
	North of I-88	Surface Soil	Oral	5	9
		Surface Soil	Dermal	0.1	5
		Vegetables	Oral	100	200
		Groundwater	Oral	70	100
		Groundwater	Dermal	3	2
		Bedrock Groundwater	Oral	2	3
		Bedrock Groundwater	Dermal	0.04	0.05
		Indoor Air	Inhalation	3	3
			Total	300	500
	South of Osborne	Surface Soil	Oral	0.9	2
	Hollow Road	Surface Soil	Dermal	0.0001	0.006
		Vegetables	Oral	0.9	1
			Total	2	3

(a) Hazard Index is subchronic for child population and chronic for adult population.

Table 9-1 Summary of Hazard Indices for Hypothetical Future (continued)
Residential Populations at Tri-Cities Barrel Site

Exposure Population	Exposure Point	Exposure Medium	Exposure Route	Hazard Index AVG	Hazard Index RME
Adult Resident	South of I-88	Surface Soils	Oral	1	8
		Surface Soils	Dermal	0.05	2
		Outdoor Air	Inhalation	0.0003	0.0002
		Vegetables	Oral	200	200
		Groundwater	Oral	100	100
		Groundwater	Dermal	5	6
		Bedrock Groundwater	Oral	0.7	1
		Bedrock Groundwater	Dermal	0.07	0.03
		Indoor Air	Inhalation	9	10
			Total:	300	300
	South of I-88	Soils	Oral	0.7	3
		Soils	Dermal	0.03	1
		Outdoor Air	Inhalation	0.0003	0.0002
		Vegetables	Oral	70	100
		Groundwater	Oral	100	100
		Groundwater	Dermal	5	6
		Bedrock Groundwater	Oral	0.7	1
		Bedrock Groundwater	Dermal	0.02	0.03
		Indoor Air	Inhalation	9	10
			Total:	200	200
	North of I-88	Surface Soils	Oral	1	6
		Surface Soils	Dermal	0.2	7
		Vegetables	Oral	100	200
		Groundwater	Oral	50	70
		Groundwater	Dermal	2	2
		Bedrock Groundwater	Oral	0.7	1
		Bedrock Groundwater	Dermal	0.02	0.03
		Indoor Air	Inhalation	3	3
			Total:	300	300
	South of Osborne Hollow Road	Surface Soils	Oral	0.7	3
		Surface Soils	Dermal	0.03	1
		Vegetables	Oral	70	100
			Total:	200	200
			Total	2	3

(a) Hazard Index is subchronic for child population and chronic for adult population.

Table 9-2 Summary of Hazard Indices for Future Worker and Visitor Populations at Tri-Cities Barrel Site

Exposure Population	Exposure Point	Exposure Medium	Exposure Route	Hazard Index AVG	Hazard Index RME
Current/Future Worker	South of I-88	Surface Soil	Oral	0.5	1
		Outdoor Air	Inhalation	0.0001	0.0001
		Groundwater	Oral	40	40
		Bedrock Groundwater	Oral	0.3	0.3
			Total:	40	40
Future Worker	North of I-88	Surface Soil	Oral	0.4	0.9
		Groundwater	Oral	20	30
		Bedrock Groundwater	Oral	0.3	0.3
			Total:	20	30
	South of Osborne Hollow Road	Surface Soil	Oral	0.03	0.07
			Total:	0.03	0.07
Current/Future Site Visitor	South of I-88	Surface Soil	Oral	0.08	0.3
		Surface Soil	Dermal	0.02	0.2
		Outdoor Air	Inhalation	0.00001	0.00005
		Surface Water	Oral	0.00002	0.0001
		Surface Water	Dermal	0.0002	0.0006
		Sediment	Oral	0.003	0.01
		Sediment	Dermal	0.001	0.01
			Total:	0.1	0.5
	North of I-88	Surface Soil	Oral	0.06	0.3
		Surface Soil	Dermal	0.06	0.6
		Surface Water	Oral	0.00004	0.0001
		Surface Water	Dermal	0.0002	0.0006
		Sediment	Oral	0.03	0.1
		Sediment	Dermal	0.07	0.7
			Total:	0.2	2
	South of Osborne Hollow Road	Surface Soil	Oral	0.005	0.02
		Surface Soil	Dermal	0.001	0.01
			Total:	0.006	0.03
Current/Future Creek Visitor	Osborne Creek	Surface Water	Oral	0.00001	0.00004
		Surface Water	Dermal	0.00002	0.00009
		Sediment	Oral	0.002	0.007
		Sediment	Dermal	---b--	---b--
			Total:	0.002	0.007

(a) Hazard Index is subchronic for child population and chronic for adult population.
(b) Noncarcinogenic chemicals not detected at this exposure point in this medium.

Table 10-1 Cost Estimate for Selected Soil Remedy, Alternative SS-3

Item	Unit	Quantity	Unit Price	Extension
Work Plans	LS	1	$40,000.00	$40,000
Pre-design Investigations + Ecological Study	LS	1	$100,000.00	$100,000
Engineering	LS	1	$125,000.00	$125,000
Mobilization/Demobilization	LS	1	$25,000.00	$25,000
Site Preparation (inc. access to tributaries)	LS	1	$100,000.00	$100,000
Clearing	Acre	10	$4,000.00	$40,000
Silt Fence Installation	LF	2,000	$5.00	$10,000
Straw Bale Installation	LF	2,000	$5.00	$10,000
Hazardous Soil Transportation & Disposal	CY	22,500	$540.00	$12,150,000
Excavate & Load Trucks	CY	49,000	$10.00	$490,000
PCB Soil Transportation & Disposal	CY	900	$800.00	$720,000
Nonhazardous Soil Transportation & Disposal	CY	25,000	$60.00	$1,500,000
Backfill for Excavated Areas (c)	CY	49,900	$20.00	$998,000
Re-establish Wetland, North of I-88	LS	1	$25,000.00	$25,000
Excavate & Dispose Sediments from Tributaries	CY	1,900	$125.00	$237,500
Backfill Tributaries w/ Riprap & Sediment	CY	1,900	$40.00	$76,000
Top Soil	CY	3,900	$25.00	$97,500
Seed and Mulch	Acre	12	$3,000.00	$36,000
Surveying	LS	1	$40,000.00	$40,000
Confirmatory Analysis	EA	300	$1,000.00	$300,000
Geotechnical Testing	LS	1	$40,000.00	$40,000
Construction Oversight	Month	6	$45,000.00	$270,000
CAPITAL COST			TOTAL	$17,430,000
Total Annual O&M Cost [1]				$0
Alternative SS-3 TOTAL NET PRESENT WORTH				$17,430,000

[1] No operation and maintenance costs associated with soil and sediment anticipated for this alternative.
From FS Report Table 4-1 prepared by ESC.

Table 10-2 Cost Estimate for Selected Groundwater Remedy, Alternative GW-3

Item	Unit	Quantity	Unit Price	Extension
Pre-design Investigations	LS	1	$50,000.00	$50,000
Engineering	LS	1	$180,000.00	$180,000
Treatment System and Building	LS	1	$825,000.00	$825,000
Extraction Well Network	EA	10	$7,500.00	$75,000
Permitting	LS	1	$30,000.00	$30,000
Construction Oversight	LS	1	$87,000.00	$87,000
CAPITAL COST			TOTAL	$1,247,000
Total Annual O&M Monitoring Cost [1]				$137,000
Alternative GW-3 TOTAL NET PRESENT WORTH				$2,947,000

[1] Includes quarterly sampling and select analysis of 4 resident wells and 4 select onsite wells.

From FS Report Table 4-7 prepared by ESC.

APPENDIX III

ADMINISTRATIVE RECORD INDEX

TRI-CITIES BARREL SITE
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.1 Sampling and Analysis Plans

P. 300001 - 300381 Report: Remedial Investigation/Feasibility Study for the Tri-Cities Barrel Site, Fenton, New York, Sampling and Analysis Plan, prepared by Environmental Strategies Corporation, May 21, 1993.

3.3 Work Plans

P. 300382 - 300567 Report: Remedial Investigation/Feasibility Study for the Tri-Cities Barrel Site, Fenton, New York, Health and Safety Plan, (Revision No. 3), prepared by Environmental Strategies Corporation, May 21, 1993.

P. 300568 - 300773 Report: Remedial Investigation/Feasibility Study for the Tri-Cities Barrel Site in Fenton, New York, Final Work Plan (Revision No. 6), prepared by Environmental Strategies Corporation, December 24, 1992.

10.0 PUBLIC PARTICIPATION

10.2 Community Relations Plans

P. 1000001 - 1000010 Report: Community Relations Plan, Tri-Cities Barrel Site, Fenton, Broome County, New York, prepared by Roy F. Weston, Inc., undated.

TRI-CITIES BARREL SITE
ADMINISTRATIVE RECORD FILE UPDATE
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3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P. 300774 - 301101 Report: Interim Site Summary Report for the Phase I Remedial Investigation, Tri-Cities Barrel Superfund Site, Fenton, New York, prepared by Environmental Strategies Corporation, May 12, 1994. Attached Report: Phase I Interim Site Summary Report, (undated).

P. 301102 - 301147 Report: Work Plan Addendum for the Phase II Remedial Investigation Tri-Cities Superfund Site, Fenton, New York, prepared by Environmental Strategies Corporation, July 22, 1994.

TRI-CITIES BARREL SITE
ADMINISTRATIVIE RECORD FILE UPDATE II
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P.301148 - 301471 Report: Data Validation Summary Report Phase II Remedial Investigation, Tri-Cities Barrel Superfund Site, Fenton, New York, prepared by Environmental Strategies Corporation, December 9, 1994.

TRI-CITIES BARREL SITE
ADMINISTRATIVE RECORD FILE UPDATE III
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3.0 Remedial Investigation

3.4 Remedial Investigation Reports

P. 301472-301802 Report: Final Baseline Risk Assessment - Human Health Evaluation, prepared for Roy F. Weston, Inc., prepared by Life Systems, Inc., December 13, 1996.

P. 301803-301993 Report: Baseline Risk Assessment - Ecological Risk Assessment, prepared for Roy F. Weston, Inc., prepared by Life Systems, Inc., January 6, 1997.

TRI-CITIES BARREL SITE
ADMINISTRATIVE RECORD FILE UPDATE IV
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3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P. 301994 - 302095 Report: Revised Addendum to the Baseline Risk Assessment - Human Health Evaluation, RI/FS Compliance Oversight for the Tri-Cities Barrel Superfund Site, Fenton, New York, prepared by Life Systems, Inc., prepared for Roy F. Weston, Inc., June 1, 1998.

P. 302096 - 302294 Report: Final Remedial Investigation Report Revision No.3, Tri-Cities Barrel Superfund Site, Fenton, New York, Volume 1, Text, prepared by Environmental Strategies Corporation, prepared for U.S. EPA, Region II, March 25, 1999.

P. 302295 - 302536 Report: Final Remedial Investigation Report Revision No. 3, Tri-Cities Barrel Superfund Site, Fenton, New York, Volume II, Figures and Tables, prepared by Environmental Strategies Corporation, prepared for U.S. EPA, Region II, March 25, 1999.

P. 302537 - 303418 Report: Final Remedial Investigation Report Revision No. 3, Tri-Cities Barrel Superfund Site, Fenton, New York, Volume III, Appendices A - K, prepared by Environmental Strategies Corporation, prepared for U.S. EPA, Region, II, March 25, 1999.

P. 303419 - 304054 Report: Final Remedial Investigation Report Revision No. 3, Tri-Cities Barrel Superfund Site, Fenton, New York, Volume IV, Appendices L - T, prepared by Environmental Strategies Corporation, prepared for U.S. EPA, Region II, March 25, 1999.

3.5 Correspondence

P. 304055 - 304055 Letter to Mr. Jack Spicuzza, Project Coordinator, Ashland Chemical, from Ms. Young S. Chang, Project Manager, U.S. EPA, Region II, re: Conditional Approval of the Final Remedial Investigation Report Revision No. 3, Tri-Cities Barrel Superfund Site, April 22, 1999.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400011 Report: Tri-Cities Barrel Superfund Site Feasibility Study Report Addendum, prepared by U.S. EPA, Region II, December 9, 1999. (Attachment: Appendix A - (a)Letter to Mr. Joel Singerman, Chief, Central NY Remediation Section, U.S. EPA, Region II, from Mr. Donald F. Brown, P.E., Town Engineer, Offices of the Town of Fenton, re: Tri-Cities Barrel Site, Town of Fenton, August 23, 1999; and (b)Letter to Mr. Jack Spicuzza, Environmental Engineer, Ashland, Inc., from Mr. Donald F. Brown, P.E., Town Engineer, Offices of the Town of Fenton, re: Tri-Cities Barrel Superfund Site, Fenton, New York, November 2, 1999.)

P. 400012 - 400328 Report: Draft Feasibility Study Report, Revision 3, Tri-Cities Barrel Superfund Site, Fenton, New York, prepared by Environmental Strategies Corporation, prepared for U.S. EPA, Region II, August 25, 1999.

11.0 TECHNICAL SOURCES AND GUIDANCE DOCUMENTS

11.1 EPA Headquarters

P. 11.00001 - 11.00004 Fact Sheet: A Guide to Principal Threat and Low Level Threat Wastes, prepared by U.S. EPA, Office of Solid Waste and Emergency Response, November, 1991.

APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, Room 260B
50 Wolf Road, Albany, New York 12233-7010
Phone: (518) 457-5861 • FAX: (518) 485-8404
Website: www.dec.state.ny.us

John P. Cahill
Commissioner

MAR 30 2000

Mr. Richard Caspe
Director
Emergency and Remedial Response Division
United States Environmental Protection Agency
Region II
E38, Floor 19
290 Broadway
New York, NY 10007-1866

Post-it® Fax Note 7671	Date 3/30	# of pages ▶
To Joel Singerman	From Mike O'Toole	
Co./Dept. EPA	Co. DEC	
Phone #	Phone # (518) 457-5861	
Fax # (212) 637-3966	Fax #	

Dear Mr. Caspe:

Re: Tri-City Barrel Site, Site No. 7-04-005

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) concur with the remedy in the Record of Decision (ROD): excavation and off-site treatment/disposal of contaminated soils and sediments, and groundwater extraction and treatment.

The ROD calls for the use of the health-based Preliminary Remediation Goals (PRGs), developed specifically for this site by the Feasibility Study, for those soils contaminated with semi-volatile organic compounds, pesticides and inorganic compounds (metals), to define the limits of the excavation. For those soils with PCBs and/or volatile organic compounds exceeding NYSDEC Technical Guidance Administrative Memoranda (TAGM) 4046 objectives, the respective TAGM objectives would be used to define the limits of the excavation. Under this alternative, those sediments exceeding NYSDEC's sediment cleanup objectives (as specified in its Division of Fish and Wildlife, Division of Marine Resources, Technical Guidance for Screening Contaminated Sediments, November 1993) would also be excavated/dredged. This concurrence is based upon the above site-specific method for delineation of the extent of the contamination to be addressed by the ROD, and incorporates the concerns expressed by the January 21, 2000 proposed plan concurrence letter.

If you have any questions, please contact Mr. Robert W. Schick at (518) 457-4343.

Sincerely,

Michael J. O'Toole, Jr.
Director

cc: A. Carlson/J. Sheehan, NYSDOH
R. Brink, BCHD

APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
Tri-Cities Barrel Superfund Site

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Tri-Cities Barrel site (Site) remedial investigation and feasibility study (RI/FS) and Proposed Plan and the responses of the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) to those comments and concerns. All comments summarized in this document have been considered in EPA and NYSDEC's final decision in the selection of a remedial alternative to address the contamination at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The January 2000 Proposed Plan, which identified EPA and NYSDEC's preferred remedy and the basis for that preference, and RI/FS reports were made available to the public in both the Administrative Record and information repositories maintained at the EPA Docket Room in the Region II New York City office and the information repository at the Fenton Town Hall, 44 Park Street, Port Crane, New York. The notice of availability for these documents was published in the *Press and Sun Bulletin* on January 22, 2000. A public comment period was held from January 21, 2000 to February 19, 2000. On February 9, 2000, EPA conducted a public meeting at the Chenango Valley High School to present the findings of the RI/FS and answer questions from the public about the Site and the remedial alternatives under consideration. Approximately 25 people, consisting of local businessmen, residents, representatives of the media, the potentially responsible party (PRP) Group and its contractor, and state and local government officials, attended the public meeting.

OVERVIEW

The preferred remedy includes, among other things, excavation/dredging of contaminated soils and sediments, followed by off-site treatment/disposal, and extraction and on-site treatment by air stripping, liquid phase carbon adsorption, and chemical precipitation technologies (or other appropriate treatment technologies) to address the contaminated groundwater, followed by discharge to surface water. Comments received during the public comment period indicate that the

public generally supports the selected remedy. The PRP Group supports the groundwater component of the selected remedy. The PRP Group does not, however, support the selected soil/sediment excavation and off-site treatment/disposal remedy; it expressed a preference for a variation of the Proposed Plan's capping alternative, Alternative SS-2. Capping would, however, leave in place levels of contamination, albeit capped, that would not be consistent with the community's planned use of the property. In response to EPA and the PRPs' inquiries regarding the Site's reasonably-anticipated future land use, the Town of Fenton Town Board indicated in an August 23, 1999 resolution and a November 2, 1999 letter from Donald F. Brown, Town Engineer, Town of Fenton, to Jack Spicuzza, the PRP Group's technical representative, that the current residential/agricultural zoning would not change. Based upon the public's input at the public meeting and in its written comments, it does not appear that the community is inclined to modify the current zoning.

The PRP Group submitted a letter of March 8, 2000 raising issues about EPA submitting its proposed remedy and the PRP Group's preferred remedy for the Site for review by the National Remedy Review Board (NRRB). EPA responded via a March 23, 2000 letter that indicated that the PRP Group's preferred remedy fails to pass the threshold National Contingency Plan criterion of being protective of human health and the environment for the reasonably-anticipated future land use. Thus, it is not a viable alternative for consideration by the NRRB. (See Appendix V-b).

The Responsiveness Summary is set up as follows:

Responses to the comments received at the public meeting and in writing during the public comment period are summarized below. Attached to this Responsiveness Summary are the following Appendices:

Appendix V-a - Letters Submitted During the Public Comment Period
Appendix V-b - PRP Group's Letter of March 8, 2000 related to a Remedy Review by the National Remedy Review Board and EPA's March 23, 2000 Response
Appendix V-c - List of the Potentially Responsible Parties for the Site

SUMMARY OF COMMENTS AND RESPONSES

A summary of the comments contained in the above letters and the comments provided at the February 9, 2000 public meeting, as well as

EPA and NYSDEC's responses to them, have been organized into the following topics:

- Extent of Contamination
- Public Health and Safety
- During Excavation/Site Cleanup
- Groundwater Remediation
- Property Concerns
- Ecological Risks
- Capping Alternative
- Cost Estimates
- Evaluation Process
- Community Relations
- Risk Assessment
- Enforcement Concerns
- Miscellaneous

A summary of the comments and concerns and EPA responses thereto are provided below:

Extent of Contamination

Comment #1: A commenter asked whether there is contamination under Interstate-88 (I-88), which was constructed through a portion of the Site.

Response #1: During the construction of I-88, the native soils were graded to prepare the ground surface for construction. Certain areas were cut into the native soils to allow smooth changes in roadway elevations. Since I-88 passes through areas over which liquid wastes from the reconditioning process were discharged (see Figure 3-1 in the Appendix I), it is very likely that contaminated soils were excavated as a result of the highway construction activities. According to Tri-Cities Barrel Co., Inc. (Tri-Cities Barrel) officer Gary Warner, excavated soils were deposited on the southern portion of the Site property at the request of Tri-Cities Barrel (those relocated soils that are contaminated will be addressed by the selected remedy). While it is unknown whether contaminated soils are present under the highway, groundwater samples collected from wells located in the highway's median strip did not exceed state or federal standards, and soil samples collected from the median strip and shoulders of I-88 did not have any contamination other than sodium in two surface soil samples and mercury in one subsurface soil sample. While the sodium is probably attributable to road salt residues and the mercury may be site-related, both contaminants were detected at below cleanup levels.

Public Health & Safety

Comment #2: A commenter expressed concern about utilizing the Chenango River for recreational activities, such as fishing and swimming, since Osborne Creek, which is located to the north of the Site, discharges into the Chenango River.

Response #2: One volatile organic compound, carbon disulfide, was detected in two surface water samples collected from Osborne Creek. The maximum concentration was 13 micrograms per liter (µg/l), for which a surface water quality standard has not been established. Since no carbon disulfide was detected within the Site's soil, sediment, or groundwater, this compound is not likely Site-related. No constituents of concern are present in Osborne Creek sediments.

Notwithstanding the presence of low levels of carbon disulfide in Osborne Creek, since the Chenango River is located over a mile from Osborne Creek, as a result of dispersion and dilution, it is not likely that this compound would be detectable in any appreciable concentrations in the Chenango River.

Comment #3: A commenter asked what are the preliminary remediation goals (PRGs) that were selected for each of the constituents and what are the health effects of each contaminant?

Response #3: Since New York State has not promulgated cleanup standards for soil, PRGs were selected for each of the constituents of concern. The PRGs are derived from a variety of sources, including NYSDEC Technical and Administrative Guidance Memorandum No. 98-HWR-4046 (TAGM) objectives, site background, and site-specific risk-based calculations. A summary of the contaminants of concern and the corresponding PRGs can be found in Appendix II of the ROD. Several of the contaminants, such as PCBs, vinyl chloride, and arsenic, are known to cause cancer in laboratory animals and are suspected human carcinogens. Since there are more than 40 PRGs that apply to the soils at this Site, rather than listing the health effects of each compound, it is suggested that the commenter either review Appendix 5 (pages A5-1 through A5-47) of the *Final Baseline Risk Assessment-Human Health Evaluation* (December 13, 1996 by Life Systems, Inc.), which describes the toxicity summaries for selected chemicals of potential concern at the Site. More detailed information can be accessed through the Agency for Toxic Substances and Disease Registry's ToxFAQs webpage at http://www.atsdr.cdc.gov/toxfaq.html or by contacting the Agency for Toxic Substances and Disease Registry at the following address:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop E-29
Atlanta, GA 30333
Phone: 1-888-42-ATSDR or 1-888-422-8737

During Excavation/Site Cleanup

Comment #4: Several commenters asked what kinds of safety precautions will be taken during the excavation/transportation of the contaminated soil/sediment under the selected soil remedy. One commenter also inquired as to whether air sampling would be conducted and what noise levels are anticipated under this remedy.

Response #4: The health and safety of the on-site workers and of the community is one of EPA's primary concerns during construction. All activities will be performed pursuant to U.S. Occupational Safety and Health Administration regulations.

During the excavation of the contaminated soils and sediments, the installation of groundwater extraction wells, and the collection of samples, the on-site workers will wear appropriate personal protective equipment. In addition, decontamination procedures will be strictly followed to ensure that both personnel and equipment are free from contamination when leaving the work site, either at the end of each day, during scheduled breaks, and/or upon completion of the project. For example, a decontamination procedure for the excavation equipment may involve vacuuming, wiping, scraping, hosing, or steaming the exterior of the equipment on a decontamination pad and collecting the wash fluids prior to treatment/disposal.

During excavation/grading and other on-site construction activities, Site perimeter monitoring will be performed for both noise and air emissions. If at any time, the measurements exceed the action levels approved by EPA, work would be immediately stopped so that appropriate control measures can be instituted.

Based upon experience at other sites, it is anticipated that the noise level during excavation/grading and construction will not exceed 85 decibels, which is equivalent to the noise that a diesel truck would make at 40 mph at 50 feet away.

Comment #5: A commenter asked how many truckloads of material will be transported from the Site and whether this increase in truck traffic will likely increase the possibility of traffic accidents. The PRP Group

commented that considering the fact that the excavated soils and sediments would have to be transported 500 miles to a treatment/disposal facility in Belleville, MI, the Proposed Plan did not adequately address the short-term risks (primarily attributable to traffic accidents) associated with the implementation of the preferred remedy.

Response #5: Under the selected soil remedy, it is estimated that approximately 50,000 cubic yards (cy) of contaminated soil/sediment will be excavated and transported off-site. The same quantity of clean fill material will need to be brought to the Site for backfilling the excavated areas. This combined volume would require approximately 6,000 truck loads to be brought in and taken out of the Site, during the six-month estimated construction period (approximately 47 truck loads per work day for 128 work days in six months).

It is EPA's intention to minimize any inconveniences to the local community in the implementation of the selected remedy and to insure the protection of public health and safety. Admittedly, this increase in truck traffic would increase the chance of traffic accidents. All precautions will be taken to prevent such occurrences.

The detailed analysis of alternatives consists of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria. Short-term risks are evaluated under one of these nine criteria, namely, short-term effectiveness. While the selected remedy poses an increased risk of traffic accidents, thereby making this alternative the least preferred alternative under this particular criterion, when considered against the other evaluation criteria, only excavation and off-site treatment/disposal and on-site incineration would be protective of public health and the environment and consistent with the residential/agricultural use zoning. While on-site incineration would pose significantly less risk of traffic accidents than excavation and off-site treatment/disposal, it is expected that on-site incineration would be the least attractive alternative under the community acceptance criterion.

Comment #6: A commenter questioned what has been done at this Site since it was listed on the Superfund National Priorities List (NPL) and requested that the remediation of the Site begin immediately.

Response #6: Following the listing of the Site on the NPL on October 4, 1989, EPA performed an investigation to identify those parties who were legally responsible for the conditions at the Site, and therefore, responsible for paying to investigate and clean up the Site. In May 1992, EPA entered into a consent order requiring a number of the PRPs to perform a remedial investigation and feasibility study (RI/FS) to

determine the nature and extent of the contamination at and emanating from the site and to identify and evaluate remedial alternatives. The investigation took a number of years to complete because the extent of the contamination turned out to be much greater than was originally anticipated and the scope of the investigation had to be expanded several times.

However, while the remedial investigation and feasibility study was ongoing, in September 1996, as a result of the investigative work at that time, EPA issued another order on consent to a group of PRPs requiring them to locate, characterize the contents, and properly dispose of all containers, drums, tanks, and debris located on-site and decontaminate, demolish, and dispose of all buildings and structures. This work was completed in January 1997 and served to address the immediate risks presented by contamination at the Site.

Following the conclusion of the RI/FS, EPA issued a Proposed Plan in January 2000 to propose a remedy to address the contamination at the Site. EPA anticipates that its remedy selection will become final with the issuance of a Record of Decision which is expected this spring. Once a remedy is selected, EPA will commence negotiations related to the performance of the design and construction of the selected remedy with the PRP Group. Should these negotiations result in a settlement, the PRPs will perform the necessary work. If the negotiations do not result in a settlement, EPA can order the PRPs to undertake the work or can use Superfund monies to perform it. Under all of these scenarios, it is anticipated that construction will commence by the Spring of 2002.

Comment #7: A commenter asked what would happen if soil contamination is found deeper than what is expected based on the RI.

Response #7: Post-excavation soil samples will be collected at the sides and bottom of the excavations to verify that all materials exceeding the cleanup levels have been removed. If these samples show contamination, further excavation would be necessary. It should be noted that contaminated soils will only be excavated to the water table. The contaminated soils below the water table will be addressed through the groundwater remediation component of the selected remedy.

Groundwater Remediation

Comment #8: A commenter wanted to know whether the groundwater extraction system called for in the selected remedy would impact the yield of the residents' private wells.

Response #8: Under the groundwater remedy, the pumping of contaminated groundwater at the Site will likely cause changes to the groundwater flow direction and water levels in the unconsolidated water bearing zone (the upper aquifer), where the contaminants are located. However, since all of the nearby residential wells draw from the deeper bedrock aquifer, there should not be an impact on the yield of the private wells.

Property Concerns

Comment #9: A commenter asked whether nearby residences could get their properties reassessed so that their tax burden could be reduced to reflect the reduced value resulting from their properties' proximity to a Superfund site.

Reponse #9: Any property owners who feel that their properties have been devalued as a result of their proximity to the Site should contact the appropriate Broome County taxing authority.

Comment #10: A commenter asked whether monitoring of private wells will continue after the cleanup of the Site.

Response #10: Monitoring of nearby residential private wells will continue until groundwater standards are met in on-site monitoring wells.

Ecological Risks

Comment #11: A commenter asked what would prevent animals from burrowing into the cap and exposing themselves to the contaminated soil under Alternative SS-2 (capping). The commenter also asked whether contamination would still travel to the groundwater under this alternative.

Response #11: Under Alternative SS-2, fencing would be used to deter human trespassers and animals from accessing the Site. Even if animals were able to bypass the fence and burrow into the cap, the majority of burrowing animals dig only to shallow depths (the cap would be a minimum of 2 feet thick). Nevertheless, routine inspection and maintenance of the cap would be necessary to repair any damage from burrowing animals.

Capping would minimize the infiltration of rainwater and transport of contaminants from the soil to the groundwater. However, since there are contaminants that are present in the saturated (below the water table)

soils, capping would not prevent contaminants from leaching from these soils. These soils would need to be addressed through a groundwater remedy.

Comment #12: A commenter asked if any contamination was found in earthworms.

Response #12: Earthworms were collected from several on-site and background locations. At the on-site locations, earthworms were purposely collected in areas of high chemical concentration. PCBs were detected in all tissue samples (including background), and several pesticides (chlordanes, dieldrin, gamma-BHC, endosulfan) and phthalates were detected in earthworm tissue samples collected from the on-site samples. The presence of these chemicals indicates that bioaccumulation is occurring in earthworms.

Alternative SS-2 (Capping Alternative)

Comment #13: A commenter asked whether EPA would have accepted the capping alternative if the property had been re-zoned to industrial.

Response #13: EPA has determined that the capping remedy is not protective of human health for the reasonably-anticipated residential and/or agricultural future land use for the property. EPA's future land use assumption was formed by, among other things, the current residential/agricultural zoning for the Site. If the zoning had been changed to "industrial," EPA would have considered that, among other factors, in making its future land use assumptions. If EPA had assumed that the future land use was industrial, it would have performed a risk assessment to see if the capping remedy would have been protective for such use. As such, since there is a likelihood that a cap may be protective of human health under a future industrial land use, the capping alternative might have been EPA's preferred remedy if the property had been re-zoned to industrial.

Comment #14: The PRP Group cited a dozen EPA Superfund sites, of which eleven are Region II sites (New York and New Jersey) and one is a Region IV site in North Carolina, where institutional controls and containment have been applied when excavation has been proven to be impractical or unnecessary.

Response #14: Seven of the eleven EPA Region II sites and the one Region IV site cited by the PRP Group are current or former municipal

and/or industrial landfills, and the areas of the landfills range from 8 acres to greater than 80 acres. EPA generally considers containment (capping) as an appropriate response action, or "presumptive remedy," for landfill sites, because treatment usually is impracticable due to the large volumes of contaminated material and/or the inability to specifically locate the sources of hazardous constituents in the landfill. Unlike the eight sites cited by the PRP Group, the volume of the contaminated soil at the Site is relatively small. Therefore, excavation is not impractical.

The four remaining sites cited by the PRP Group are discussed below.

Because the Forest Glen property was originally zoned residential, the selected remedy was excavation. However, when the property was re-zoned light industrial after all of the residents were permanently relocated, the remedy was changed to include excavation of contaminated soil, followed by its consolidation under an 8.5-acre cap. EPA determined that the reasonably-anticipated future land use of that site would be industrial, and EPA then determined that a capping remedy would be protective for that land use. Since the Tri-Cities Barrel Site is zoned residential/agricultural, and based upon other factors relied upon by EPA in accordance with its land use guidance, EPA determined that the anticipated future land use of the Tri-Cities Barrel site, unlike that of the Forest Glen site, would be residential or agricultural. Thus, EPA sees no inconsistency between the original Forest Glen remedy and the selected remedy for the Tri-Cities Barrel Site.

The Malta Rocket Fuel Area property is zoned industrial. The remedy *includes, among other things, the excavation and off-site* treatment/disposal of contaminated soil and the treatment of the groundwater for drinking water purposes. The remedy also includes the implementation of institutional controls, which may include new deed restrictions, to prevent ingestion of contaminated ground water, to restrict withdrawal of ground water within the vicinity of the plume that could adversely impact ground water remediation, and to restrict the property to its current commercial/industrial land use. Therefore, this site is not *an example of a site where institutional controls and containment have* been applied when excavation has been proven to be impractical or unnecessary.

The remedy for the Rosen Brothers site, an industrial property, includes the excavation of 4 "hot spots," the off-site treatment/disposal of the highly contaminated soils from these hot spots, and the consolidation and disposal of soils containing low levels of contaminants on an on-site 3-*acre construction and demolition debris landfill under a cap. In addition,* a surface cover will be placed over 17 acres of the site to prevent direct contact with residual levels of contaminants in site soils. The remedy

also includes taking steps to secure institutional controls, such as deed restrictions and contractual agreements, as well as local ordinances, laws, or other government action, for the purpose of, among other things, restricting the installation and use of groundwater wells at and downgradient of the site, restricting excavation or other activities which could affect the integrity of the cap/site-wide surface cover, and restricting residential use of the property in order to reduce potential exposure to site-related contaminants. Under this remedy, excavation of the hot spots, containment, and institutional controls were determined to be appropriate because excavation of the 3-acre landfill and 17 acres of residual contaminated soil was determined to be impractical. Unlike this remedy, the volume of the contaminated soil at the Tri-Cities Barrel Site is relatively small. Therefore, excavation is not impractical. Moreover, while the Rosen Brothers site is an industrial property, EPA has determined, that the reasonably-anticipated future land use of the Tri Cities site is residential/agricultural.

For the York Oil Site, the remedy calls for the excavation of approximately 40,000 cy of contaminated soils and sediments located both on the property (which was an oil recycling facility) and in adjacent wetlands that were contaminated by the operations at the facility, solidification/stabilization of the excavated soils and sediments, and on-site disposal under a cap. The remedy also includes groundwater treatment in combination with monitored natural attenuation of the groundwater plume. Institutional controls will be put into place to prevent the installation of private wells in the downgradient area. Since it is practical to excavate approximately 40,000 cy of contaminated soils and sediments to depths of up to 20 feet at the York Oil Site, EPA believes that it is not impractical to excavate approximately 50,000 cy of contaminated soils to an equivalent depth at the Tri-Cities Barrel Site.

In summary, while institutional controls and containment may have been appropriate for a number of the sites cited in the PRP Group's comment, since, for the most part, these sites have little in common with the subject site, one cannot conclude that institutional controls and containment are appropriate for this site.

Comment #15: The PRP Group indicated that they believe that future land use should be based on the existing deed restrictions, not only zoning requirements. The PRP Group also questioned the extent to which the Town's zoning requirements prevented the selection of its proposed soil capping alternative.

Response #15: A threshold criterion for the selection of a Superfund remedy is that the remedy must be protective of human health. EPA determines "protectiveness" in terms of EPA's belief as to the reasonably-anticipated future land use of a property. A property that will be used for residential or agricultural purposes would require a more comprehensive, and generally more costly, cleanup than that required for a property which would likely be used for industrial purposes. Based upon the requirements of EPA's land use guidance (see *Land Use in the CERCLA Remedy Selection Process*, OSWER Directive 9355.7-04, May 25, 1995, (1995 WL 457568 OSWER)), EPA considered several factors, including the existing deed restrictions, current zoning, and community desires and expectations, to enable it to determine the expected future land use of the subject property.

In 1996, the PRP Group entered into an agreement with Tri-Cities Barrel, the owner of the real estate at the Site, which created "deed restrictions" intended to allow the PRP Group to control real estate activities at the Site, including the right to prevent residential use on certain areas of the Site.

The Fenton Town Board, after discussing the zoning of the Site with both the PRP Group and EPA in late 1999, decided that the current residential/agricultural zoning would not change. In addition, the community at the public meeting and in letters submitted to EPA during the comment period has indicated that it wants and expects the Site to be fully restored for residential/agricultural use.

EPA considered the existence of the deed restrictions in the context of the circumstances mentioned above and, in accordance with the land use guidance, decided that the reasonably-anticipated land use for the Site is residential/agricultural. Once that decision was made, it followed that only excavation and off-site treatment/disposal and on-site incineration would be protective remedies for the reasonably-anticipated residential and/or agricultural future land use for the property. The PRP Group's proposed soil capping alternative, on the other hand, would not be protective for the reasonably-anticipated residential and/or agricultural future land use.

Comment #16: The PRP Group commented that the "hot spot" removal efforts would remove over 40 percent of the mass of contaminants and therefore substantially meet the Comprehensive Environmental Response, Compensation, and Liability Act's (CERCLA's) preference for treatment.

Response #16: EPA is unaware of how the PRP Group arrived at the 40 percent mass. Using the information in the Proposed Plan, which is based on the FS, the percentage of the volume of impacted soil that would be taken off-site for disposal under the capping alternative, Alternative SS-2, was calculated based on the ratio of the volume of the excavated principal threat waste to the volume of all excavated soil/sediment from the off-site disposal alternative (7,750 cy/50,000 cy). This calculation yields 15.5 percent.

At the public meeting, the PRP group indicated that all excavated material would be taken off-site for disposal in its modified capping (Alternative SS-2) scenario. If the volume is recalculated based on the information presented by the PRP Group at the public meeting, then the percentage of the volume from the excavated principal threat waste (7,750 cy) plus the excavated material from North of I-88 and South of Osborne Hollow Road (3,100 cy) plus the excavated sediment from the tributaries (1,900 cy) divided by the volume of all excavated soil /sediment from the off-site disposal alternative (50,000 cy) would be 25.5 percent (12,750 cy/50,000 cy).

Comment #17: The PRP Group commented that its proposed remedy presented at the public meeting substantially satisfies the statutory preference of CERCLA for a permanent solution, and noted a number of items which the PRP Group felt should be given further consideration: known sources of groundwater contamination and contaminated sediments would be removed under the PRP Group's proposed remedy; EPA has selected containment remedies at sites including those far more contaminated than the Tri-Cities Barrel Site; EPA has described engineered caps as permanent structures that prevent direct exposure of human and ecosystem populations and prevents contamination of groundwater; an existing deed restriction would prevent the disturbance of any cap installed at the Site and would ensure the permanence of the remedy; because low-level threats would remain on-site under the PRP Group's proposed remedy, CERCLA would require that the remedy be reviewed every five years, thereby ensuring the permanence of the remedy; and over 75 percent of the Site would be remediated under the PRP Group's proposed remedy in the same fashion as the selected remedy and the remaining 25 percent of the Site would be capped with a barrier to prevent direct exposure to and minimize, if not eliminate, migration of low-level threats (a permanent solution to minimize future impacts to human health and the environment).

Response #17: Although known sources of groundwater contamination and contaminated sediments would be removed under the PRP Group's

proposed capping remedy, containment remedies have been selected by EPA at numerous sites, EPA has described engineered caps as permanent structures, and five-year reviews would ensure the permanence of the remedy, containment of the contamination at this site would not be protective of the human health and environment due to the reasonably-anticipated residential and/or agricultural future land use of the property. Deed restrictions would not, by themselves, determine the Site's reasonably-anticipated future land use, control the actual future land use of the Site, or serve to make the remedy protective.

EPA does not know how the PRP Group concluded that 75 percent of the Site would be remediated under the PRP Group's proposed remedy in the same fashion as the selected remedy. However, using these numbers, since 25 percent of the Site would still be capped, considering the anticipated residential/agricultural future use for the Site, the proposed capping remedy still fails to meet the initial "threshold" criterion of overall protection of human health and the environment.

Cost Estimates

Comment #18: A commenter asked about the reliability of the estimated costs and remediation time frames.

Response #18: The cost estimates are based upon past experience and quotes from vendors. Typically, costs in FS reports are in the range of +50% to -30%. These costs are further refined during the design. The estimated remediation time frames are also based upon past experience and will also be refined during the design.

There are many variables which can affect the remediation costs and time frames. Soil samples collected during the design to define the limits of excavation could indicate greater amounts of contamination or during the excavation work, more extensive contamination might be found. A significant increase in the volume of contaminated soil would increase the estimated excavation time, transportation costs, treatment/disposal costs, and the remediation time frame. Increases in fuel costs would increase transportation costs and changes in off-site treatment/disposal facility charges would affect the treatment/disposal cost. The construction time frame (and costs) could also be influenced by adverse weather conditions.

Comment #19: A commenter asked who would pay for the improvements (such as a park or a nature trail) proposed by the PRPs should the capping alternative be selected.

Response #19: While the capping alternative was not selected, if it had been, any post-remediation improvements to the property would be beyond the scope of EPA's authority. Any improvements, however, would have needed to be approved by EPA to insure that they would not have an adverse impact on the long-term integrity the cap.

Comment #20: The PRP Group expressed concern that the selected remedy is not cost-effective. The PRP Group also indicated that they believe that capping is fully protective of human health and the environment and satisfies all ARARs.

Response #20: For the following reasons, EPA has determined that the selected remedy provides for overall effectiveness in proportion to its cost.

Four soil/sediment remedial alternatives were considered: no action; capping; excavation and off-site disposal/treatment; and on-site incineration. Pursuant to the NCP, the initial "threshold" criterion for a remedial alternative to be eligible for selection is whether it would achieve overall protection of human health and the environment. In other words, the NCP requires that each remedial alternative be first analyzed to determine whether or not it would provide adequate protection, *i.e.*, to what degree would it eliminate, reduce, or control risks posed through each exposure pathway. In accordance with the Land Use Guidance, EPA has determined that the reasonably-anticipated future land-use of this Site is residential and/or agricultural. Therefore, the capping remedy would not adequately protect potential future Site residents or consumers of crops grown on the property from the risks posed by the contamination to be left at the Site under this alternative. Although the capping alternative is less costly than the selected remedy, containment of the contaminated soils and sediments would not achieve overall protection of human health and the environment nor would it be consistent with local zoning requirements.

The selected remedy is, however, protective of public health and the environment, able to achieve ARARs as quickly, but at substantially less cost than Alternative SS-4, excavation and on-site treatment, the only other protective remedy.

Evaluation Process

Comment #21: A commenter asked whether the nine evaluation criteria are in any particular order.
Response #21: The evaluation criteria are placed into three groups. The first two criteria, overall protection of human health and the environment and compliance with ARARs, are referred to as "threshold" criteria. These two criteria must be satisfied by any alternative in order to be eligible for selection. Long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, and cost are "primary balancing" criteria, and are used to make comparisons and to identify the major tradeoffs between alternatives. State acceptance and community acceptance are "modifying" criteria and are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was discussed in the Proposed Plan.

Community Relations

Comment #22: A commenter indicated that EPA should do a better job of informing the community of the public meeting.

Response #22: A copy of the Proposed Plan was sent out to all residents within a mile radius of the Site. A press release identifying, among other things, the meeting time and place was issued to the local media (television and radio stations) on January 21, 2000. A public notice identifying the same was published in the *Press and Sun Bulletin* on January 22, 2000. Nevertheless, EPA will seek in the future to further enhance our outreach efforts.

Risk Assessment

Comment #23: The PRP Group commented that while they understand that the EPA risk assessment policies promote the use of conservative default exposure assumptions, EPA did not provide in the Proposed Plan and the risk assessment candid discussions of the effect of default exposure assumptions on the resulting risk estimates. In particular, the following site-specific issues were not taken into consideration and inappropriate assumptions were made: 1) lack of access to parcel North of I-88 due to legal entrance and exit restrictions associated with I-88; 2) risk characterization assumed that the future residents will use the till aquifer as potable water supply; 3) potential risks from gardening were

overestimated because the risk assessment used models that ignored the site-specific plant sampling data presented in the RI; and 4) considerable bioconcentration of PCBs and chlordanes into vegetable is assumed.

Response #23: The access to parcel North of I-88 is severely restricted. However, the obstacles to future road development are not impossible to overcome (i.e., if there are legal entrance/exit restrictions associated with I-88, then there are three other sides to access this parcel). Even without legal access, trespassers can still be exposed to contaminated soils and the parcel is accessible by a variety of personal recreational vehicles.

While the current residents located in the vicinity of the Site use the bedrock aquifer, under the future-use scenario, the risk assessment assumed that a drinking water well could be installed anywhere in the plume, including in the till. This approach is consistent with *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, Part A* (EPA/540/1-89/002), which states, " . . . it generally should be assumed that water could be drawn from anywhere in the aquifer, regardless of the location of existing wells relative to the contaminant plume."

To determine the risk from human vegetable intake, co-located plant and soil samples would have had to been collected to derive site-specific bioconcentration factors. However, the RI plant samples that were collected were representative of animal forage vegetation (grasses, clover, and woody shrubs), which are not representative of leafy, fruit, and tuber portions of homegrown vegetables that are used as human food.

In accordance with the *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, Part A* (EPA/540/1-89/002), one should "use the open literature or computerized databases to obtain [soil to plant partition] coefficients from field, microcosm, or laboratory experiments that are applicable to the type of vegetation or crop of concern... In the absence of more specific information, use general bioconcentration factors published in the literature that are not crop specific." Since the plant samples collected during the RI by the PRP Group's contractor were representative of animal forage and not specific to human use, the risk assessment appropriately used a general bioconcentration factor to calculate human health risk assessment.

By not having co-located soil and plant samples available, and by biasing the plant samples to those species used for animal fodder, development of site-specific bioconcentration factors would not have been scientifically defensible.

With regard to the bioaccumulation of PCBs and chlordane, these compounds have a high bioaccumulation potential in root vegetables.

Comment #24: The PRP Group commented that the Proposed Plan misapplied EPA's regulations and guidance with regard to using soil TAGM cleanup objectives as an ARAR.

Response #24: There are currently no promulgated standards for contaminant levels in soils, only TAGM objectives, which are "To-Be-Considered" cleanup objectives. TAGM objectives have been consistently used as soil ARARs at Superfund sites in New York State.

There are federal and New York State ARARs for contaminant levels in groundwater. Because contaminants in soil may leach into the groundwater, TAGMs were developed to identify maximum contaminant levels that could be left in the soil and still achieve groundwater ARARs.

Comment #25: The PRP Group expressed concern that combining the soil exposure concentrations for the entire South of I-88 area (which consists of the former lagoon, drum processing, former drum storage, barrel burner, and process building areas) in the Proposed Plan misleadingly implies that the entire South of I-88 area presents risks to human health. They also state that the Proposed Plan misleadingly indicates that the entire North of I-88 area presents a hypothetical risk to human health. The risk assessment derived soil exposure point concentrations for the North of I-88 area by combining data from all of the soil sample locations north of the freeway. This data grouping ignores the fact that the soil contamination is localized around the man-made pond and the rest of the northern area is relatively uncontaminated.

Response #25: Although the risk assessment applied a very conservative approach and combined the soil exposure concentrations for all locations within South of I-88, and it did the same for the North of I-88 area, the remediation of the soil in both areas is being driven by the need to protect groundwater from contamination in soils that exceed cleanup levels. For example, only the contaminated soil around the man-made pond in the North of I-88 area will be remediated.

Comment #26: The PRP Group commented that the Proposed Plan and the risk assessment misrepresented the potential for exposure to contaminated groundwater in the area North of I-88.

Response #26: The affected groundwater at the Site appears to be restricted to the South of I-88 area. However, because of the predominantly north to northwest direction of the groundwater flow and the close proximity of highly contaminated wells in the South of I-88 area to the North of I-88 area, the risk assessment assumed a future groundwater consumption risk in the North of I-88 area.

In addition, New York State anticipates that groundwater will be restored to its beneficial use.

Enforcement Concerns

Comment #27: A commenter asked what is the liability and responsibility of the property owner. Is there any responsibility by the Town board?

Response #27: Under the Superfund law anyone who owns or operates a Superfund site, as well as all persons who arranged for disposal or treatment of hazardous substances at the site and persons who transport such hazardous substances to the site are responsible for the cost of investigating and remediating the site. Under the law, all responsible parties are jointly and severally responsible, which means that each liable party is responsible for all of the cleanup costs. The law provides a mechanism for the responsible parties to allocate the costs among themselves.

In this case, EPA has determined that the owner of the Site, Tri-Cities Barrel and its principals who conducted the operations, including Gary Warner, are potentially liable parties. However, EPA believes that the Tri-Cities Barrel Company has become defunct and that Gary Warner lacks the financial resources to make a meaningful financial contribution toward the cleanup costs. EPA directed certain enforcement activities against Tri-Cities Barrel and Gary Warner, including EPA's requirement that they cooperate by providing critical information about the Site, as well as Site access. However, EPA has looked to other PRPs for a financial contribution and understands that those other PRPs have entered into financial agreements with Tri-Cities Barrel and Gary Warner. EPA has reserved all of its enforcement options with respect to all PRPs at the Site and may seek financial contributions from Tri-Cities Barrel and/or Gary Warner in the future should that become appropriate.

EPA has no information to suggest that either the Town of Fenton or the Town Board would have any legal responsibility under the Superfund law with respect to the Site.

Comment #28: A commenter asked for a list of the PRPs for the Site.

Response #28: To the best of EPA's knowledge, the PRP Group consists of a subset of the 51 entities listed in the Appendix V-d. All of these parties were notified by EPA of their potential liability; some of them may now be defunct or insolvent. At this time, each of these parties is considered by EPA to be liable for the performance of the Site Remedial Design and Remedial Action. It should be noted that because EPA is not privy to the organization of the PRP Group, the current slate of PRP Group members is not known to EPA.

Comment #29: A commenter asked whether a PRP was ever removed from the list.

Response #29: EPA has never officially withdrawn a PRP's designation at this Site. However, EPA entered into two *de minimis* Administrative Orders on Consent (in March of 1996 and July of 1997, respectively) in which 28 smaller volume generator parties settled with EPA for their total Site liability. Thus, under the terms of these settlements, the *de minimis* parties have already paid their fair share of the costs of performing the Remedial Design and Remedial Action, and EPA will not seek their participation in this work.

Comment #30: A commenter asked whether EPA or the New York State has taken any criminal action against Mr. Warner. The commenter also asked whether any criminal action was taken against the PRP Group.

Response #30: The State of New York has successfully pursued criminal enforcement action against both Gary Warner and Tri-Cities Barrel After unsuccessful attempts by the State to effectuate permanent improvements in Tri-Cities Barrel waste handling practices, Tri-Cities Barrel and Gary Warner were arraigned by the State in April of 1983 on four hazardous waste misdemeanor charges: for failure to label hazardous waste; failure to store hazardous waste to prevent leaking; failure to obtain chemical analyses of waste; and failure to prevent leachate discharge. Gary Warner and the company were convicted upon a plea of guilty to the failing to label and to prevent leaking charges and sentenced to pay a $2,000 fine, sentenced to a conditional discharge of one year and were required to undertake corrective measures at the facility.

EPA has never pursued criminal enforcement action against Gary Warner

or Tri-Cities Barrel. However, EPA has used civil enforcement mechanisms in both the Resource Conservation and Recovery Act (RCRA) and CERCLA against Tri-Cities Barrel. In 1980, Tri-Cities Barrel filed a Notification of Hazardous Waste Activity and Permit Application with EPA pursuant to RCRA; this permit application was later withdrawn by Tri-Cities Barrel. EPA first brought a RCRA action against the company in 1984, ordering it to comply with RCRA regulations for drum labeling and inspection. Through EPA's efforts to enforce RCRA regulations against Tri-Cities Barrel (and New York's efforts under similar State law), significant improvements in the company's handling of its liquid wastes were achieved beginning in the early 1980's. EPA began using its enforcement mechanisms under CERCLA against Gary Warner and Tri-Cities Barrel in 1990-91 to bring about the remediation of the Site.

Neither EPA nor the State of New York has taken any criminal action against the individual members of the PRP Group (other than Tri-Cities Barrel or Gary Warner, to the extent they are members of the PRP Group), or the PRP Group itself, with respect to the Site. Rather, the individual PRPs involved with the Site have been found by EPA to be potentially responsible under CERCLA's civil liability provisions for the costs of remediating the hazardous substances at the Site.

Miscellaneous

Comment #31: The PRP Group commented that the EPA should clarify that the excavation will not extend below the water table.

Response #31: In response to this comment, EPA has made a clarification in the ROD.

Comment #32: The PRP Group asked how a material can fail Toxicity Characteristic Leaching Procedure (TCLP) testing, yet satisfy the TAGM objectives.

Response #32: Concentrations of heavy metals may meet TAGM objectives, but fail TCLP testing.

APPENDIX V-a

LETTERS SUBMITTED DURING THE PUBLIC COMMENT PERIOD

February 5, 2000
Mr. Young S. Chang, Project Manager
United States Environmental Projection Agency
290 Broadway 20th Floor
New York, Ny 10007-1866

Dear Mr. Chang,

This correspondence is written in response to the Superfund Proposed Plan and your Request for comment. This response provides comments and asks questions that have Not been adequately addressed.

Specifically, we would like to express our desire to move forward with the preferred Remedy involving the excavation/dredging of contaminated soils and sediments, followed by off-site treatment/disposal, and extraction of on-site treatment to address the contaminated groundwater.

This means that we do not agree with:
SS-1 (no action) since it does not actively address health and ecological risks by contamination

SS-2 (excavation with a Multi-Layer Cap) It leaves too much contamination in place

SS-4 (excavation with incineration) Not recommended due to the long permitting process and the possibility of affecting residents to air contaminants

GW-1 (no action for the groundwater)

GW-2 (natural attenuation) is not protective of the groundwater

Also, review of the Superfund Proposed Plan left us with the following questions:

- What about the contamination under I-88
- What is the plan of action to clean up that area
- How is the EPA addressing the Chenango River....Osborne Creek (or a direct Tributary) that discharges directly into the Chenango River
- Has any evaluation or studies taken place
- What studies have been done on ground water flow during "normal", and "Flood/drought" conditions..
- We had requested testing of our groundwater several years ago, however, the Result of the testing were never provided to us. Why Not..???? What were the results..?? Will the monitoring of our well continue..?? We believe it should..!!
- We are concerned about the stigma of living less than 1 mile from a SuperFund site (The designation given to the "**MOST**" contaminated type of site). What consideration has been given to the residents living in the area..?? At minimum, we would expect our property taxes to be lowered since the property values have declined. No one wants to live next to or near a SuperFund site.

On February 4, 2000 in the Press & Sun Bulletin (copy attached) a representative from Ashland Chemical was quoted as saying that a Multi-Layer Cap option was being considered

- Further, they were willing to bribe the public with a park if this option was selected. This was not our understanding of the SuperFund Proposed Plan that the EPA had reviewed and selected. We believe residents in this area agree that this site will probably never be cleaned up, however, to leave contamination in place to save money is ridiculous. The Multi-Layer option should not be implemented. We Think residents may consider a park after excavation and removal since the site will never be fit for residential use, but not in conjunction with a Multi-Layer Cap.
- Has a Health Effect Study been done in the area? Many people in the area have Become sick. This should be reviewed.
- What effect will a Pump and Treat System have on the current groundwater flow availability and direction
- What is the volume being considered
- Will this affect available groundwater, especially in drought conditions? (last Year's drought for example)
- What precautions will be taken during excavation and removal
- Will air sampling occur?
- What about the increase in truck traffic and the possibility of an accident on the Highway? We typically walk along this route and want to ensure that airborne Contaminants are not an issue
- If this site has attained a risk of 2X10 minus for some contaminants (for every 10 people that could be exposed, two extra cancers may occur as a result of exposure) **WHY** has it taken so long to get to this point. This site was placed on the **NPL** on October 4, 1989. While we appreciate the removal of drums, etc, 11 years with no additional cleanup is unacceptable. Further, it does not look as though any soil or groundwater remediation will occur for several more years.

- **This is unacceptable**

There are provisions under **CERCLA.** (Comprehensive Environmental Response Compensation Liabilities Act) to expedite cleanup and we expect action within six months

- Besides Ashland Chemicals who are the **PRP's**
- Was a **PRP** ever removed from the list
- What was the reason
- What are the **PRG's** that were selected for each of the constituents
- What are the health effects of each of the contaminants found on-site? Please provide a chart with the maximum contaminant levels with the PRG's that have been selected and the respective health effects
- Has criminal action against Warner been pursued. Why or why not
- What about the **PRP's** if they knew of the disposal mechanisms by Warner
- What are the anticipated noise levels during excavation and what will be done to

Minimize the noise

- How many truckloads of material will be transported
- Were the PRP's allowed to accrue interest on the cleanup costs rather than use the money to cleanup the site at an earlier date
- Do you know that people currently fish , swim, carry on recreational activities, obtain bait for fishing from the Chenango River directly in line with the SuperFund site
- Documents state it is already been found in the food chain.
- What has been done about this

In closing we are concerned the EPA has determined that "actual or threatened releases of hazardous substances from the site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health, welfare, or environment". This is alarming in two ways. First the EPA's preferred alternative may not be implemented & second that it is not being appropriately prioritized to minimize health and environmental effects. Once again **11+ years** is too long.

Thank you in advance for addressing our questions. If it is possible, we would like to receive answers to these questions within the next two weeks. Thanks for your assistance.

Sincerely,

Mr. & Mrs. John Rogers
(607) 648-7643
PO Box 110
Port Crane, Ny 13833

Cc: Press & Sun Bulletin
Editor of Press & Sun bulletin
Reporter Tom Wilber

From: <Keevink@aol.com>
To: R2NYC04.R2OSWSF1(CHANG-YOUNG)
Date: 02/13/00 (Sun) 7:12 pm
Subject: Tri-Cities Barrel Co.site cleanup.

To whom it may concern: Please add our voices to those opposing any compromise in the cleanup plan. Thank you.

Keevin and Cheyanne Kenyon
56 Pleasant Hill Rd.
Port Crane, New York 13833
(607) 648-9710

From: <JPrikazsky@aol.com>
To: R2NYC04.R2OSWSF1(CHANG-YOUNG)
Date: 02/15/00 (Tue) 9:49 pm
Subject: Tri-Cities Barrel site

Dear Mr. Chang

In regard to the Tri-City Barrel, Superfund site, in the town of Fenton. I believe the best solution to the situation is the removal of the contaminates. The alternative approach of capping off sections, may be less expensive, but leaves the opportunity for future problems. The money is available now to solve this problem in the most complete manner.

If the capping method, failed in the future, will there be federal funds, and how many years of delay, to again correct a problem that could have been solved years earlier and with cheaper dollars.

This site is of particular concern to me, I own property adjacent to and west of the northern portion of the site. Can you inform me of the plans for this section of the site?

Thank you
John Prikazsky
(607) 772-6190

ain Identity

n: <postmaster@mail1.intermedia.net>
: <bob@vildngproduct.com>
t: Monday, February 21, 2000 5:12 PM
ch: ATT00038.dat; ATT00039.dat
bject: Delivery failure (chang.young@epamail.epa.gov)

ir message has encountered delivery problems
ne following recipient(s):

ng.young@epamail.epa.gov
very failed

able to deliver to destination domain
iled to deliver to domain epamail.epa.gov after 40 tries.
last error was:
n't connect to host

FAX: 212-637-3966

TO: MS. YOUNG CHANG - EPA

From: BOB PICHETTE

RE: TRI-CITIES BARREL SUPERFUND SITE

I TRIED TO EMAIL MY COMMENTS TO YOU, BUT MY EMAIL WOULD NOT GO THROUGH. SEE ABOVE.

PLEASE ACCEPT THESE COMMENTS ORIGINALLY SENT 2-19-2000.

THANK YOU.

Bob Pichette
2-23-2000

Main Identity

From: Bob Pichette <bob@vikingproduct.com>
To: <chang.young@epamail.epa.gov>
Sent: Saturday, February 19, 2000 4:41 PM
Subject: Tri-Cities Barrel Superfund Site

Dear Ms. Chang:

This is in response to the Proposed Plan for remediation of this site.

I respectfully ask you to propose alternative SS-2 as the preferred remedy for this site. It is protective of public health and the environment, cost effective, and would be implemented the soonest of all the alternatives since this is the preferred method of the PRP Group.

As I explained at the public meeting, we are a small company that has been unfairly dragged into this project. We have already paid a great deal of money to the PRP Group based on this being a $10 million to $12 million dollar site. If the EPA insists on doubling this cost, it will present a tremendous financial hardship on us. We are a small business with less than $1 million in annual sales. We have already paid over $71,000. I realize this seems like a small amount of money to you, in relation to the total cost of Superfund site cleanups. But please understand this is a huge amount of money to a company our size. If we have to continue to pay these huge sums of money, it will be a crushing blow to our business. New York State is trying to stop the flight of businesses from our state. Please consider our position as a small business in New York State trying to survive and maintain jobs in upstate New York.

The SS-2 alternative is a perfectly acceptable alternative. The EPA states this in the EPA publication of January 2000 announcing the proposed plan. It seems the EPA is basing their decision on the zoning classification, but the PRP's have permanent deed restrictions in place that prevent the property from being residential. In addition, the PRP's are prepared to purchase the property from Gary Warner if the SS-2 plan is approved. This will return the property to the tax rolls, instead of being delinquent as it is now.

The independent Hawk Engineering, P.C. report also concludes that this SS-2 remedy is appropriate for this site.

I see a real problem with all the excavation that the SS-3 remedy requires. The amount of dirt that must be dug up and trucked off site is tremendous. During the public meeting, the residents stated that the access to the property from Route 7 is a very dangerous one, relative to traffic and a blind turn. How does thousands of trucks in and out for many months impact public health and safety? In addition, this dirt has the potential to be spread outside the property by wind and with the dust created by all the heavy equipment. Despite the best precautions, some of this dirt will blow onto the neighbors property. Wouldn't it be better to cap the contaminated dirt instead of allowing it to be blown by the wind? It seems this is much safer for the neighbors, and also less disruptive of the area. This contaminated dirt will also be spread all over upstate New York as these trucks haul it on the highways to the landfill. It is virtually impossible to prevent some of the dirt from escaping the coverings of the trucks. Then this dirt will take up valuable landfill space unnecessarily. We are already facing a near crisis situation in the northeast with regard to running out of landfill space. Why waste landfill space on this dirt, when the dirt can be capped in place, and engineering studies confirm this will be safe for the environment and protective of public health.

Please look at the total picture here. Sometimes the preferred solution, if viewed in a vacuum, can seem like the best solution. But if you consider all factors, it might not be the best solution overall. Why assume the risks associated with such a large excavation when an acceptable alternative is available.

Let me use an example: the problem of asbestos piping in schools. When this was first discovered, the preferred method was to dismantle all the contaminated piping and remove it from the building. This was done in many schools throughout the northeast. But in some

ildings they discovered that the air actually became worse after the removal. How could
at be? They discovered that no matter how careful the precautions, some of the particles
caped during the removal process. The result was that the situation was worse than if
ey had done nothing. And it took a long time and a lot more money to correct the problem.
ome schools delayed removing the asbestos piping because they did not have the money
fund the removal right away. When these districts saw the results of some of the removals,
ay decided to seek another way with less risk. They discovered if they used a special mastic or coating
the asbestos piping, they could eliminate the airborne particles that
ere the immediate concern, and this alternative also eliminated the risk associated with
moving all the piping and potentially risking worse contamination from the removal process.
ney discovered a solution that protected the children and adults who worked in the buildings
it did not have the risks associated with removal, and it cost less money! A true win/win
lution for all.

Please consider the example of asbestos removal in relation to this superfund site. Maybe, removal is
t the best alternative for all concerned in this situation. The argument
n be made that the SS-2 alternative is actually safer for the surrounding community. The
RP Group is prepared to move ahead with SS-2, if approved, so this alternative will also
low this site to be removed from the NPL list quicker than the other alternatives. This seems
e a win/win solution for all involved.

Throughout this process, the PRP Group and the EPA have been able to work together
clean up the site. I hope this cooperation will continue in selecting a treatment remedy
at is beneficial to all parties.

Thank you for the opportunity to express my comments.

Sincerely,

Robert M. Pichette
General Manager
Underwood Industries dba Viking Products
P.O. Box 269
Waverly, NY 14892-0269
tel: 607-565-4551
fax:607-565-9650

February 16, 2000

To:

Young S. Chang Project Manager
United States Environmental
Protection Agency
290 Broadway, 28th Floor
New York, N.Y.
10007-1866

From

John V. Kopalek
161 NOLAN Rd
BINGHAMTON, New York
13904
607 7223736

Dear Mr Chang,

I grew up in the neighborhood of the Tri-City Barrel superfund site. The truth is my family was there FIRST. My father bought our property in 1935. It was very nice the streams were clear, the air was clean.

The only residences were farms. The Rail-Road property was even very well groomed (Section gangs were in charge of keeping each area free of any type of Brush or debris.

My road Nolan Road was not paved, we had no telephone we walked onto Old Rt 7 (now called Osborn Hollow Road) for our mail.

I moved to Nolan Rd when I was 6 months old into a very old dwelling.

As a small child my father taught me how to swim in Osborn Hollow Creek. The creek was gorgeous the water was drinkable, it had been in previous years stocked by New York State as a trout stream. There were several water powered mills over the years and the old buildings were still partially

there.

Some pools in the meandering creek were up to 8 ft deep. In Port Crane there were "bath houses" to change at first bridge. One popular swimming area was called "Hancock's grove". The whole area was magical and pristine, a treasure.

In 1955 (apx) some land was purchased We were told the owner was going to raise buckwheat. The menace grew. A small trailer park opened across from my property in the late 1950's.

Fenton had no Zoning

Any trip down to Osborn Hollow Creek revealed a stream of rust colored water pouring down a small ledge directly into the creek. It was interesting because on the South side

of the stream nothing grew (in or around the water). The stream was very distinct until it dissapeared with dilution down stream.

Tri-City Barrel became noisy with huge barrel trucks and burning of barrels was begun. I understand some contents and paint were burned. When environmental regulations were enacted the burning was mostly confined to foggy A.M. situations. So that the density of the smoke could not be measured (I assume). The smoke was noxious. Breathing outside was difficult. My calls to Broome County health were answered "Not our responcibility". Calls to D.E.C. were answered by "Poor Mr. Warner (the owner) Everybody is picking

on him", "he is trying to do the right Thing but his scrubbers are down".

In the meantime the neighborhood took a tumble. "Santi-Auto Wrecking" became a tri city neighbor. Then Green Bldt Metal Recycling had STACKS of cars 30 foot high and a car crusher on the old SANTi-site.

The trailer PARK went into full swing AND had over 70 trailers and maybe 200 people on a 3 acre lot!

When I was young the well we had was 22 feet deep. With the over population AT the trail park the water table dropped several hundred feet. Most wells in the neighborhood went dry and had to be re drilled several hundred

feet deeper.

The trailer park not only had no municipal water but also discharged sewerage into any available nearby stream.

The neighborhood had fallen apart.

In the mid to late 60's I-88 was cut directly thru Tri city Canal. In 1975 or 1976. A 4 inch downpour flooded the whole area and washed out the Rail Road tracks road Bed. Barrels from Tri-city canal washed into Port Clane and some washed away. A LOT of soil was removed by the flood.

In years soon after Tri-City started to become the target of legal ACTION (ALTHOUGH NOT very harsh) The lagoons were drained and covered with local soil.

The covering was called "AN impervious CLAY CAP" I found that amusing.

Superfund became a household word and the Broome County head of finance Ivan Mosdipt called the land "worthless forever".

Now after 45 years of folly, NO local enforcement AND much legal maneuvering we have a solution in sight.

A clean up will not return the area to the pristine setting it was in 1955 but it will be a bona fide attempt to reverse what can be corrected.

A plastic liner seems to be a temporary fix.

A LOT of people made a lot of money with their careless handeling AND Disposal of chemicals

Soil, air, and water were polluted. That started 45 or 46 years ago. There is no need for a community center it is time to take responcibility by the P.R.P.s and do a complete clean up anything else is a band aid measure.

I still own the property I have enclosed a section of the same Topographical map used in the presentation at Chemanyo Valley High school.

I am concerned that off site testing was not extensive enough. In the mid 70's We (my family) offered the D.E.C. a site for a test well. That offer is still good. My property is just over the the Rail Road trax from the Tri-City property

Probably less than 100 feet away. It would be a perfect site for a test well.

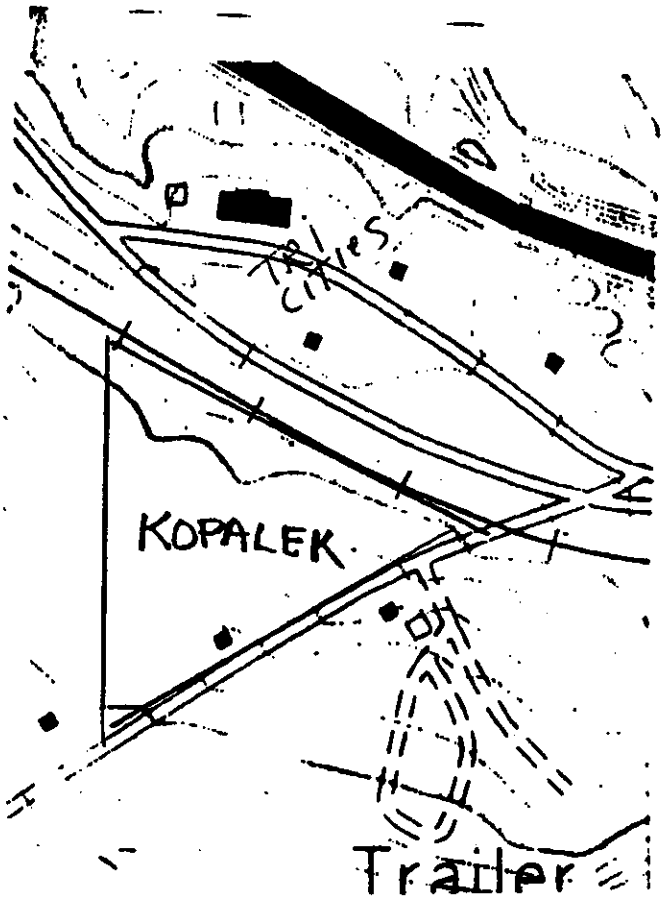
It is my understanding that it is possible to pull water to a low area of a watertable and thereby pull contamination. Similar things happened in Hillcrest N. York at the FINK site!

Please consider drilling a test well on my property Please do not consider anything but a full scale clean up at the Tri City barrel site.

Thank you
Sincerely
John J. Kopalek
(607) 722-3736

Here is a BLOW-up from the CHENANGO-FORK Quadrangle USQS MAP

My property is approximately a 600 ft TRIANGLE IN the center of the MAP. the top of the MAP IS NORTH AND IS the "Tri city BARREL" site



Broome County
Health Department
One Wall Street / Binghamton, New York 13901 / (607) 778-8885 / Fax (607) 778-2838
ENVIRONMENTAL HEALTH SERVICES - (607) 778-2887 / Fax (607) 778-3912

JEFFREY P. KRAHAM
Broome County Executive

CHARLES H. WOLFORD
Director of Public Health

February 16, 2000

Young Chang
New York/Caribbean Superfund Branch I
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007

Re: Tri-Cities Barrel Superfund Site
Town of Fenton, N.Y.

Dear Ms. Chang:

The Broome County Health Department (BCHD) would like to take this opportunity to comment on the proposed remedial plan for the Tri-Cities Barrel Superfund site. The BCHD concurs with the USEPA's preferred remedies for the site (excavation and off-site disposal of contaminated soils – SS3; groundwater extraction and treatment – GW3). These remedial alternatives are most protective of current residents living around the site, and future users of the site itself.

I can be reached at (607) 778-2887 if there are any questions concerning this matter.

Sincerely,

Robert W. Denz, P. E., Director
Environmental Health Services

RWD:ams
cc: Don Brown, Town of Fenton
site file

chang/rsb/rwd

NIXON PEABODY LLP
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Post Office Box 1051
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(716) 263-1000
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Direct Dial: (716) 263-1381
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February 22, 2000

Ms. Young Chang
New York/Carribean Superfund Branch I
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007

RE: Potentially Responsible Party Comments on the Proposed Remedial Action Plan
Tri-Cities Barrel Superfund Site, Fenton, New York

Dear Ms. Chang:

The Tri-Cities Barrel Potentially Responsible Parties (PRPs) respectfully submit the following comments that identify serious deficiencies in the Proposed Remedial Action Plan (PRAP) prepared by the U.S. Environmental Protection Agency (EPA). The PRPs urge EPA to give this information its utmost consideration while preparing the Record of Decision (ROD) to ensure that positive progress toward remediating the Site can be realized.

INTRODUCTION

The Site was and is owned by Tri-Cities Barrel (TCB). To facilitate implementation of the remedy, and to provide enforceable limitations on the future use of the Site, the property is now subject to recorded deed restrictions. These institutional controls strictly prohibit the future development of the property for residential use and require consent of the Group prior to any non-residential use development.

The PRPs have continued to collect data concerning the location and extent of contamination at the Site since the RI, FS, and PRAP were completed. Further sampling at the Site is still underway. As discussed below, the more recent data collected at the Site shows there is contamination that requires treatment and incineration to address the constituents of concern. This new information, which shows contamination near or resting on the marine silt layer, makes implementation of the partial and total excavation remedies considered in the FS and/or the PRAP and its supplements much more difficult, dangerous, and costly to implement than previously contemplated by EPA. We believe this represents a substantial change from the data upon which the EPA used to initially identify their preferred remedy.

The Group submits that the PRAP unjustifiably proposes a remedy for the Site - excavating and dredging approximately 50,000 cubic yards of soil and sediment - which is the most difficult,

dangerous, and costly to implement not withstanding the fact that a much simpler and more feasible remedy is available. The Group's preferred remedy is equally protective of health and the environment, yet can be implemented more easily and feasibly. The Group's preferred remedy involves excavating only the soil with high contamination concentrations, while a multilayer cap is placed over the remaining soil to prevent migration of the contaminants. This remedy will provide equivalent protection of human health and the environment and avoids risk of mobilizing contaminants into the groundwater at a fraction of the cost.

Proper application of the EPA remedial action selection criteria supports the PRP Group's proposed remedy as the appropriate remedy for the Site. We believe the PRAP underestimates the effectiveness and permanence achievable by an in-situ remedy. Excavation and off-site disposal does not reduce the toxicity or volume of contaminated soil; it merely relocates it. Any mobility concerns are fully addressed by the PRP Group's proposed remedy which will control mobility with vertical containment barriers and a contact barrier/soil cover. Also, the PRP Group's proposed remedy will be relatively straight forward to implement.

In support of this conclusion, these comments will address the following major issues of concern:

- Containment Provides Appropriate Protection
- Existing Deed Restrictions are Protective
- The PRAP Does Not Comply with EPA Guidance
- Issues that the EPA has improperly or inadequately addressed
- Corrections to the PRAP

I. The PRP Group's Proposed Remedy Fully Protects Human Health And The Environment, Satisfies All Other Appropriate Remedial Action Criteria, And Should Be Selected As The Remedy For The Site.

The appropriate remedy for the Site is the PRP Group's proposed remedy in the PRAP. It consists of a partial excavation of principal threat materials areas, a multilayer soil/synthetic cap over remaining areas, and the implementation and enforcement of institutional controls to further ensure that exposure to subsurface contamination is prevented. These controls include deed and land use restrictions for the future use of the property.

A fundamental premise of any remedial evaluation process is that the selected remedy be protective of human health and the environment. The PRP Group's proposed remedy will eliminate human exposure pathways, will protect the water quality of the area, and fully satisfy all remedial action selection criteria.

The evaluation of potential site-specific risks in the PRAP and Risk Assessment does not adhere to the EPA policies for characterizing risk. In the Elements to Consider when Drafting EPA Risk Characterizations (EPA, 1995, Office of the Administrator, Washington, DC) the following risk characterization principle is stated:

> *Risk assessments should be transparent, in that conclusions drawn from the science are identified separately from policy judgments, and the use of default values or methods and the use of assumptions in the risk assessment are clearly articulated.*

Sections III.A and III.C.4 of the Guidance for Risk Characterization (EPA, 1995, Office of the Administrator, Washington, DC) provide the following additional guidance:

> *It is essential that presenters not only communicate the results of assessment by addressing each of the descriptors where appropriate, but that they also communicate their confidence that these results portray a reasonable picture of the actual or projected exposures. This task will usually be accomplished by frankly commenting on the key assumptions and parameters that have the greatest impact on the results, the basis or rationale for choosing these assumptions/parameters, and the consequences of choosing other assumptions.*
>
> *Answering these "What if..." questions involves a calculation of risk based on specific combinations of factors postulated within the assessment. The answers to these "What if..." questions do not, by themselves, give information about how likely the combination of values might be in the actual population or about how many (if any) persons might be subjected to the potential future risk. However, information on the likelihood of the postulated scenario would also be desirable to include in the assessment.*

In preparing the TCB PRAP, the Agency has not adopted the Guidance for Risk Characterization which encourages a frank discussion of key exposure assumptions and policy considerations, and which would include the following site-specific issues:

- Residential development of the North Area is assumed despite the lack of access to the parcel due to legal entrance and exit restrictions associated with I-88.
- Residential development of the Processing Area and other parcels is assumed, despite the enforceable legal restrictions imposed by the Grant of Easement and Declaration of Restrictive Covenants filed against the property in Broome County on November 22, 1996.
- It is assumed that future residents will use the till aquifer as a potable water supply, despite the fact that all nearby residents use the underlying bedrock aquifer to ensure adequate quality and daily flow.
- Considerable bioconcentration of PCBs and chlordanes into vegetables is assumed, ignoring the site-specific data that clearly demonstrates the otherwise minimal accumulation of these chemicals into plants.

The PRPs understand the superfund risk assessment policies that promote the use of conservative default exposure assumptions. However, the EPA Risk Characterization Policy also requires risk assessments to present a candid evaluation of the effect of default exposure assumptions on the numerical risk estimates. The PRAP and the Risk Assessment do not provide such candid discussions.

II. The EPA should consider future land use based on current and future institutional controls and not the current zoning requirements.

A. Reasonably Anticipated Future Land Use

EPA has been criticized severely in the past for assuming that future land use will be residential (EPA Memorandum dated May 25, 1995 – Future Land Use in the CERCLA Remedy Selection Process). The memorandum lists various factors that should be taken into consideration when choosing a preferred alternative. Specifically, both zoning and institutional controls (e.g., deed restriction) should be considered when site conditions are not conducive to complete remediation of all contaminants. In the case of Tri-Cities Barrel, EPA has placed extreme emphasis on the zoning and has ignored the existing deed restrictions that prohibit residential development. Restrictions have also been added to prohibit breaching of the cap area. No future excavation of the land will be permitted. Residential (current or future) development is not a realistic option because all site groundwater use is prohibited by the deed restriction and the PRPs are unlikely to allow lifting of this prohibition.

For the capping alternative, the long-term risks associated with hypothetical future residents are unlikely to be realized. Future residential use is not a reasonable assumption for this site. For these risks to be realized, a series of unlikely circumstances would have to unfold. First, a builder would have to purchase a superfund site, upon which a substantial group of responsible parties controls the limited use. Next, they would have to install a well in the unconsolidated zone which does not produce sufficient water for any practical use, certainly insufficient for any potable use, and most importantly, is prohibited by the deed restriction. Finally, the water would have to be consumed for a continued duration. Alternately, and equally unlikely, a future resident would have to excavate through the cap (which is also prohibited by the deed restriction) and ingest significant soil quantities over a continued duration. Reasonable future use assumptions should be taken into consideration and, we assert, future residential use is not reasonable for this site. In addition, if the capping alternative was implemented, 75 percent of site would be returned to EPA's reasonably acceptable future land use, thereby satisfying EPA's remedial action objectives "over as much of the site as possible" (OSWER 9355.7-04).

The Risk Assessment and the PRAP assert that future residential use of the Site can occur; however, a permanent deed restriction prevents future residential development of the Site. Regardless of the current residential/agricultural zoning, the legal restrictions on the property title ensure that the Site is not and will not be available for residential use.

In the PRAP and Risk Assessment, future development and use of the area North of I-88 is assumed to be feasible. However, the northern portion of the Site is an isolated parcel that cannot be developed due to lack of access. There is no motorized access to the North: 1) access from I-88 is

legally restricted, 2) future road development to the northern portion is prevented by the steep topography east and west of the Site, and 3) access from the North is restricted by the Osborne Creek valley. Therefore, the northern portion cannot be developed, and it is wrong to assume that human receptors can be frequently exposed to environmental media North of I-88.

B. Zoning

During the public hearing, EPA acknowledged that a key component in their selection of a preferred remedy is that the property is zoned for unrestricted residential or agricultural use. Our understanding is that EPA would find the PRP Group's proposed remedy acceptable but for the zoning issue. We believe that EPA is over-emphasizing the importance of zoning, selectively to this site, and has not adequately considered that the deed restriction currently in place already provides the necessary levels of protection. We believe also, that because the PRPs are parties to the deed restriction, and because they are willing to become owners of the property, that it is even more effective than zoning in controlling future use. In fact, based on the history of this particular site, zoning has already proven ineffective in controlling how the property can be used.

Information on the use of institutional controls in Region II is sparse. As EPA guidance suggests, Records of Decision frequently fail to specify what types of controls will be used and how they will be applied at the site.

A survey of the use of institutional controls in Region II based on recent RODs drawn from the September 1999 EPA SPIS database reveals how frequently certain kinds of institutional controls have been used:

Type of Restriction	RODs
• deed or lease restrictions, covenant	13
• groundwater use restrictions	9
• fences and signs	3
• local regulations and ordinances	3
• state land use restrictions	3
• zoning	2
• deed notices	1
• owner to manage land to limit access	1

A closer analysis of RODs at Region II sites shows that the Agency has generally applied three institutional controls at sites where excavation has proven impractical or unnecessary: (1) fencing, (2) deed restrictions, zoning, or other controls on land use to prevent interference with a cap remedy, and (3) prohibitions on the use of groundwater at the site. These sites include:

- Burnt Fly Bog, New Jersey: A former landfill, where excavation of contaminated soils would disturb an ecologically important wetland. Institutional controls applied: **security fencing, deed notice "to control future use."**

- Malta Rocket Fuel Area, New York: Transformers containing PCBs were present at the site and there was PCB contamination in the soils. Institutional controls may include: **deed restrictions to limit the land to its current commercial/industrial land use.**

- Plattsburgh Air Force Base, New York: A landfill using the EPA presumptive remedy. Institutional controls unspecified, but including: **deed restrictions to prevent deterioration of the cap or use of the site's groundwater.**

- Jones Sanitation, New York: A former landfill. Institutional controls applied include **deed restrictions to limit access to and interference with the cap, and to prevent the use of groundwater.**

- Richardson Hill Road Landfill, New York: A former landfill. Remedy includes excavation of contaminated soils, with disposal of soils with lower levels of contamination on site. Institutional controls applied: **well and future use restrictions.**

- Rosen Brothers, New York: Remedy includes excavation of "hot spots," and consolidation and disposal of soils containing low levels of contaminants on site. Institutional controls applied: **fencing, deed restrictions, contractual agreements, well restrictions, and restrictions on future excavation at the site.**

- York Oil, New York: Former oil processor site. Remedy includes excavating contaminated sediments, and then stabilizing the sediments on site with other soils. Institutional controls applied: **restriction on installation and use of groundwater wells.**

- Forest Glen Subdivision, New York: Revised ROD switched from excavation remedy to cap. EPA and local government influenced by concrete plan to redevelop the site. Institutional controls applied: **zoning of site changed from residential to commercial/light industrial.**

- Hertel Landfill, New York: Zoned for residential use. Selected remedy included, but is not limited to, capping, installation of gas monitoring vents, development and implementation of on-site groundwater extraction and treatment system. Institutional controls applied: **deed restrictions.**

- 102nd Street Landfill Site, New York: Bordered by residentially zoned parcels. Selected remedy included consolidating and capping on-site and off-site soils and sediments, erecting a slurry wall, installing a groundwater recovery and treatment system. Institutional controls applied: **access restrictions and deed restrictions.**

- Warwick Landfill, New York: Selected remedy included capping, development of landfill gas vents and monitoring, residential well monitoring, provisional point-of-use treatment system, to local residential wells. Institutional controls applied: **deed restrictions.**

- General Electric/Shepard Farm National Priorities List Site, North Carolina: Three subsites, one of which still maintains the owner's residence as well as a 22-acre development with 125 home lots; lots are restricted to adults only. Selected remedy for one portion of the site was multi-layered cap. Institutional controls applied: **deed restrictions.**

It is well settled that restrictive covenants are enforceable and run with the land. Purchasers of property are held to the restrictive covenants when they have notice of their existence before purchasing the property. The restrictive covenants on the Tri-Cities Barrel property were filed. The restrictive covenants alone are binding as any subsequent purchaser would have notice of them and they are enforceable.

Based on the preceding analysis, the PRPs assert that there is substantial precedent and since the EPA's concerns regarding the future use of the property are fully addressed through existing covenants, there is no added benefit to relying on the zoning designation.

III. The PRAP Misapplies EPA's Remedial Action Regulations And Guidance.

The EPA has set forth guidance and remedial action regulations as to what factors should be taken into consideration when determining the proper course of remedial action. In addition to the future land use and zoning considerations that where mentioned above, there are several additional factors.

A. Technical Assistance Guidance Manual 4046

The New York State Department of Environmental Conservation Technical Assistance Guidance Manual (NYSDEC TAGM) 4046 Determination of Soil Cleanup Objectives and Soil Cleanup Levels criteria are inappropriate as soil cleanup objectives for the site. The NYSDEC TAGM document was issued in January 1994, and as such, contains the following technical inadequacies.

- The 1994 TAGM 4046 criteria reflect outdated risk assessment methodology and exposure assumptions that have since been revised by the EPA Office of Solid Waste and Emergency Response [e.g., the 1997 Updated Exposure Factors Handbook (EPA/600/P-95/002F), the 1999 Supplemental Guidance for Dermal Risk Assessment (EPA/540/R-99/005), and the 1996 Soil Screening Guidance: Technical Background Document (EPA/540/R-95/128)].

- TAGM Criteria developed in 1994 use outdated toxicological criteria that have since been revised by the EPA's Office of Research and

Development as a result of ongoing research (e.g., toxicological criteria for PCBs, PAHs, chlordane, beryllium, chromium, manganese, and mercury have been revised).

- Based on discussions with risk assessment personnel in NYSDEC, the PRPs understand that TAGM outlines a process to be used as a starting point for the Feasibility Study - TAGM criteria were not intended to be used as final cleanup numbers for soil.

- The TAGM document currently is undergoing revision, and the PRPs do not see the purpose of applying outdated criteria to the Tri-Cities Barrel Site.

Therefore, the EPA's adoption of the TAGM criteria for VOCs as soil cleanup objectives is arbitrary, and results in the application of bad science, especially when technically sound alternatives are available.

In our written correspondence with the EPA, the PRPs clearly stated our intent to develop risk-based preliminary remedial goals for all required constituents and environmental media. In our review of the exchange of correspondence from November 1998 through January 1999, which resulted in our preparation and submittal of revised sections of the Feasibility Study, the PRPs can find no instance where we were directed by EPA to consider the NYSDEC TAGM 4046 criteria.

The EPA Risk Assessment Guidance for Superfund (RAGS), Part B, defines Preliminary Remediation Goals (PRGs) as, "Initial clean-up goals that are (1) protective of human health and the environment and (2) comply with ARARs." Concerning the identification of ARARs, NCP regulations (Federal Register, Volume 55, No. 46, March 8 1990, page 8841), state the following with respect to State standards:

> "(4) Only those state standards that are promulgated, are identified by the state in a timely manner, and are more stringent than federal requirements may be applicable or relevant and appropriate. For purposes of identification and notification of promulgated state standards, the term "promulgated" means that the standards are of general applicability and are legally enforceable."

Based on the NCP regulations, the NYSDEC TAGM 4046 criteria should not be used to establish soil cleanup standards for VOCs: the TAGM criteria represent guidance and not promulgated regulation, and the TAGM criteria reflect outdated science. The PRPs recognized that the NYSDEC TAGM 4046 criteria needed to be considered during the development of the PRGs (and in fact this guidance document was reviewed and utilized to some extent by the PRPs to develop the Feasibility Study), but we do not agree that TAGM 4046 criteria should take precedence over current EPA policy and good science practices.

B. Short-Term Risk

The characterization of risks in the PRAP focuses exclusively on long-term risks presented to hypothetical future users of the site. The EPA has not adequately evaluated the short-term risks associated with implementation of the remedy, and therefore, does not adequately characterize the Evaluation Criterion for Short-Term Effectiveness (page 12 of the PRAP).

In the *Guidance of Conducting Remedial investigation and Feasibility Studies Under CERCLA* (EPA/540-G-89/004), the EPA states that the criterion for short-term effectiveness must consider protection of the community during remedial actions. Off-site disposal of the large volume of waste material, as proposed by the EPA, will require a considerable increase in truck traffic in the neighborhoods and roads surrounding the Site. The PRPs maintain that considerable short-term risks to the community resulting from the increased truck traffic are associated with the EPA's preferred remedial alternative. A standard method for estimating traffic risks, based on EPA's recommended remedy, is presented below:

- Approximately 5,500 trips by truck may be required to transport the waste materials to the disposal facility in Belleville, Michigan (The Environmental Quality Company treatment and disposal facility).
- The round-trip distance from the Site to the Belleville facility is 1,028 miles.
- The cumulative vehicle miles traveled by the trucks hauling waste is 5.7 million miles.
- The large truck accident rates compiled by the National Highway Traffic Safety Administration for reporting year 1997 (the most recent available data) are the following:
  - 2.6 fatal crashes per 100 million vehicle miles traveled (VMT)
  - 50 injury crashes per 100 million VMT
  - 176 property damage crashes per 100 million VMT

Using the above rates, the estimated number of truck accidents associated with off-site disposal of waste material from the Site would be:

- 0.2 fatal crashes
- 3 injury crashes
- 10 property damage crashes

The above-mentioned truck traffic analysis offers information that shows that injuries and property damages statistically will occur if the EPA-preferred remedy is implemented. The long-term risks associated with residential use of the Site is a highly unlikely scenario taking into consideration the protection offered by the engineering controls of the cap and institutional controls already in place.

The EPA has not provided an evaluation of the tradeoff between the likely short-term risks associated with the preferred remedy, and the hypothetical long-term risks associated with residential use of the Site (a use that is forbidden by the deed restriction). On that basis, the EPA has not followed its own guidance (page 12 of the PRAP) to properly characterize the nine evaluation criteria for each of the remedial alternatives.

The *Guidance for Conducting Remedial Investigation and Feasibility Studies Under CERCLA* (EPA/540-G-89/004) also states that the evaluation criterion for short-term effectiveness must consider protection of workers during remedial actions. Occupational risks associated with alternative hazardous waste site remediation methods can be quantified and given the same scientific evaluation as long-term health risks to hypothetical residents. This evaluation of short-term risks was not conducted by the EPA.

In the Journal of Occupational and Environmental Medicine (JOMA, May 1999, Volume 41, Number 5, pages 331-348), Leigh and Hoskins determine the disabling injuries of workers conducting excavation and landfilling work is about 10 times higher than the worker injuries associated with capping a site. Leigh and Hoskins demonstrate that a default site excavation and landfilling scenario is associated with 23 disabling injuries (as defined by the Bureau of Labor Statistics), but the default site capping scenario is predicted to have only 2 disabling injuries.

The evaluation of remedial alternatives by the EPA did not characterize the potential short-term risks to workers associated with the preferred remedial alternative. However, the study by Leigh and Hoskins in the May 1999 issue of JOMA indicates that substantial disparities in risks to workers are associated with the various alternatives. The remedy preferred by the EPA presents the most short-term risks to remedial workers. The PRAP fails to characterize the disparity in short-term risks associated with the remedial alternatives

C. Superfund Program Expectations (40 CFR 300.430(a)(1)(iii)(A-F))

EPA generally shall consider the following expectations in developing appropriate remedial alternatives:

- EPA expects to use treatment to address the principal threats posed by a site, wherever practicable. The PRP Group's proposed remedy achieves this expectation through the "hot spot" removal efforts.

- EPA expects to use engineering controls, such as containment, for waste that poses a relatively low long-term threat or where treatment is impracticable. The cap proposed for the PRP Group's proposed remedy achieves this expectation.

- EPA expects to use a combination of methods, as appropriate, to achieve protection of human health and the environment. The PRP Group's proposed remedy uses both containment and removal methods.

- EPA expects to use institutional controls, such as water use and deed restrictions, to supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants and contaminants. The PRP Group's proposed remedy incorporates a deed restriction to supplement the cap performance and to prevent groundwater usage.

- EPA expects to consider using innovative technology when such technology offers the potential for comparable or superior treatment performance or implementability, fewer or lesser adverse impacts than other available approaches, or lower costs for similar levels of performance than demonstrated technologies. Innovative technologies have been screened and eliminated based on the inability to offer superior treatment performance relative to demonstrated technologies.

- EPA expects to return usable groundwaters to their beneficial uses, whenever practicable, within a time frame that is reasonable given the particular circumstances of the site. The PRP Group's proposed remedy incorporates the same groundwater remedy as EPA's preferred alternative. Therefore, groundwater will be restored within similar time frames because the multi-layered cap will prevent migration from above the saturated zone, and because residuals below the saturated zone are otherwise the same.

D. Bases for ARAR Waivers

Local zoning has been identified in an addendum to the FS. In addition, EPA has not included a basis for including zoning in the ARAR. However, CERCLA authorizes the waiver of an ARAR with respect to a remedial alternative if any one of the six bases exist:

- The alternative is an interim measure that will become part of a total remedial action that will attain the ARAR.

- Compliance with the requirement will result in greater risk to health and the environment than other alternatives.

- Compliance with the requirement is technically impracticable from an engineering perspective.

- The alternative will attain a standard of performance that is equivalent to that required under the otherwise applicable standard, requirement, or limitation through use of another method.

- With respect to a state requirement, the state has not consistently applied, or demonstrated the intention to consistently apply, the promulgated

requirement in similar circumstances at other remedial actions within the state.

- For Fund-financed response actions only, an alternative that attains the ARAR will not provide a balance between the need for protection of human health and the environment at the site and the availability of Fund moneys to respond to other sites.

For the Tri-Cities Barrel Site, the PRPs believe that at least two of these waiver bases apply. First, "compliance with ARARs will result in higher risk to human health and the environment than alternative options." Second, the selected remedial action will provide an equivalent standard of performance.

To the first applicable waiver basis, excavation of site soils will significantly increase the potential exposure (or risk) to workers as well as the surrounding populace relative to leaving the impacted media in place (see Comment No. III B of this letter). Excavation will assuredly increase the potential risks. Risks posed by leaving the soil in place and capping reduces the baseline risks and the potential future risks may never occur for the following reasons:

- The soil would be covered with a multi-layer cap which eliminates direct contact and minimizes surface water infiltration through site soil and into the groundwater.

- A deed restriction is currently in place that legally eliminates future disturbance of a capping system and prohibits use of site groundwater.

Thus, the PRPs believe that this criterion for waiving compliance with the local zoning ARAR is met by implementing a capping alternative as opposed to a soil excavation alternative. Concerning the second applicable waiver basis, all remedial alternatives that were developed in the FS will provide an equivalent standard performance in that there will be no unacceptable human health or ecological risks.

E. Cost

CERCLA established five principal requirements for the selection of remedies. One of those requirements is that the remedy be cost-effective. EPA's preferred remedy identified in the PRAP is clearly not a cost-effective remedy for this site. The following information summarizes the EPA fact sheet "Role of Cost in the Superfund Remedy Selection Process" (EPA 540/F-96/018).

The NCP states that the overall goal of the remedy selection process is "to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste" *(40 CFR 300.430(a)(1)(i))*. This goal reflects CERCLA's emphasis on treatment as the preferred method of protection. However, recognizing that CERCLA tempers its emphasis on permanent solutions and treatment through the addition of the qualifier "to the maximum extent practicable," and also contains the co-equal mandate for remedies to be cost-effective, the NCP goes on to state that, in general, "EPA expects to use treatment to address the principal threats posed

by a site wherever practicable. Principal threats for which treatment is most likely to be appropriate include liquids, areas contaminated with high concentrations of toxic compounds, and highly mobile materials" *(40 CFR 300.430(a)(1)(iii)(A))* (see *"A Guide to Principal Threat and Low Level Threat Wastes," Publication 9380.3-06FS, November 1991).*

At the same time, "EPA expects to use engineering controls, such as containment, for waste that poses a relatively low long-term threat or where treatment is impracticable," and to combine these methods and use of institutional controls, as appropriate, at sites with both types of contaminated materials *(40 CFR 300.430(a)(1)(iii)(B) and (C)).*

In addition, "EPA expects to use institutional controls such as water use and deed restrictions to supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants . . . The use of institutional controls shall not substitute for active response measures (e.g., treatment and/or containment of source material, restoration of ground waters to their beneficial uses) as the sole remedy unless such active measures are determined not to be practicable, based on the balancing of trade-offs among alternatives that is conducted during the selection of remedy" *(40 CFR 300.430(a)(1)(iii)(D)).*

The Superfund Program recognizes that different waste management approaches (i.e., combinations of treatment, containment, and institutional controls) may be appropriate at different sites depending on the types of threats posed, reflecting a "built-in" sensitivity issue of cost in the superfund remedy selection process (e.g., large sums of money should not be spent treating low-level threat wastes). Cost is a critical factor in the process of identifying a preferred remedy. In fact, CERCLA and the NCP require that every remedy selected must be cost-effective.

In this context, the EPA has proposed to select a remedy estimated at approximately $20 million, while an option remains for a viable alternative for half the cost. The PRP Group's proposed remedy includes an off-site disposal to address the principal threats, engineering controls for more impractical materials, is balanced by institutional controls, and is more cost effective than EPA's preferred remedy.

In addition, the National Remedy Review Board, who's goals are to encourage cost-effectiveness and consistency in remediation sites, is required to review all proposed cleanup decisions that are over $10 million, when this amount is 50% greater than the least costly, protective cleanup alternative. This review is expected to take place early in the remedy selection process, prior to the EPA releasing a proposed plan for public comment. For the Tri-Cities Barrel property, the EPA did not submit its suggested remedy to the National Remedy Review Board, even though it is over $10 million and the amount is 50% greater than the least costly protective alternative.

IV. Issues that the EPA has improperly or inadequately addressed.

A. "Hot Spot" Volume

The PRAP indicates that implementation of the PRP Group's proposed remedy may remove approximately 16 percent of the impacted site soils. The PRAP uses this information as a reason why

the PRP Group's proposed remedy alternative would only marginally meet CERCLA's preference for treatment. However, the "hot spot" removal efforts would remove over 40 percent of the mass of contaminants based on existing data. Removing 40 percent of the mass of contaminants substantially meets CERCLA's preference. Removing the soils/sediments with the highest concentrations substantially reduces the toxicity of the remaining soils and reduces mobility by making less material available to be mobilized. This information should be included in the PRAP, and EPA should reconsider its rejection of the PRP Group's proposed remedy alternative based on misleading information.

In addition, the PRPs believe that EPA's position on what represents the "hot spot" volume is entirely inconsistent with previous agreements. Please refer to the July 1999 progress report. The "hot spot" volume, as previously agreed to, consists of the former Lagoon 1 only, which represents the source of the groundwater contamination at the site. In the Remedial Alternatives Development Report (dated March 4, 1999), the PRPs proposed that the Former Lagoon 1 area be excavated as the "hot spot" volume of soil. Both the alternative and the anticipated volume were accepted by the EPA in a comment letter dated April 1, 1999 (see specific comments 1 and 36).

B. Contingency Plan

Waste stream characterization samples will be collected from soil destined for off-site disposal as part of the preferred remedy. If deemed hazardous through characteristic testing, disposal costs vary widely based on the constituent causing the soil to be hazardous and the concentration of polychlorinated biphenyls (PCBs) and other potential underlying constituents. Depending on the results of the analysis, the soils may require incineration, which would make the EPA-preferred remedy cost prohibitive. In addition, during execution of the preferred remedy, it may become evident that cleanup goals cannot be met without significantly increasing the volume of soils for off-site disposal. This could add substantially to the already high cost of EPA's preferred remedy. In addition, the EPA must make it clear that the excavation will not extend below the water table to satisfy cleanup objectives. Excavating below that saturated zone will make the remedy cost-prohibitive and impossible to accurately quantify removal volumes.

Issues such as this have been discussed with EPA at various times throughout the time period devoted to preparing the feasibility study. EPA continued to reassure the PRPs that if something like this would become evident, then an alternative affordable remedy would be accepted and implemented at that time. This contingency needs to be built into the PRAP and subsequent Record of Decision (ROD) to provide relief for what we view as a reasonably anticipated circumstance.

C. Containment

The PRAP indicates that the PRP Group's proposed remedy would only marginally satisfy the statutory preference of CERCLA to use a permanent solution and alternative treatment technology to the maximum extent practicable. Furthermore, the PRAP indicates that containment of the contamination would be a permanent remedial solution for only a small fraction of the contaminated soils/sediments.

In its analysis, EPA appears to have failed to consider the following regarding the PRP Group's proposed remedy:

- Sediments will be removed from the tributaries in the same fashion as EPA's preferred alternative; a permanent solution.
- Known source materials of groundwater contamination will be removed from the site; a permanent solution to the principal threat.
- Over 75 percent of the site will be remediated the same as EPA's preferred alternative; a permanent solution.
- The remaining 25 percent of the site will be capped with a barrier to prevent direct exposure to and minimize, if not eliminate, migration of low-level threats; a permanent solution to minimize future impacts to human health and the environment.
- EPA has approved and implemented containment options at many sites, including those far more contaminated, and at toxic landfills without liners; EPA has described engineered caps as permanent structures that prevent direct exposure of human and ecosystem populations and prevents contamination of groundwater; by its own admission contaminant is a permanent solution.
- An existing permanent deed restriction prevents disturbance of any cap installed at the site; an institutional control to ensure the permanence of the remedy.
- Because low-level threats remain on-site, CERCLA requires that the remedy be reviewed every 5 years; another institutional control to ensure the permanence of the remedy.

EPA's failure to consider the merits of the PRP Group's proposed remedy lead to the erroneous statements in the PRAP. The PRP Group's proposed remedy substantially satisfies the statutory preference of CERCLA for a permanent solution for all of the contaminated soils/sediments. The PRAP should be modified and further consideration given to the PRP Group's proposed remedy.

D. Improper Site Area Segregation

The PRAP divides the Site into three areas: North of I-88, South of I-88, and South of Osborne Hollow Road. Grouping the monitoring data into these overly broad group areas does not effectively discern the operating areas of the Site most affected by former releases (e.g., the former lagoon area) and extends the risks over a larger area than is applicable. This methodology makes it difficult to separate trivial risks from risks that should be considered for remediation.

The PRAP (page 8) misleadingly indicates that the entire area South of I-88 presents risks to human health. The Risk Assessment combined the soil exposure concentrations for the area South of I-88 from the former lagoon, drum processing, former drum storage, barrel burner, and process building areas. The wide range of detected concentrations specific to each area shows it was inappropriate to combine these data subsets. Discussion of specific operational areas of the Site in the PRAP and Risk Assessment would have aided evaluating the potential scope of remediation.

The PRAP (page 8) misleadingly indicates that the entire North of I-88 area presents hypothetical risks to human health. The Risk Assessment derived soil exposure point concentrations for the area North of I-88 by combining data from all of the soil sample locations north of the freeway. This data grouping ignores the obvious trend that soil contaminants are localized around the man-made pond, and the rest of the northern area is relatively uncontaminated.

E. Assumed Risks Associated with Groundwater

The horizontal extent of groundwater contamination and the actual potential for exposure to groundwater is not accurately depicted in the Risk Assessment and the PRAP. The PRAP (page 6) states that affected groundwater at the Site is restricted to the area South of I-88; however, page 8 of the PRAP states that the area North of I-88 presents risks from ingestion of overburden groundwater.

- The cause of these contradictory statements is the assumption in the Risk Assessment that monitoring wells in the area South of I-88 (MW-2, MW-3, and MW-5) were representative of groundwater conditions for North of I-88.

- However, groundwater data from the MW-6 and MW-7 monitoring wells located north of I-88 showed no exceedances of primary drinking water criteria.

- For example, the Risk Assessment estimates that future residents in the area North of I-88 will ingest 11 mg/l of vinyl chloride in groundwater; however, vinyl chloride was never detected in any of the groundwater samples collected from the area North of I-88.

Therefore, the Risk Assessment and the PRAP do not accurately evaluate potential risks from groundwater ingestion in the area North of I-88.

Vertical groundwater contamination and the actual potential for groundwater exposure is overestimated in the Risk Assessment and PRAP. The existing residential wells in the surrounding neighborhood are installed in bedrock, but potential risks are based on ingestion of the shallow glacial till groundwater.

- Assessing the groundwater exposure pathway using the bedrock aquifer as the source of potable water would have indicated negligible risks for

all receptors, but this critical information was omitted from the Risk Assessment and Proposed Plan.

- The on-site monitoring wells in the shallow till were bailed dry during sampling, indicating there is insufficient flow in the till to support a shallow domestic supply well on the site.

- The glacial till effectively restricts the vertical transport of groundwater contamination. A comparison of the groundwater data from the shallow till and deep till wells at locations MW-2 and MW-3 shows that vertical transport is negligible (e.g., 1,1-dichloroethane was detected at 380 ug/l in the shallow till well (MW-2S) and 7 ug/l in the deeper till well at MW-2D. Furthermore, site contaminants were not detected in the bedrock monitoring wells.

By omitting exposure and risk information specific to the bedrock aquifer, the EPA fails to present a balanced evaluation of potential site risks from ingestion of groundwater.

F. Assumed Risk Associated with Gardening

Potential risks from gardening were overestimated because the Risk Assessment used models that ignored the site-specific plant sampling data presented in the Remedial Investigation (RI). Very few compounds were detected in samples of leafy plants collected during the RI, yet the risk assessment predicts accumulation in vegetables of most of the chemicals of potential concern. The risk assessment used default bioconcentration factors and did not calibrate the exposure model against the site-specific plant monitoring data. As a result, the potential risks from the gardening exposure pathway are not representative of the actual site conditions.

The vegetable exposure point concentrations for PCB congeners and chlordane isomers (which account for 75 percent of the total gardening pathway risks) were estimated using a bioconcentration factor for leafy vegetables of 1.9. This bioconcentration factor predicts that the concentrations of PCBs and chlordane in leafy plants will be almost double the concentrations in soil. However, the site-specific monitoring data for leafy plants and surface soil shows that the concentrations of PCBs and chlordanes in plants is orders of magnitude lower than the detected concentrations in soil.

- For example, plant sample ESP-4 was collected from the location of SED-13 and SED-17.

- SED-13 and SED-17 contained an average of 9,000 ug/kg of total PCBs in soil.

- The bioconcentration factor of 1.9 used in the risk assessment predicts that plant tissue in ESP-4 should have contained 17,000 ug/kg of PCBs (9,000 x 1.9).

- However, plant sample ESP-4 contained only 160 ug/kg, a discrepancy of two orders of magnitude.

- The site-specific data from samples ESP-4 and SED-13/SED-17 demonstrate that the bioconcentration factor for PCBs and chlordanes should actually be 0.018, two orders of magnitude lower than the bioconcentration factor of 1.9 used in the risk assessment.

By failing to consider the site-specific data for leafy plants, the Risk Assessment and PRAP Grossly overestimate potential risks from the gardening pathway.

V. Corrections to PRAP

In addition to the comments and concerns expressed above, there are several specific corrections to address:

- Page 4 - First paragraph, the pond has been described to cover the greatest amount of land surface North of I-88. This is incorrect. The pond is less than 0.2 acres. The parcel of land North of I-88 is 5.2 acres.

- Page 8 - Second paragraph, ingestion of overburden groundwater has been identified as an unacceptable risk. However, groundwater is not impacted North of I-88. This statement must be deleted from the PRAP.

- Page 11 - Second column, first paragraph, the text states that once the treated material satisfies TAGM objectives, it would be tested in accordance with the Toxicity Characteristic Leaching Procedure (TCLP). If the material satisfies TAGM objectives, how could it possibly fail TCLP criteria? This section needs to be reworked.

- Page 13 - Last paragraph, the text states that the groundwater contamination at the Site itself presents very high human health cancer risks for future on-site residences and visitors if not treated. The current Deed Restriction eliminates the exposure pathway for site groundwater. Therefore, there is no current or future risk associated with site groundwater. This discussion pertaining to groundwater risks should be reworded to describe the risks before the Deed Restriction was put in place or deleted entirely.

CONCLUSION

The PRPs are extremely reluctant to proceed with the EPA-preferred remedy. The PRPs strongly believe that the "hot spot" removal and capping alternative (the PRP Group's proposed remedy in the PRAP) is most appropriate for this Site as summarized by the following:

- Reasonable likely use is not residential.

- Obtaining ownership and maintaining the deed restriction is more protective than zoning.
- The principal threat and source materials will be removed.
- The PRP-preferred remedy addresses over 75 percent of the site area in the same manner as the EPA-preferred remedy.
- The multilayer cap is a permanent solution to low level threats that would remain on less than 25 percent of the site area.
- The EPA has made an improper assessment of long-term risks in choosing a remedy.
- The EPA has totally disregarded the short-term risks in choosing a remedy.

Sincerely,

David L. Cook/do

David L. Cook
Liaison Counsel to the Tri-Cities Barrel Superfund Site
Cooperating Parties Group

APPENDIX V-b

PRP GROUP'S LETTER OF MARCH 8, 2000 RELATED TO A REMEDY REVIEW BY THE NATIONAL REMEDY REVIEW BOARD AND EPA'S MARCH 23, 2000 RESPONSE

NIXON PEABODY LLP
ATTORNEYS AT LAW
Clinton Square
Post Office Box 1051
Rochester, New York 14603-1051
(716) 263-1000
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E-Mail: dcook@nixonpeabody.com

March 08, 2000

Ms. Young Chang
New York/Caribbean Superfund Branch I
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007

RE: Tri-Cities Barrel Superfund Site, Fenton, New York

Dear Ms. Chang:

On behalf of the Tri-Cities Barrel PRP Group, this letter requests that the EPA Region II submit its proposed remedy for the Tri-Cities Barrel Superfund Site to the National Remedy Review Board (NRRB) for review. As you know, the establishment of the NRRB was to help control costs and promote consistent and cost-effective decisions at Superfund sites. The NRRB was one of the administrative reforms implemented by the Administrator of the EPA in response to Congressional criticism of the agency's handling of the Superfund program.

Review by the NRRB is triggered when (1) the proposed remedy cost is more than $30 million; or (2) the proposed remedy costs more than $10 million and is 50% greater than the least costly protective cleanup alternative that also complies with ARAR's for the site. According to EPA policy, the NRRB should review sites early in the remedy selection process, before the Region releases the proposed plan for public comment.

The Tri-Cities Barrel Site clearly falls under the second category that warrants review. The EPA's proposed remedy would cost approximately $16.8 million and the PRP Group's proposed remedy would cost approximately $6.8 million. The PRP Group's proposed remedy is also a protective cleanup alternative that complies with necessary ARAR's.

The Tri-Cities Barrel Site is situated approximately five miles northeast of the City of Binghamton, in the Town of Fenton, Broome County, New York. The property is currently zoned residential/agricultural, as such the prior industrial use of the property was a

nonconforming use. The property owners were permitted to continue operating a drum reclamation facility after a zoning ordinance prohibited such use.

In the proposed plan for the Site, the Agency listed four remedial alternatives. The two at issue are Alternative SS-2 and Alternative SS-3. Alternative SS-2, the PRP Group's proposed remedy, consists of excavation and on-site disposal of contaminated soil/sediments, excavation and off-site treatment/disposal of principal threat waste areas, and installation of a multi-layer cap. This alternative will cost approximately $6.8 million. Alternative SS-3, the Agency's proposed remedy, consists of excavation of all contaminated soils/sediments and on-site incineration and disposal. This alternative will cost approximately $16.8 million. Based on these numbers and the fact that both alternatives are viable, protective remedial alternatives, the Tri-Cities Barrel Site is required to go before the NRRB for review.

It is our understanding that the reason the Tri-Cities Barrel Site was not submitted to the NRRB for review prior to the issuance of the PRAP, was that the PRP Group's proposed remedy was viewed by the Agency to be precluded by the residential zoning of the property. The property currently has restrictive covenants prohibiting future residential use of the property. Therefore, the Region II position completely contradicts the purpose of the NRRB. The NRRB is designed to look at different feasible alternatives in Superfund site remediation. One alternative at this, and many other sites, is to implement institutional controls such as restrictive covenants on future property use. Prohibiting residential use of property is consistent with EPA policy and one that is often suggested by the NRRB. In this instance, Region II has imposed it's own judgment in place of the NRRB. With the restrictive covenants already in place, future residential use is not a reasonably forseeable use of the Site.

In the past, the EPA has accepted land use restrictions as part of an adequate remedy for numerous Superfund sites. In fact, some of those sites also went before the NRRB. The NRRB has encouraged land use restrictions as part of an adequate remedial measure.

Region II recently had a very similar case go before the NRRB. On May 3, 1999, the NRRB issued its recommendations for the Li Tungsten/Captain's Cove Superfund Site in Glen Cove, NY. There, the NRRB criticized Region II for being overly conservative in their proposed preliminary remediation goals (PRGs) and for not fully considering other lower cost, feasible alternatives. The NRRB acknowledged that the property would not be used for residential purposes in the future and that the EPA and the State needed to take this in to consideration.

Since the monetary conditions for review have been met and other similarly situated properties have gone before the NRRB, the Tri-Cities Barrel Site is an appropriate candidate for review by the NRRB. We urge EPA Region II to reconsider its position on referring the Site to the NRRB. The Agency should allow the NRRB to do the job it was designed to do,

which is to promote cost-effectiveness and appropriate national consistency in the remedy selection at Superfund sites.

I would appreciate a prompt response to this letter, so the PRP Group can determine how to proceed with respect to this issue.

Sincerely,

David L. Cook
Liaison Counsel to the Tri-Cities Barrel
Superfund Site Cooperating Parties Group

cc: National Remedy Review Board
George Zachos, EPA Region II Ombudsman
Walter E. Mugdan, Regional Counsel
Timothy Fields, Jr., Ass't. Administrator for Solid Waste and Emergency Response

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

March 23, 2000

VIA FACSIMILE TRANSMISSION [716-263-1600]
& FIRST CLASS MAIL

Tri-Cities Barrel Superfund Site PRP Group
c/o Nixon Peabody LLP
Clinton Square
Rochester, NY 14603

Attention: David L. Cook, Esq.

Re: Tri-Cities Barrel Co., Inc. Superfund Site

Dear Mr. Cook:

I am in receipt of your letter of March 8, 2000, regarding the Tri-Cities Barrel Co., Inc. Superfund site. In your letter, you raise issues about the United States Environmental Protection Agency Region II (EPA) submitting its proposed remedy and the Potentially Responsible Party (PRP) Group's preferred remedy for the site for review by the National Remedy Review Board (NRRB).

During the weeks preceding issuance of the Proposed Plan for the site, EPA reviewed the proposed remedial alternative to determine whether NRRB review would be appropriate. According to NRRB procedures, the NRRB reviews proposed cleanup actions at sites where: (1) estimated costs for the preferred alternative are over $30 million or (2) proposed remedy costs are over $10 million and 50% greater than the costs of the least-costly, *protective*, cleanup alternative that also complies with applicable or relevant and appropriate requirements pertaining to a site (see *Formation of National Superfund Remedy Review Board*, EPA Office of Solid Waste and Emergency Response, November 28, 1995, at http://www.epa.gov/ superfund/programs/nrrb/index.htm).

EPA determined then, as it determines now, that the PRP Group's preferred remedy fails to pass the threshold National Contingency Plan criterion of being protective of human health and the environment (National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300.430(e)(9), hereinafter "NCP"). The PRP Group's proposed capping remedy is not a protective alternative, as discussed below; thus, it is not a viable alternative for consideration by the NRRB. EPA conducted a detailed analysis of the remedial alternatives pursuant to Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9621, and the NCP, 40 C.F.R. § 300.430(e)(9). The detailed analysis consisted of an assessment of the remedial alternatives against each of nine NCP evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

Pursuant to the NCP, the initial "threshold" criterion for a remedial alternative to be eligible for selection is whether it would achieve overall protection of human health and the environment. In other words, the NCP requires that each remedial alternative be first analyzed to determine whether or not it would provide adequate protection, *i.e.*, to what degree would it eliminate, reduce, or control risks posed through each exposure pathway.

Determination of Reasonably-Anticipated Future Land Use

EPA has determined that a capping remedy at this site would not achieve overall protection of human health and the environment. EPA based this decision on its determination that the reasonably-anticipated future land use of the site is residential and/or agricultural. In other words, the capping remedy proposed by the PRP Group would not adequately protect potential future site residents or consumers of crops grown on the property from the risks posed by the contamination to be left at the site under that alternative.

As discussed in greater detail in EPA's land use guidance (see *Land Use in the CERCLA Remedy Selection Process*, OSWER Directive 9355.7-04, May 25, 1995, (1995 WL 457568 OSWER)), the remedy selection process at a Superfund site involves a determination by EPA of a site's reasonably-anticipated future land use. Reasonably anticipated future use of the land at National Priorities List sites is an important consideration in determining the risk from contamination, thus the appropriate extent of remediation. The reasonably-anticipated future land use will affect the types of and frequency of exposures that may occur from any residual contamination remaining on the site, which in turn affects the nature of the remedy chosen.

The development of assumptions regarding the reasonably-anticipated future land use is based on existing information to the extent possible; much of which will be available from local land use planning authorities and from a visual inspection of a site and its surrounding area. Specific sources and types of information that aided EPA in determining the reasonably-anticipated future land use for the site include: current land use; zoning ordinances; zoning maps; comprehensive master plans for Broome County and the Town of Fenton; accessibility of the site to existing infrastructures (*e.g.*, transportation and public utilities); institutional controls currently in place; site location in relation to urban, residential, commercial, industrial, agricultural, and recreational areas; historical or recent development patterns in the vicinity of the site; potential vulnerability of groundwater to contaminants that might migrate from soil; location of on-site or nearby wetlands; and geographic and geologic information.

These and other types of information are to be considered, where appropriate, when developing the assumptions about future land use. Interaction with the public, which includes all stakeholders affected by a site, also serves to increase the certainty in the assumptions made regarding future land use at Superfund sites to increase the confidence that expectations about anticipated future land use are, in fact, reasonable. As is illustrated below, these types of information were, in fact, considered by EPA in developing its determination of the reasonably-anticipated future land use.

The master zoning plan for the area calls for residential/agricultural uses of the property. Although Tri-Cities Barrel used the property for other than residential or agricultural purposes, it did so as a non-conforming use; the Town apparently envisioned the site returning to residential and/or agricultural uses once Tri-Cities Barrel ceased operations.

As indicated by recent events, the Town has not changed its position on the zoning for the property. In response to EPA and the PRP Group's inquiries regarding the site's reasonably-anticipated future land use, the Town Board of the Town of Fenton determined in an August 1999 resolution that the current residential/agricultural zoning would not change. The Town's resolution was communicated in letters dated August 23, 1999 from Donald F. Brown, Town Engineer, Town of Fenton, to Joel Singerman of EPA, and November 2, 1999 from Mr. Brown to Jack Spicuzza, the PRP Group's technical representative. Then, in response to a presentation by the PRP Group to the Town Board in December 1999, in which the PRPs requested a "special use" exception for the site, the Town of Fenton reaffirmed the site's residential/agricultural zoning in January 2000.

EPA also determined, in accordance with the Land Use Guidance, as recently as the February 9, 2000 public meeting regarding the Proposed Plan, that the local community supports EPA's reasonably-anticipated future land-use determination.

Furthermore, as EPA has observed first-hand since its earliest involvement with the site, the property is situated in an area of residences and old farms, in keeping with its residential/agricultural designation. There are no industrial or commercial properties in the vicinity of the site. The site is accessible to Interstate 88 via an exit located approximately two miles to the west; this proximity increases the site's potential usefulness for residential purposes.

Effect of Restrictive Covenants

As the primary justification for the PRP Group's capping remedy, you rely upon the restrictive covenants regarding the site property, which purport to give the PRPs the right to control its future residential use. The Land Use Guidance directs EPA to consider "institutional controls already in place" at a site in determining the reasonably-anticipated future land use. EPA interprets the Land Use Guidance in this instance to refer to institutional controls that were placed on a property in keeping with its normal use, but not those placed on property in contemplation of a Superfund remedy. In making its remedy selection for the site, EPA read and considered the restrictive covenants that you obtained from Tri-Cities Barrel Co., Inc., via its officer, Gary Warner, and presumably recorded in the chain of title for the site property.

The NCP disfavors the use of institutional controls, stating that they "shall not substitute for active response measures . . . as the sole remedy unless such active measures are determined not to be practicable" (40 C.F.R. § 300.430(a)(1)(iii)(D)). It is questionable whether (and if so, to what extent) institutional controls, such as restrictive covenants, can act to effectively prevent the residential use of the site for the very long period, perhaps in perpetuity, during which the contaminants would remain in place under the cap as sought by the PRP Group's preferred remedy.

Since we do not think that institutional controls can necessarily prevent the residential use (or any other use) of a property forever, the site would continue to pose a risk to future residents under the capping alternative. For example, it is not at all clear in the case of restrictive covenants which parties have the rights to enforce the covenants if current or subsequent owners seek to build on or draw water from a site following remedy completion. Furthermore, the prohibitions contained in any restrictive covenant are not irrevocable. In other words, they can be modified or rescinded through subsequent declarations of restrictive covenants by the property owner, or lost through possible tax foreclosure (see, *e.g.*, New York Property Tax Law § 1020(1)). When set against the other relevant criteria listed in the Land Use Guidance for determining reasonably-anticipated future land use, the restrictive covenants are not sufficient to suggest that they alone would dictate the site's reasonably-anticipated future land use, control the actual future land use of the site, or serve to make the remedy protective. Nonetheless, we note that the restrictive covenants that the PRP Group obtained have been and will be important in providing needed access to the site. They will also be important in serving as temporary institutional controls during the course of the remedial action.

Prior to issuing the Proposed Plan for the site, EPA considered whether NRRB review of the remedial alternatives was appropriate. For the foregoing reasons, NRRB review was and continues to be deemed by EPA as not appropriate.

Please call me at 212-637-4253 or Carl Garvey, of the Office of Regional Counsel, at 212-637-3181 if you wish to discuss this letter.

Sincerely yours,

Young S. Chang
Remedial Project Manager

cc: George Zachos, EPA Region II Ombudsman

bcc: Carl Garvey, ORC
Michael Mintzer, ORC
Stuart Walker, Headquarters
John Frisco, ERRD

APPENDIX V-c

LIST OF POTENTIALLY RESPONSIBLE PARTIES

At this time, each of these parties is considered by EPA to be liable for the performance of the Site Remedial Design and Remedial Action.

1. Agway, Inc.
2. Alcan Rolled Products Company
3. AlliedSignal Inc.
4. Amphenol Corporation (Bendix)
5. Ashland Inc., Ashland Chemical Company Division
6. Azon Corporation
7. B&K Metals, Inc., successor to Oberdorfer Foundries, Inc.
8. BASF Corporation
9. BMC Industries, Inc.
10. Borden, Inc.
11. Bristol-Myers Squibb Company
12. Bronstein Container Company, Inc.
13. Cambridge Industries, Inc., successor to Voplex
14. Carrier Corporation
15. Celotex Corporation
16. Champion International Corporation, successor by merger to St. Regis Paper Company
17. Chemcoat, Inc.
18. Chrysler Corporation
19. Cooper Industries, Inc. Crouse Hinds Division
20. Crash's Auto Parts and Sales, Inc. (d.b.a. C.A.P. Surplus & Metals)
21. D&D Oil Co., Inc.
22. Drake Oil Company, Inc.
23. E.I. du Pont de Nemours & Company
24. EJ Footwear Corp.
25. Elf Atochem North America, Inc.
26. Emerson Power Transmission Corp.
27. GAF Corp.
28. Gary F. Warner (president of Tri-Cities Barrel Co., Inc.)
29. General Motors Corporation
30. General Electric Company
31. IBM Corporation
32. International Paper Company, Anitec Image Division
33. Jones Chemicals, Inc.
34. Kaplan Container Corporation
35. Malchak Salvage Company, Inc.
36. Masonite Corporation, subsidiary of International Paper Company
37. Matt Brewer Oil Co. of Elmira, New York, Inc.
38. Matt Brewer Oil Co. of Binghamton, New York, Inc.
39. N. Storonske Cooperage Co., Inc.
40. Newton Falls, Inc. f/k/a Stora Papyrus Newton Falls, Inc.
41. Northern Plastics Corporation
42. Ozalid Corporation
43. Potter Paint Co., Inc.
44. PPG Industries, Inc.
45. Rome Cable Corporation
46. Schenectady International, Inc. f/k/a Schenectady Chemicals, Inc.
47. Sonoco Flexible Packaging, Inc. d/b/a The Morill Press
48. State of New York (for the New York State Department of Transportation)
49. Tri-Cities Barrel Co., Inc.
50. Underwood Industries of New York, Inc., Viking Products Co. Division
51. Wainwright Oil Co., Inc.