RECORD OF DECISION

Pollution Abatement Services

City of Oswego, Oswego County, New York

Z38001

United States Environmental Protection Agency
Region II
New York, New York
December 1993

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Pollution Abatement Services (PAS)

City of Oswego, Oswego County, New York

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedial action to augment the previously implemented remedial action and to address contamination detected outside the containment system at the PAS site 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 to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site. The attached index (Appendix III) identifies the items that comprise the Administrative Record upon which the selection of the remedial action is based.

The New York State Department of Environmental Conservation (NYSDEC) has been consulted on the planned remedial action in accordance with CERCLA §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 selected remedial action represents the third operable unit of site remediation. The first operable unit was for removal actions taken from 1973 to 1982 by EPA and NYSDEC. The remedy for the second operable unit which addressed the on-site contaminated groundwater was specified in a ROD issued in June 1984.

The selected remedy for this operable unit will incorporate all of the existing components of the second operable unit of site remediation. These components include:

- the existing containment system (including a cover, slurry wall and leachate and groundwater collection system);
- treatment and disposal of the collected leachate and groundwater;
- site security and access control by a perimeter fence;
- site maintenance; and
- long-term monitoring.

The selected remedy will also incorporate the following additional components:

- enhancing the present source control system by optimizing the leachate and groundwater extraction rate and other operating parameters in order to achieve, to the degree practicable, inward horizontal gradients in the overburden and upward vertical gradients from the bedrock toward the containment system;
- bedrock groundwater extraction and treatment;
- connecting downgradient residents in the Smith's Beach area, who are using residential wells, to the public water supply to ensure that potential future exposure to contaminants in the bedrock groundwater does not occur; and
- recommending institutional controls on groundwater usage through deed restrictions at the PAS site and downgradient from the site to and including the Smith's Beach area.

During the remedial design, an investigation will be undertaken to better define the extent of contamination of the bedrock aquifer, to verify that the increased interim groundwater removal pumping from the overburden aquifer within the containment system has created upward vertical gradients between the bedrock and overburden aquifers, to determine the potential effectiveness of pumping to contain impacted groundwater in the bedrock outside the containment system, to evaluate the hydraulic potential to restore the bedrock aquifer's water quality, and to determine potential impacts of bedrock groundwater pumping on vertical gradients beneath the containment system and the creeks and wetlands. Should the results of this investigation determine that bedrock pumping will be an effective means of addressing the contamination in the bedrock aquifer without adversely impacting the existing containment system or the creeks and wetlands, then an analysis to determine the rate of extraction and the location of the bedrock extraction wells will be performed, followed by implementation of the bedrock groundwater extraction and treatment. Should the investigation indicate that bedrock groundwater pumping will have a significant, adverse

impact on the containment system or the creeks and wetlands, this decision will be documented in a pre-remedial design study report concurred upon by New York State[1].

The preferred option for the treatment and disposal of the leachate and groundwater is discharge to the City of Oswego's Eastside Wastewater Treatment Plant. The contingent option is construction of an on-site treatment system and discharge to White or Wine Creek or to groundwater. The current system for treatment and disposal of the leachate and groundwater via the off-site Resource Conservation and Recovery Act (RCRA) treatment, storage, and disposal (TSD) facility will continue until a final treatment option is selected and implemented.

Since there is some uncertainty related to the source of the pesticides detected in the surface water of the adjacent creeks and the PCB contamination in the sediments in the adjacent creeks and wetlands, a study will be conducted to determine the sources of pesticide and PCB contamination. If it is determined that the contamination in the adjacent creeks and wetlands is attributable to the PAS site, then these areas will be designated as a separate operable unit and a focused feasibility study will be conducted to evaluate appropriate remedial alternatives.

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1 In accordance with CERCLA Section 117(c) and Section 300.435(c)(2)(i) of the NCP, if bedrock groundwater pumping is not implemented, then an Explanation of Significant Differences, describing the modification to the selected remedy and the basis for the change, will be published.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA §121, 42 U.S.C. §9621: (1) it is protective of human health and the environment; (2) it attains 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 (ARARs) under federal and state laws, (3) it is cost-effective; (4) it utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable; and (5) it satisfies the statutory preference for remedies that employ treatment to reduce the toxicity, mobility, or volume of the hazardous substances, pollutants or contaminants at a site.

A review of the remedial action pursuant to CERCLA §121(c), 42 U.S.C. §9621(c), will be conducted five years after the commencement of the remedial action, and every five years thereafter, to ensure that the remedy continues to provide adequate protection to human health and the environment, because this remedy will result in hazardous substances remaining on-site above health-based levels.

William J. Muszynski, P.E.
Acting Regional Administrator

12/29/93
Date

RECORD OF DECISION FACT SHEET
EPA REGION II

Site:

Site name: Pollution Abatement Services (PAS)

Site location: Oswego, Oswego County, New York

HRS score: 70.80

Listed on the NPL: September 1983

Record of Decision:

Date signed: December 29, 1993

Selected remedy: Enhanced Source Control With Bedrock Groundwater Extraction and Treatment

Capital cost: $1,110,000

Construction Completion - Estimated June, 1995

O & M cost in 1994: $200,000 (1993 dollars)
O & M cost in 1995: $200,000 (1993 dollars)
O & M cost in 1996: $200,000 (1993 dollars)
O & M cost in 1997: $200,000 (1993 dollars)

Present-worth cost - $3,600,000 (7% discount rate for 30 years):

Lead:

Site is enforcement lead - EPA is the lead agency

Primary Contact: Richard Ramon, P.E., Esq., (212) 264-1336

Secondary Contact: Joel Singerman, Chief, Western New York Superfund Section I

Main PRPs: There are almost 100 PRPs, de maximus is the PRP consultant (615) 691-5052

Waste:

Waste type: metals, volatile organics, semi-volatile organics and PCBs

Waste origin: Hazardous waste

Contaminated medium: soil, ground water, and surface water

RECORD OF DECISION

DECISION SUMMARY

Pollution Abatement Services

City of Oswego, Oswego County, New York

United States Environmental Protection Agency
Region II
New York, New York
December 1993

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ATTACHMENTS

SITE NAME, LOCATION AND DESCRIPTION

The PAS site is located on 15 acres near the eastern edge of the City of Oswego, New York. The site is bounded on the south by East Seneca Street, and on the east, north, and west by wetlands formed along the stream channels of White and Wine Creeks (see Figure 1). Just to the north (downstream) of the PAS site is the confluence of White and Wine Creeks. Wine Creek flows approximately 1800 feet farther north to a wetland adjacent to the community of Smith's Beach, and then into Lake Ontario (see Figure 2). Prior to passing through the PAS site, White and Wine Creeks originate in and flow through farmland to the south. White Creek is proximate to the East Seneca Street Dump (also referred to and operated as the Oswego County Landfill) and both White and Wine Creeks flow through or are proximate to the Niagara Mohawk Fire Training School. The Oswego Castings site is upstream of the wetland adjacent to Smith's Beach.

The area between the PAS site and Lake Ontario (to the north) is mostly undeveloped and currently includes three land uses. These uses, from west to east include a cemetery, a wetland, and a residential community. The residential community, Smith's Beach, consists of approximately 25 dwellings and is located on the shore of Lake Ontario, about 1/2 mile north of the PAS site. Public water supply is available in Smith's Beach, but some residents may not be connected to that public supply.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The PAS facility, a high-temperature liquid chemical waste incineration facility, operated from 1970 through 1977. Beginning in 1973, a series of incidents, including liquid waste spills and the overflow of liquid wastes from lagoons into White Creek, led to the involvement of EPA and NYSDEC at the site. Removal actions taken from 1973 to 1982 by EPA and NYSDEC resulted in the removal of the incineration facilities, drummed wastes, bulk liquid wastes, and contaminated soils and the closure of two on-site lagoons (Operable Unit 1). In 1981, the PAS site, which was ranked number seven on the original National Priorities List, was selected as one of the first sites in the nation to receive CERCLA Trust Fund monies for cleanup actions.

From 1982 to 1984, NYSDEC's contractor performed a *Site Investigation and Remedial Alternatives Evaluation* of the PAS site which was the initial RI/FS conducted at the site. Based on the results of this study, EPA signed a ROD in 1984, which specified the following remedial actions: limited excavation and off-site disposal of contaminated materials, installation of a perimeter slurry wall, site grading and capping in accordance with RCRA requirements, installation of a leachate and groundwater collection and treatment system, and groundwater monitoring (Operable Unit 2). NYSDEC implemented the remedial actions identified in the ROD, with the exception of the on-site treatment system. Rather than install an on-site treatment system, leachate and groundwater were collected by NYSDEC from 1986 through 1991 and transported off-site to an approved RCRA treatment and disposal facility.

During the period 1984 to 1986, NYSDEC's contractor performed an environmental assessment of the area in the vicinity of the PAS site, which included White and Wine Creeks. Based on the results of the environmental assessment, NYSDEC determined that no remediation of the creeks was required. The long-term monitoring program, which commenced in 1989 by NYSDEC, includes routine monitoring of the groundwater, surface water, and sediments in the vicinity of the PAS site.

In 1987, the results of water sampling and down-hole camera investigations of the existing monitoring wells at the site indicated that contamination may exist outside the slurry wall containment system.

In September 1990, an Administrative Order on Consent (AOC) was entered into between EPA and a group of potentially responsible parties (PRPs) to conduct a supplemental RI/FS to evaluate the integrity of the existing containment system at the site, to determine the nature, extent, and source of contamination and any threat to the public health or the environment caused by the release of hazardous substances outside the containment system, and to identify and evaluate remedial alternatives.

In September 1991, EPA and a group of PRPs entered into an interim groundwater (leachate) removal AOC. This AOC requires routine removal of leachate and groundwater from within the containment system for 36 months or until 1,080,000 gallons of leachate and groundwater have been removed, whichever comes first. The extracted eachate and groundwater (approximately 15,000 gallons every two weeks) is currently transported to an approved RCRA treatment and disposal facility.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report, FS report, and the Proposed Plan for the site were released to the public for comment on August 23, 1993. These documents were made available to the public in the administrative record file at the EPA Docket Room in Region II, New York and the information repository at the Oswego City Hall. The notice of availability for the above-referenced documents was published in the *Oswego Palladium Times* on August 21, 1993. The public comment period related to these documents was held from August 24, 1993 to September 22, 1993.

On September 8, 1993, EPA and NYSDEC conducted a public meeting at Oswego City Hall to inform local officials and interested citizens about the Superfund process, to review current and planned remedial activities at the site, to discuss the Proposed Plan, to receive comments on the Proposed Plan, and to respond to questions from area residents and other interested parties.

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 primary objectives of this action are to control the source of contamination at the site, to reduce and minimize the downgradient migration of contaminants in the groundwater, and to minimize any potential future health and environmental impacts.

The first operable unit was for removal actions taken from 1973 to 1982 by EPA and NYSDEC. The remedy for the second operable unit which addressed the on-site contaminated groundwater was specified in a ROD in issued in June 1984.

This third operable unit addresses conditions not permanently resolved by previous site actions. First, this action will modify the groundwater treatment requirements called for in the 1984 ROD. Second, this action will include measures to address contamination located outside the containment system. And third, this action will convert the current interim groundwater (leachate) removal program into a permanent means of treating and disposing of leachate removed from the existing containment system.

SUMMARY OF SITE CHARACTERISTICS

The purpose of the Supplemental Remedial Investigation (SRI) was to evaluate the hydraulic integrity of the containment system and assess the nature and extent of the site-related contaminants outside the containment system.

From May 1991 through March 1992, field activities were conducted at the site. These field activities consisted of drilling soil borings, collecting soil samples, installing monitoring wells, measuring water levels, conducting a pumping test of the leachate collection system, and collecting groundwater, surface water, and sediment samples for laboratory analysis.

Hydrogeologic Evaluation of the Site and Containment System

Three hydrogeologic units are present at the site: the unconfined overburden unit consisting of man-made fill and low permeability ablation till (from surface to 15 ft.); the lower permeability lodgement till (from 15 ft. to 36 ft.); and the low permeability confined bedrock aquifer (below 36 ft.)[2]. The containment system slurry wall extends through the overburden into the top of the lodgement till.

Groundwater flow in the overburden outside of the containment system is generally to the north/northwest. It responds seasonally to variation in precipitation, and is locally influenced by changes in the surface water levels in White and Wine Creeks. Groundwater

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[2] All depths are at monitoring well SWW-1 (see Figure 1).

from the overburden outside of the containment system discharges into White and Wine Creeks, which appear to act as hydraulic barriers.

Overburden groundwater levels within the containment system are controlled by pumping from the leachate and groundwater recovery systems. Horizontal gradients within the containment system are generally to the northwest. September 1991 data indicated that the horizontal groundwater flow gradients across the slurry wall were outward along most of the eastern and northern (downgradient) sides of the slurry wall.

Based upon April 1993 data, it appears that the increased interim groundwater removal pumping under the September 1991 AOC has modified the horizontal gradients across the slurry wall resulting in inward gradients along much of the length of the slurry wall (i.e., groundwater tends to flow inward rather than outward toward the slurry wal).

The bedrock groundwater flow direction is northward, toward Lake Ontario, and the hydraulic gradient (and flow velocity) decreases with distance from Lake Ontario. In general, naturally-occurring upward hydraulic gradients from the bedrock toward the overburden deposits exist in the vicinity of White and Wine Creeks adjacent to the site, and downward vertical gradients exist in the remaining areas. Based on April 1993 data, it appears that upward vertical gradients between the bedrock and overburden may have been produced over part of the containment system. These upward gradients are believed to be due to increased interim groundwater removal pumping from the overburden within the containment system.

The hydraulic integrity of the containment system was assessed using data from continuous monitoring of water levels at selected monitoring well pairs located on opposite sides of the slurry wall, monthly water level measurements, and associated meteorological data. The monitoring data demonstrated that the slurry wall is performing effectively. The lack of response of groundwater levels inside the containment system to precipitation suggest that the cover system is performing effectively. Therefore, based on extensive monitoring data collected at the site, the existing containment system with the interim groundwater removal pumping (30,000 gallons per month) appears to provide hydraulic control of the contained area.

Subsurface Soil Quality

A soil boring program was conducted by Geraghty & Miller at the PAS site from August 26, 1991 through September 17, 1991. Eleven soil borings designated B-1 through B-7, B-9, M-21, M-22, and M-23 were drilled at the locations indicated on Figure 3-3.

One hundred ten (110) subsurface soil samples from nine borings drilled during the SRI were subjected to field headspace screening analysis using both a total organic vapor detector and a field gas chromatograph (GC). Subsurface soil samples collected above the

overburden water table to the north and east of the containment system (lowest points of the slurry wall) contained only trace levels (at or below detection limits) of contamination.

The two samples from each SRI boring with the highest VOC headspace concentration were subjected to laboratory analyses for the TCL VOCs by CLP. CLP data are usually considered to provide higher quality data than field screening analyses. Low concentrations of VOCs were reported for these SRI subsurface soil samples by the off-site CLP laboratory. A summary of the analytical results is presented in Tables 5-1 thru 5-5 of the SRI. Of the 19 samples analyzed, 15 samples had no VOCs detected, three had trace concentrations (i.e., below the contract required quantitation limits [CRQL]) with total VOCs (TVOCs) ranging from 1 to 6 µg/kg, and one sample had TVOCs of 102 µg/kg. The compound detected at the highest concentration in the latter sample was 4-methyl-2-pentanone (76 µg/kg). It was the only VOC detected above the CRQL in the SRI subsurface soil samples, it was not detected in any other SRI subsurface soil samples, and it was not detected in groundwater above the New York State Class GA Groundwater Quality Standard of 50 micrograms per liter (NYCRR, Title 6, Parts 701-703), suggesting that its presence in soil is not having an adverse impact on groundwater quality. Other VOCs detected at trace concentrations (i.e., at or below 9 µg/kg) in subsurface soils outside the containment system consist of ethylbenzene, xylene, toluene, and 2-butanone.

TCL SVOCs were detected in 10 of the 19 SRI soil samples. Of the 64 targeted compounds, only 13 were detected, 12 of which are phenols, PAHs, or phthalates. In the samples in which SVOCs were detected, their total concentrations ranged from 88 µg/kg to 2,869 µg/kg. Only three compounds were reported at concentrations greater than the CRQL: phenol in boring B-1, and bis(2-ethylhexyl)phthalate in borings B-3 and B-4. Bis(2-ethylhexyl) phthalate was detected most frequently and also had the highest concentrations.

Four TCL pesticides (methoxychlor, endrin, 4,4'-DDD, 4,4'-DDT) were detected at concentrations ranging from 2.1 µg/kg to 6.3 µg/kg (all below the CRQL, but above the method detection limit) in 3 of 19 samples. Aroclor-1260 was the only PCB detected in the subsurface soil. It was detected in one sample at 36 µg/kg, and in another sample at 690 µg/kg. These pesticides/PCBs were not detected in groundwater samples collected under the SRI and Long Term Monitoring Plan (LTMP).

Nineteen soil samples were analyzed for TAL inorganic parameters (metals and cyanide). No site-specific background samples were collected as part of the SRI. A summary of the analytical results can be found in the SRI (Tables 5-1 thru 5-5). Antimony, mercury, selenium, thallium, and silver were not detected in any of the SRI subsurface soil samples. Cadmium was detected in only one sample at a concentration of 1.2 mg/kg. Cyanide was detected in six soil samples ranging in concentration from 0.75 mg/kg to 1.2 mg/kg.

There are no federal or New York State ARARs for soils. In addition, site-specific background data for soils do not exist. SRI soil samples collected between the containment

system and White Creek to the north and east of the PAS site contained TCL compounds, mostly at trace concentrations below the CRQL. Additionally, TAL metals were not detected in subsurface soils at concentrations greater than the background range for the Eastern United States.

Groundwater Quality

Groundwater quality has been assessed through a review of data generated under the LTMP being conducted by NYSDEC and URS, as well as data generated during the SRI, in order to evaluate the potential release of site-related contaminants from the containment system. A complete listing of the analytical results summarized and discussed below is presented in tables 5-6 thru 5-19 of the SRI.

As part of the LTMP, URS sampled wells located in both the overburden and bedrock hydrogeologic units. The three new SRI bedrock monitoring wells (M-21, M-22, and M-23) were sampled as part of the SRI. Three rounds of LTMP data (November 1990, May 1991, and November 1991) and two rounds of data collected during the SRI (October 1991 and November 1991) have been evaluated. The LTMP includes collection of groundwater samples for VOCs and SVOCs from 15 overburden monitoring wells, 4 bedrock monitoring wells, and a leachate collection well LCW-2 (inside the slurry wall). Although the SRI/FS study area is outside the slurry wall, data from LCW-2 have been included for comparative purposes. During the SRI, samples were collected from bedrock monitoring wells M-21, M-22, and M-23 and analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL inorganic parameters (total metals, dissolved metals, and cyanide). Overburden groundwater samples were not collected during the SRI.

Benzene, toluene, ethylbenzene, xylenes (total BTEX - 1790 µg/l), nickel (173 µg/l), arsenic (34 µg/l), and phenolic compounds (79 µg/l) were detected north of the containment system in both the overburden and bedrock aquifers; chlorinated ethanes/ethenes (278 µg/l) exceeding ARARS were detected in areas northwest of the containment system. (See Table 1.) There is no indication that groundwater quality in the overburden north of White Creek has been affected because the Creek appears to act as a hydraulic barrier to shallow groundwater flow beyond the Creek.

Chemical-specific ARARs for groundwater at the PAS site include Federal Safe Drinking Water Act Maximum Contaminant Levels and Maximum Contaminant Level Goals (MCLs and MCLGs, respectively, 40 CFR Part 141), New York Safe Drinking Water Act MCLs (NYCRR, Title 10, Part 5-1), and New York State Groundwater Quality Standards (NYCRR, Title 6, Parts 701-703). The above standards are tabulated, along with site monitoring data for downgradient and upgradient monitoring wells, in Table 1 for the overburden and bedrock units. The significance of the presence of groundwater contaminants is also summarized in the next section of the ROD.

TVOCs reported in the other ten overburden monitoring wells outside the slurry wall have ranged from 2 µg/l to 3,409 µg/l. TVOCs detected in groundwater within the slurry wall at LCW-2 ranged from 43,770 µg/l to 45,930 µg/l. Xylene, toluene, ethylbenzene, acetone, 4-methyl-2-pentanone, 1,1-dichloroethene, and 1,2-dichloroethene were present at concentrations greater than 5,000 µg/l during at least one sampling event. Benzene concentrations were much lower (100 and 470 µg/l, respectively). Chemical-specific ARARs were exceeded for several VOCs.

Groundwater samples collected from bedrock well M-21 contained TVOC concentrations ranging from 387 µg/l to 1,035 µg/l. VOCs were not detected in upgradient bedrock well LR-2 during any of the LTMP events. The primary compounds detected, in order of decreasing concentration, were xylene, ethylbenzene, benzene, chloromethane, chlorobenzene, toluene, acetone, and styrene.

Chemical-specific ARARs for several VOCs were exceeded in M-21. Based upon the SRI bedrock groundwater data, in conjunction with the LTMP data for LR-8, OD-3 and OD-4, the VOCs found in the vicinity of these wells occur in a narrow plume.

Total SVOC concentrations detected in the overburden monitoring wells ranged from 1 µg/l to 129 µg/l. The only SVOC above ARARs is 2,4-dimethylphenol in LR-8. The highest total SVOC concentration detected was in LR-3 (92 µg/l), which is located side-gradient to the containment system. The highest detected concentration for a single SVOC was di-n-butylphthalate (76 µg/l), also in LR-3. With the exception of benzene detected during only one sampling round, VOCs were not detected at monitoring well LR-3 and di-n-butylphthalate was detected above chemical-specific ARARs in upgradient overburden wells LD-2 and SWW-1. Therefore, these SVOCs in LR-3 are likely not to be site-related.

Chemical-specific ARARs were exceeded in LR-6 (naphthalene for all three sampling rounds) and LR-8 (naphthalene for all three sampling rounds and 2,4-dimethylphenol for Spring 1991 and Fall 1991).

Six SVOCs were detected in samples collected from bedrock well M-21 in evels ranging from 1 µg/l for butylbenzylphthalate to 45 µg/l for 2,4-dimethylphenol.

Chemical-specific ARARs were marginally exceeded only in M-21. Phenol was detected at 3 µg/l; 2,4-dimethylphenol was detected at 45 µg/l; and naphthalene was detected at 7 µg/l.

The following metals were detected in both filtered and unfiltered samples collected from all of the wells that were sampled: aluminum at concentrations ranging from 59.9 µg/l to 10,900 µg/l, barium at concentrations ranging from 454 µg/l to 1,640 µg/l, calcium at concentrations ranging from 118,000 µg/l to 199,000 µg/l, iron at concentrations ranging from 67 µg/l to 8,780 µg/l, magnesium at concentrations ranging from 33,500 µg/l to 69,400 µg/l, manganese at concentrations ranging from 110 µg/l to 4,480 µg/l, nickel at

concentrations ranging from 9.4 µg/l to 173 µg/l, potassium at concentrations ranging from 4,500 µg/l to 198,000 µg/l, sodium at concentrations ranging from 88,000 µg/l to 155,000 µg/l; and zinc at concentrations ranging from less than 2 µg/l to 26.3 µg/l. In general, higher concentrations were observed in unfiltered samples.

Chromium was detected in unfiltered samples at concentrations ranging from 4.4 to 21.1 µg/l, and copper was detected in unfiltered samples at concentrations ranging from 7.4 to 84 µg/l. Vanadium was detected in unfiltered samples at concentrations ranging from 6.8 to 17.8 µg/l. Chromium, copper, and vanadium were not detected in any filtered samples, indicating that they are present in suspended sediments or colloids.

Arsenic was detected in filtered and unfiltered samples at concentrations ranging from 6.4 to 20.2 µg/l. Arsenic was not detected in filtered or unfiltered samples from well M-22, which is located immediately downgradient of the containment system. Concentrations of arsenic ranged up to 18 µg/l in upgradient bedrock groundwater samples collected during the initial RI/FS at the PAS site. Therefore, the arsenic concentrations detected are considered to be within the range of local background concentrations. Cobalt was sporadically detected in filtered and unfiltered samples at concentrations ranging up to 6.6 µg/l. Lead was also sporadically detected in both filtered and unfiltered samples from all three wells at concentrations ranging up to 4.1 µg/l. Antimony, beryllium, cadmium, mercury, selenium, silver, thallium, and cyanide were not detected in any of the groundwater samples.

Chemical-specific ARARs for barium, chromium, iron, manganese, and nickel were exceeded in well M-21. However, with the exception of nickel, the concentrations of these metals detected at well M-21 were less than the upgradient wells including those at the East Seneca Street Dump. The maximum reported concentration of nickel was 173 µg/l which is above the 100 µg/l MCL. Therefore, nickel appears to be the only site-related metal in groundwater. Nickel was detected in the leachate collection system at concentrations greater than that detected in groundwater outside the containment system.

Surface Water and Sediment Quality

No VOCs or PCBs have been detected in surface water at the PAS site, but PCBs have been detected in upstream surface water and sediment near the Fire Training School. The surface waters near the PAS site were found to contain only trace amounts of SVOCs and pesticides. TAL inorganics were detected at concentrations which are less than both chemical-specific ARARs and upstream sample concentrations. Butylbenzylphthalate was detected at slightly higher concentrations in downstream samples, but no chemical-specific ARARs are available for this compound. Its detection in upstream surface water samples indicates that it is probably due to a source located upstream of the PAS site. Phthalates are commonly reported as false positive results because they are common laboratory contaminants, and are also contained in plastic sampling gloves.

Benzene (0.09 µg/kg at location SS-4B) was the only VOC detected in sediment during the LTMP. However, benzene was detected in White Creek sediments upstream of the PAS site during the original RI/FS (URS, 1985a). The only VOC detected in samples collected during the SRI was 2-butanone at a concentration of 27 µg/kg.

Trace levels of Methoxychlor, endrin, ketone, 4,4'-DDE, 4,4'-DDT were detected in upstream sediment samples from White Creek. Trace levels of Dieldrin, endosulfan II, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were detected in upstream sediment samples from Wine Creek.

The Hazard Index, which reflects noncarcinogenic effects for a human receptor, was estimated to be 1.7 for children from surface water, sediment, and fish ingestion. It should be noted that, while the Hazard Index associated with the ingestion of surface water, sediment, and fish by children exceeds the acceptable level, it is uncertain whether the PAS site is the source of this contamination, since there are several potential sources of surface water and sediment contamination located upstream of the site.

PCBs were detected in six of the eight sediment samples. The most frequently detected PCB was Aroclor-1254, which was reported in six samples at concentrations ranging from 7 µg/kg to 5,500 µg/kg. Aroclor-1260 was detected on White Creek at a concentration of 1,300 µg/kg, and at the Smith's Beach wetland at a concentration of 36 µg/kg. However, Aroclor-1260 was also detected in upstream sediment samples at the Fire Training center adjacent to White Creek. No PCBs were detected in Wine Creek just upstream of its confluence with White Creek. Based upon the results of the qualitative ecological assessment, a potentially significant impact may occur to mink, if present at the site, because of their extreme sensitivity to PCBs.

The highest concentrations of SVOCs, pesticides, and PCBs are primarily located in areas of low stream velocity, which allows deposition of fine-grained sediments and colloids to which these constituents are adsorbed. Sediments upgradient of the PAS site have elevated levels of PAHs, pesticides, PCBs, and metals.

Contaminant Fate and Transport

The data suggest that contaminants in the bedrock aquifer originated from within the containment system and have migrated vertically downward through the lodgement till. The inferred source area for contaminants in the bedrock aquifer is the center of the containment system where the lodgement till is relatively thin. Analytical results from a monitoring well located northeast of the containment area indicate the contaminants from this area are primarily volatile organic compounds.

Investigations at Adjacent Sites

The upgradient East Seneca Street Dump, Niagara Mohawk Fire Training School, and Oswego Castings site (see Figure 2) are potential sources of contamination to the PAS site. Reports prepared for the NYSDEC indicate that both the East Seneca Street Dump and the Fire Training School may have contributed to the contamination of the soil, groundwater, surface water, and sediments in the vicinity of the PAS site. According to these reports, volatile organic compounds, semi-volatile organic compounds, and metals were detected in the groundwater at the East Seneca Street Dump. Because of the lack of data, it is not clear if the volatile organic compounds are also contaminants of concern at the Fire Training School. Available information suggests that the Fire Training School may be a source of PCBs in the surface water and sediments in White Creek in the vicinity of the PAS site. In addition, the Oswego Castings site remains a concern as a potential source which may be contributing to PCB contamination in the wetlands adjacent to the Smith's Beach community. PCB concentrations in the sediments are close to the values reported to cause adverse reproductive and survival effects. Based upon the results of the qualitative ecological assessment, a potentially significant impact may occur to mink if present at the site because of their extreme sensitivity to PCBs.

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[3]. The baseline risk assessment estimates the human health and ecological risk which could result from the contamination at the site, if no remedial action were taken.

Human Health Risk Assessment

EPA conducted a baseline risk assessment to evaluate the potential risks to human health and the environment associated with the PAS site in its current state. The Risk Assessment focused on contaminants in the groundwater, subsurface soils, surface soils, and sediments which are likely to pose significant risks to human health and the environment.

EPA's baseline risk assessment addressed the potential risks to human health by identifying several potential exposure pathways by which the public may be exposed to contaminant releases at the site under current and future land-use conditions. The baseline risk assessment began with selecting contaminants of concern that would be representative of site risks. The summary of the contaminants of concern for human health in sampled matrices is listed in Tables 2 thru 8 for human health and the environmental receptors, respectively. These contaminants include: arsenic, benzene, vinyl chloride, barium and manganese. Several of the contaminants are known to cause cancer in laboratory animals and are suspected to be human carcinogens. Several exposure pathways were evaluated

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3 The baseline risk assessment assumed that the groundwater containment system was in place and that the groundwater leachate was being pumped at a sufficient rate to contain the contamination within the containment system.

under possible on-site current and future land-use conditions. The exposure pathways considered are shown in Table 3. The reasonable maximum exposure (RME), defined as the maximum exposure that could be reasonably be expected to occur, was evaluated.

Under current EPA guidelines, the likelihood of carcinogenic (cancer-causing) and noncarcinogenic effects as a result of exposure to site chemicals are considered separately. An assumption is made that carcinogenic toxic effects of the site-related chemicals would be additive. The same assumption is made for noncarcinogens at the site.

Potential carcinogenic risks were evaluated using the cancer slope factors (SFs) developed by EPA for the contaminants of concern. Cancer SFs have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. The SF for the compounds of concern are presented in Table 4.

For known or suspected carcinogens, EPA considers excess upper-bound individual lifetime cancer risks of between 10^{-4} to 10^{-6} to be acceptable. This level indicates that an individual has approximately a one in ten thousand to one in a million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year period under specific exposure conditions at the site. The results of the baseline risk assessment indicate that only the potential future exposure to the bedrock aquifer via ingestion posed an unacceptable risk to human health (see Table 5).

The cumulative upper-bound cancer risk at the site is $7x10^{-4}$ for children and $8x10^{-4}$ for adults. Hence, the risks for carcinogens at the site are not within the acceptable risk range of 10^{-4} to 10^{-6} (see Table 5). The estimated total risks are primarily due to arsenic, which contributed 29.45% to the carcinogenic risk calculations, and which was attributable to ingesting water from the bedrock aquifer. This presents an unacceptable carcinogenic risk for children, for example, of $7x10^{-4}$ (i.e., 7 additional persons out of ten thousand are at risk of developing cancer if the groundwater is not remediated). Other than groundwater bedrock ingestion, the other carcinogenic risks associated with the site are in the acceptable range. These estimates were developed by taking into account various conservative assumptions about the likelihood of a person being exposed to these media.

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and safe levels of intake (Reference Doses). Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of milligrams/kilogram-day (mg/kg-day), are estimates of daily exposure levels for humans which are thought to be safe over a

lifetime (including sensitive individuals). The reference doses for the compounds of concern at the site are presented in Table 6. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) are compared to the RfD to derive the hazard quotient for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds across all media that impact a particular receptor population.

An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures. The HI provides a useful refererice point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. A summary of the noncarcinogenic risks associated with these chemicals across various exposure pathways is found in Table 7.

Referring to this table, the Hazard Indexes were estimated to be 26 for adults and 15 for children (both for future use) from ingestion of groundwater from the bedrock aquifer and 1.7 for children (for both current and future uses) from surface water, sediment, and fish ingestion. All other Hazard Indexes were less than 1. It should be noted that, while the Hazard Index associated with the ingestion of surface water, sediment, and fish by children exceeds the acceptable level, it is uncertain whether the PAS site is the source of this contamination, since there are several potential sources of surface water and sediment contamination located upstream of the site.

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; and
- 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 error 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 would actually come in contact with the chemicals of concern, the period of time over which such exposure would 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.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the Risk Assessment Report.

Central tendency is a statistical measure that identifies the single most representative value for an entire distribution of values. It represents the mid-range risk scenario. In the PAS risk assessment, the central tendency calculations for adult carcinogenic risks for residential ingestion and inhalation of overburden groundwater decreased by an order of magnitude when compared to RME risks.

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 contaminants of concern, 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.

The ecological risk assessment began with evaluating the contaminants present in the vicinity of the site in conjunction with the site-specific biological species/habitat information. A qualitative field survey and habitat characterization of the PAS site identified potential on-site habitats of concern: a grassy field overlying the capped area of the landfill and two wetland habitats (White Creek stream run and the White Creek ponded marsh). Off-site habitats of concern included the Wine Creek wetlands and the Smith's Beach marsh at Lake Ontario, located to the north of the site.

Contaminants of concern related to the surface waters of these habitats included aluminum, cyanide, and the pesticide DDT. The contaminants of concern in the sediments located adjacent to and downstream of the site included four volatile organic compounds, nineteen semi-volatile compounds, seven pesticides, three PCB mixtures, five metals, and cyanide. A summary of the majority of contaminants of concern and the environmental receptors is presented in Table 8.

Following a biological characterization of the resident species associated with the site, a select list was developed for the purpose of assessing actual or potential risks that may accrue to these receptors (and other similar species) when exposed to site-related contaminants. Consideration was given to the economic and/or cultural value of species, statutory concerns (e.g., threatened or endangered status), representation of different trophic levels, habitat suitability, the actual species occurrence within the site environs, and home ranges. The selected organism list consisted of the Shorttail shrew and mink (as terrestrial fauna), the mink, green-backed heron, and Spring Peeper (as organisms dependent upon the aquatic environment, i.e., surface water and sediment), and the fathead minnow (as a surface water only ecological receptor). In the qualitative ecological assessment, literature-based values, indicative of contaminant concentrations that are known to produce adverse effects to the receptors, were used to screen the affected site media. Individual toxicity endpoints such as survival, reproductive effects, and growth impacts were considered.

The qualitative ecological assessment found that aquatic species and aquatic invertebrates, in particular, are the most at risk as indicated by the similarity of detected surface water and sediment values in the vicinity of the site to toxicity values. Subletha.l effects of contaminant toxicity may be occurring at the site. As some of the contaminants present bioaccumulate, affected aquatic invertebrates may be posing a risk to upper trophic level species who use them as a food source. The potential for transmitting risk through the food chain is present for the fathead minnow, a resident species at the site, as PCBs have been detected in fish collected from creeks at the site. In addition, the minnows are expected to have continual exposure to elevated levels of aluminum, DDE, and DDT, although this exposure is not likely to threaten fish survival. Although a definitive statement cannot be made regarding impacts to the Spring Peeper and other amphib.ous life, the contaminants aluminum and DDT/DDE are present at levels that strongly indicate toxicity to these aquatic receptors. There is a potential risk to the green-backed heron through its diet (a significant portion of its exposure) from DDT/DDE, PCBs, aldrin, and metals. PCB concentrations in the sediments are close to the values reported to cause adverse reproductive and survival effects. The shrew, typifying small mammals at the site, is expected to have relatively low exposures to surface water/sediment, and thereby any adverse health risks are assumed to be sublethal. Contaminant body burdens, however, may transfer contaminants to higher trophic level organisms (e.g., mink and green-backed heron). Reproduction or survival of these higher forms could be impacted via this transfer, mostly caused by the bioaccumulable DDT/DDE, PCBs, aldrin, and some metals. Based upon the results of the qualitative ecological assessment, a potentially significant impact may occur to mink if present at the site because of their extreme sensitivity to PCBs. Detected sediment levels are well within the range of values reported to cause reproductive impairment and mortality, via their dietary (aquatic sources) exposure. An additional investigation will be conducted to determine whether PAS is a source of this contamination.

It should be noted that, while the levels of PCBs, PAHs, and pesticides present in the sediments (in the depositional areas of the creeks and wetlands) in the vicinity of the site may pose an unacceptable risk to individual mink that might use the creeks and adjacent wetlands as foraging areas, it is uncertain whether the PAS site is the source of this contamination, since there are several potential sources of surface water and sediment contamination located upstream of the site.

In summary, actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in the ROD, may present an imminent and substantial endangerment to public health, welfare or 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 and standards such as ARARs and risk-based levels established in the risk assessment.

Groundwater contamination has been detected outside the containment area in concentrations above ARARs and background concentrations in the overburden and bedrock aquifers. Therefore, the following remedial action objectives have been established for groundwater:

- prevent potential future exposures to contaminated groundwater on-site, as well as off-site in the area between the site and Smith's Beach;
- restore groundwater quality to levels consistent with federal and state groundwater quality and drinking water standards;
- mitigate the off-site migration of contaminated groundwater.

DESCRIPTION OF REMEDIAL ACTION ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that a remedial action must be protective of human health and the environment, 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, 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 §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 §121(d)(4), 42 U.S.C. §9621(d)(4).

This ROD evaluates in detail, three remedial alternatives for addressing the contamination associated with the PAS site. The time to implement a remedial alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate with the responsible parties, procure contracts for design and construction, or conduct operation and maintenance activities at the site.

For each of the three remedial alternatives evaluated, three options for treatment/disposal of the extracted groundwater and leachate are presented: discharge to the City of Oswego's Eastside Wastewater Treatment Plant without any pretreatment, other than flow equalization (the "POTW Option"); on-site treatment and discharge to the White/Wine Creek (the "On-Site Treatment Option"); and off-site treatment and disposal at an approved TSD facility (the "TSD Option"). Each of the three disposal options are discussed in detail following the discussion of the remedial alternatives.

The remedial alternatives are:

Alternative 1 - No Further Action

Cost\Option	POTW	On-site	TSD
Capital	$115,000	$1,220,000	$0
Annual Operation & Maintenance	$110,000	$205,000	$395,000
Present Worth	$1,450,000	$3,750,000	$4,870,000
Estimated Construction Time	2 months	6 months	On-going

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison of other alternatives. At this site, the "no-action" alternative has been interpreted as the "No Further Action," since previously implemented remedial and removal actions continue to provide hydraulic control of the existing containment system.

No Further Action involves continued operation of the source control remedial systems, which includes:

- a containment system (including a cover and a soil-bentonite slurry wall);
- extraction and collection of leachate and overburden groundwater from within the containment system;
- treatment and disposal of the collected leachate and groundwater;
- site security and access control by a perimeter fence;
- continued site maintenance; and
- long-term monitoring.

Alternative 2 - Enhanced Source Control

Cost\Option	POTW	On-site	TSD
Capital	$870,000	$1,970,,000	$755,000
Annual Operation & Maintenance	$140,000	$245,000	$560,000
Present Worth	$2,590,000	$5,040,000	$7,730,000
Estimated Construction Time	4 months	8 months	2 months

Enhanced source control includes the actions and technologies as described for No Further Action, plus the following additional measures:

- enhancing the present source control system by optimizing the leachate and groundwater extraction rate and other operating parameters in order to achieve, to the degree practicable, inward horizontal gradients in the overburden and upward vertical gradients from the bedrock toward the containment system;

- connecting downgradient residents in the Smith's Beach area using who are residential wells to the public water supply to ensure that potential future exposure to contaminants in the bedrock groundwater does not occur; and

- recommending institutional controls on groundwater usage through deed restrictions at the PAS site and downgradient from the site to and including the Smith's Beach area.

This alternative relies on enhanced source control through optimization of pumping rates and frequencies and other methods as well as natural attenuation of contaminants to restore groundwater quality outside the existing containment system. The current pumping rate is achieving hydraulic control, however, it is estimated that the rate(s) would be optimized between the present 30,000 gal/month and about 50,000 gal/month to achieve inward and upward gradients. An evaluation of potential methods for development of hydraulic controls outside the containment system will be evaluated during the remedial design. Potential methods which could be employed to provide enhanced source control might include:

- raising water levels in White Creek using the present dam in order to enhance inward gradients along the northern side of the containment system;

- constructing a groundwater control trench along the upgradient, southwestern side of the containment system to eliminate potential overtopping of outside groundwater into the containment system in this location; and

- maintaining low water levels in the leachate and groundwater collection systems by controlling the pumping frequency and/or rate (potentially with automated controls) in order to enhance inward horizontal gradients across the slurry wall (i.e., groundwater flow inward rather than outward toward the slurry wall), and at the same time enhancing upward vertical gradients from the bedrock.

Alternative 3 - Enhanced Source Control With Bedrock Groundwater Extraction and Treatment

Cost\Option	POTW	On-site	TSD
Capital	$1,110,000	$1,940,000	990,000
Annual Operation & Maintenance	$200,000	$300,000	$1,260,000
Present Worth	$3,600,000	$5,660,000	$16,670,000
Estimated Construction Time	8 months	1 year	6 months

This alternative includes the same components as Alternative 2 and adds extraction, treatment, and disposal of groundwater from the bedrock aquifer downgradient from the containment system, with the goal of achieving groundwater ARARs more quickly than with Alternative 2 (all groundwater will be combined and treated and disposed of in the same manner).

Under this alternative, bedrock extraction wells would be placed to intercept the contaminants detected in the bedrock aquifer downgradient of the containment system. The extraction wells would be located and pumped to effect drawdown in the area where contaminated groundwater has been detected. So as not to adversely impact the vertical hydraulic gradients beneath the existing containment system, a preliminary estimate of the potential amount of bedrock groundwater that may be removed from the bedrock aquifer in this area is very low, only one to two gallons per minute (gpm).

Summary of Treatment and Disposal Options

Three options for the treatment/disposal of the extracted groundwater and leachate were evaluated: the POTW Option; the On-Site Treatment Option; and the TSD Option. These treatment and disposal options do not impact the remedial alternatives' effectiveness or

implementability with respect to other components. Each treatment and disposal option provides a permanent solution which reduces the toxicity and volume of contaminants, and provides for the discharge of treated effluent and the disposal of any treatment residue. The treatment and disposal options are described in the following paragraphs.

POTW Option

This option provides for the discharge of leachate and groundwater removed from the site to the City of Oswego's East Side Wastewater Treatment Plant. The Wastewater treatment plant is less than a mile from the PAS site and discharge from the site storage tank would be conveyed to the wastewater treatment plant via a sewer connection to the Mitchell Street sewer extension, which was constructed in 1989. Alternatively, if deemed appropriate, the bedrock groundwater could be directly discharged by connection to the Mitchell Street sewer; with a pipeline to the on-site storage tank, thus, eliminating the need to cross White Creek and its wetland. The POTW Option cannot be implemented until the facility completes an upgrade and expansion of the existing system to 5.35 mgd by November 30, 1994, as required under a consent order with the NYSDEC. Additionally, the PAS site would be considered a significant industrial user (SIU) and would require an industrial wastewater discharge permit. The permit would be obtained from the City of Oswego and would regulate the leachate quality from the site. All the permits necessary to allow the connection of the leachate to the sewer line can be obtained before the completion of the upgrade/expansion. The construction of the sewer line connection can be completed prior to the completion of the POTW expansion/upgrade.

A study conducted by the PRPs regarding the feasibility of discharging leachate from the PAS site to the wastewater treatment plant indicated that the PAS leachate includes organic contaminants that are amenable to treatment in a biological treatment system, such as the one at the wastewater treatment plant. Also, the study indicated that the metals in the leachate are low in comparison to the allowable levels at the wastewater treatment plant, and would not inhibit wastewater treatment effectiveness or restrict sludge incineration. Although the leachate would be classified as a RCRA-listed waste (waste code F039), it would fall within the Domestic Sewage Exclusion, 40 CFR 261.4, and would not require a RCRA permit for purposes of discharge to the wastewater treatment plant. The study concluded that the PAS leachate would:

- not affect wastewater treatment plant employee health and safety;
- conform with the City of Oswego's pretreatment requirements; and
- not impact the wastewater treatment plant's ability to comply with its effluent limitations or sludge disposal requirements.

On-Site Treatment Option

This option provides for the construction of an on-site treatment system for the leachate and groundwater removed from the site and discharge to White or Wine Creek or to groundwater. A preliminary, conceptual design was performed for the on-site treatment and disposal option. The design study considered a flow rate up to 50,000 gallons per month (1.2 gpm) with a treatment system. The design considered the New York State Class C surface water quality standards as discharge criteria. The conceptual system for on-site treatment and disposal at the PAS site might include equalization in an on-site tank, coagulation/flocculation, filtration, ultraviolet (UV)/chemical oxidation, ion exchange, pressure filtration of residual solids, and batch discharge from an on-site tank. The actual components and sizing of the on-site treatment system would be determined during the remedial design.

TSD Option

At present, the leachate and groundwater pumped from within the PAS site containment system are being transported to the E. I. duPont de Nemours Co., Inc.'s RCRA-permitted TSD facility located in Deepwater, New Jersey for treatment and disposal. This option has the flexibility to accommodate future changes in volume and contaminant loading of the leachate and groundwater removed from the site.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA §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. 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 (legally enforceable), or relevant and appropriate (pertaining to situations sufficiently similar to those encountered at a Superfund site such that their use is well suited to the site) requirements of 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 trade-offs 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 via treatment* refers to a remedial technology's expected ability to reduce the toxicity, mobility, or volume of hazardous substances, pollutants or contaminants at the site.

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 periods until cleanup goals are achieved.

6. *Implementability* refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed.

7. *Cost* includes estimated capital and operation and maintenance costs, and the present-worth costs.

The following "modifying" criteria are considered fully after the formal public comment period on the Proposed Plan is complete:

8. *State acceptance* indicates whether, based on its review of the RI/FS reports and the Proposed Plan, the State supports, opposes, and/or has identified any reservations with the selected alternative.

9. *Community acceptance* refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports. Factors of community acceptance to be discussed include support, reservation, and opposition by the community.

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

- o Overall Protection of Human Health and the Environment

For the present land-use scenario, all alternatives are considered to provide nearly equal protection to human health and the environment, since there were no present risks defined by the risk assessment. For the future land-use scenario, Alternative 2 is considered to be

more protective than Alternative 1 for mitigation of the future human health risk of ingestion of contaminated groundwater. Alternative 2 provides protection of human health through the connection of downgradient residents in the Smith's Beach area using residential wells to the public water supply and institutional restrictions related to the use of the groundwater at the site and downgradient of the site to Smith's Beach. Alternative 2 also includes enhanced source control to mitigate any future release of contaminants from within the existing containment system.

Since Alternative 3 involves pumping the groundwater in the bedrock aquifer, it would provide a greater degree of protection to human health and the environment than Alternative 2. The three treatment and disposal option components are considered to be equal for this evaluation criterion.

o Compliance with ARARs

Alternative 2 would attain ARARs more quickly than Alternative 1 due to the enhanced source controls provided under Alternative 2. Both alternatives rely on natural attenuation and source control to achieve compliance with groundwater ARARs outside the containment system. Alternative 3 includes extraction of the bedrock groundwater which should achieve groundwater ARARs more quickly than the other options. The ARARs for restoring groundwater quality to drinking water standards are listed in Table 1.

The three treatment and disposal option components are considered to be equal for this evaluation criterion.

o Long-Term Effectiveness and Permanence

Potential future migration of the contaminants from the containment system would be reduced by Alternatives 2 and 3 in comparison to Alternative 1, by optimizing leachate/groundwater removal system pumping rates and frequencies. For all alternatives, contaminant concentrations due to previous releases to the groundwater would be at present levels in the short-term. In the long-term, Alternative 3 would better reduce contaminant concentrations in the bedrock aquifer. Bedrock groundwater pumping at this site, however, could adversely affect the hydraulic control capability of the containment system, as well as adversely impact the creeks and wetlands. If studies indicate that bedrock groundwater pumping would adversely affect the containment system or the wetlands, then it would not be implemented. Alternative 2 has less long-term reliability than Alternative 3 because it relies to some extent on institutional controls on groundwater usage, until drinking water standards are reached through natural attenuation.

Treatment and disposal of the collected leachate and groundwater by any of the treatment and disposal options would be reliable and essentially equal in eliminating environmental risks from treatment residuals.

o Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternatives 2 and 3 would reduce toxicity, mobility, and volume of the contaminants more quickly than Alternative 1 due to treatment of potentially higher volume of leachate and groundwater removed from within the containment system. The highest reduction would be achieved via Alternative 3, since it involves the extraction and treatment of the bedrock aquifer. The three treatment and disposal options would permanently reduce the toxicity, mobility, and volume of contaminants for all alternatives and, therefore, be considered equal.

o Short-Term Effectiveness

It is anticipated that the study, design, and implementation of hydraulic source control enhancements for Alternatives 2 and 3 would be able to be accomplished relatively quickly in the short term. In the short term, the bedrock groundwater pumping will stop further contamination of the bedrock aquifer.

There are differences between the treatment and disposal options with respect to short-term effectiveness. Since the off-site TSD Option is presently used, no time would be needed for construction and implementation of this option to achieve protection. Hence, there would be no adverse impact on human health and the environment.

The POTW Option requires construction of the sewer connection pipeline, and connection of the tank to the pipeline which might take several weeks to complete. There would be some potential for on-site accidents and worker exposure to contaminated media from these construction activities. These risks would be minimized with proper health and safety training and personal protective equipment. Also, there is some uncertainty as to the period of time needed to complete the POTW expansion and receive the necessary approvals for accepting the leachate and groundwater from the site. It is estimated that 1½ years will be required to complete these activities. All the permits necessary to allow the connection of the leachate to the sewer line can be obtained before the completion of the upgrade/expansion. The construction of the sewer line connection can be completed prior to the completion of the POTW expansion/upgrade. Additionally, the POTW must be willing to accept the PAS leachate and issue the PRPs an SIU permit under its pretreatment program.

As with the POTW Option, there would be some potential for on-site accidents and worker exposure to contaminated media from the construction activities associated with the On-Site Treatment Option. These risks would be minimized with proper health and safety training and personal protective equipment. The On-Site Treatment Option would likely take several months longer to design, construct and begin operation (early 1995) than the POTW Option (late 1994).

- Implementability

Each of the alternatives employs commonly available technologies, methods, and procedures. No Further Action is already implemented and the additional actions included in Alternative 2 could be implemented easily. Alternative 3 would be slightly more difficult to implement than Alternative 2, since Alternative 3 involves the additional action of pumping from the bedrock aquifer. A study will be conducted to determine whether bedrock groundwater pumping would affect the hydraulic control capability of the containment system adversely, or adversely impact the creeks and wetlands. If this study concludes that there will be no adverse impacts, then the installation of the bedrock wells will be easy to implement.

Implementability of the three treatment and disposal options is considered equivalent in terms of their reliability, constructability, and operation. The on-site treatment option, however, would require the performance of treatability studies to determine the design and operating parameters of the treatment system. Connection of the leachate and groundwater collection system(s) to the sewer would be easily implemented. However, the Oswego POTW must receive approval from the NYSDEC and EPA to accept the PAS leachate.

There are differences in administrative implementation for the three treatment and disposal options. The POTW Option requires approval from the City of Oswego, EPA, and NYSDEC to accept the PAS leachate and groundwater discharge. Additionally, the City of Oswego must be in compliance with their discharge permit and have completed an upgrade/expansion (scheduled for November 1994). An on-site treatment facility would require compliance with New York State stream standards, but no formal permit would be required. The TSD Option is presently implemented, and no additional administrative requirements have been identified.

o Cost

Cost estimates were developed for each of the remedial alternatives and treatment and disposal options. The present-worth costs are calculated using a discount rate of 7 percent and a 30-year time interval. The estimated capital, annual operation and maintenance (O&M), and present worth costs for each of the alternatives are presented below.

Alternative 1 Costs			
	POTW Option	On-site Option	TSD Option
Capital	$115,000	$1,220,000	$0
Annual O&M	$110,000	$205,000	$395,000
Present Worth	$1,450,000	$3,750,000	$4,870,000
Alternative 2 Costs			
	POTW Option	On-site Option	TSD Option
Capital	$870,000	$1,970,000	$755,000
Annual O&M	$140,000	$245,000	$560,000
Present Worth	$2,590,000	$5,040,000	$7,730,000
Alternative 3 Costs			
	POTW Option	On-site Option	TSD Option
Capital	$1,110,000	$1,940,000	$990,000
Annual O&M	$200,000	$300,000	$1,260,000
Present Worth	$3,600,000	$5,660,000	$16,670,000

For each of the three alternatives, the POTW Option has the lowest present worth cost and the TSD Option would be the most costly. For each of the treatment/discharge options, the increase in costs from Alternative 1 ("No Further Action") to Alternative 2 (enhanced source control) to Alternative 3 (enhanced source control plus bedrock pumping) is due to the increase in volume of groundwater and leachate.

The capital costs of the POTW Option for each alternative includes the design and construction of the sewer line connection to the Mitchell Street sewer. The annual cost for this option includes operation and maintenance of the groundwater extraction, treatment, and discharge system, operation and maintenance of the site cover, user fee paid to the East Oswego POTW, and for long-term monitoring.

The capital costs of the On-site Treatment Option for each alternative includes the design and construction of the on-site treatment plant. The annual cost for this option includes operation and maintenance of the groundwater extraction, treatment, and discharge system in addition to the operation and maintenance of the site cover, and for long-term monitoring. The capital costs of the TSD Option for Alternatives 2 and 3 include installation of additional investigatory wells, pumping tests and analysis and preparation of a report. The annual costs for this option includes operation and maintenance of the groundwater extraction, (at an increased pumping rate), and transportation and disposal fees, in addition to the operation and maintenance of the site cover, and for long-term monitoring.

The least costly alternative and option is the "No Further Action" Alternative with the POTW Option. The most costly alternative and option is Alternative 3 with groundwater and leachate treatment/disposal at an off-site TSD facility.

o State Acceptance

NYSDEC concurs with the selected remedy.

o Community Acceptance

Comments received during the public comment period indicate that the public generally supports the preferred remedy, however, there were some concerns that were expressed related to the treatment and disposal of the leachate and groundwater from the PAS site at the City of Oswego's wastewater treatment plant. The primary concerns were related to the wastewater treatment plant's ability to adequately treat the contaminated groundwater and leachate. 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

After reviewing the alternatives and public comments, EPA and NYSDEC have determined, that (subject to the outcome of the bedrock aquifer investigation referred to below) Alternative 3 is the appropriate remedy for the site, because it best satisfies the requirements of CERCLA §121, 42 U.S.C. §9621, and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR §300.430(e)(9).

The major components of the selected remedy are as follows:

Alternative 3 incorporates all of the existing components currently at the site, including the existing containment system (slurry wall, cover, and leachate and groundwater collection systems); treatment and disposal of the collected leachate and groundwater; site security and access control by the perimeter fence; site operation and maintenance; and long-term

monitoring. Alternative 3 would also incorporate the following additional components: enhancing the present source control system by optimizing the leachate and groundwater extraction rate and other operating parameters in order to achieve inward horizontal gradients in the overburden and, to the degree practicable, upward vertical gradients from the bedrock toward the containment system; bedrock groundwater extraction and treatment; connecting downgradient residents in the Smith's Beach area using residential wells to the public water supply to ensure that potential future exposure to contaminants in the bedrock groundwater does not occur; and recommending institutional controls on groundwater usage through deed restrictions at the PAS site and downgradient from the site to and including the Smith's Beach area.

This alternative also includes other potential methods for providing, to the degree practicable, enhanced hydraulic gradient control of the existing containment system. The feasibility of potential methods for development of hydraulic controls outside the containment system will be evaluated during the remedial design. Potential methods which could be employed to provide enhanced source control include: raising water levels in White Creek using the present dam in order to enhance inward gradients along the northern side of the containment system; constructing a groundwater control trench along the upgradient, southwestern side of the containment system to eliminate potential overtopping of outside groundwater into the containment system in this location; and maintaining low water levels in the leachate and groundwater collection trenches by controlling the pumping frequency and/or rate, potentially with automated controls, in order to enhance inward horizontal gradients across the slurry wall, and at the same time enhancing upward vertical gradients from the bedrock.

During the remedial design, an investigation will be undertaken to better define the extent of contamination of the bedrock aquifer, to verify that the increased interim groundwater removal pumping from the overburden aquifer within the containment system has created upward vertical gradients between the bedrock and overburden aquifers, to determine the potential effectiveness of pumping to contain impacted groundwater in the bedrock outside the containment system, to evaluate the hydraulic potential to restore the bedrock aquifer's water quality, and to determine potential impacts of bedrock groundwater pumping on vertical gradients beneath the containment system and the creeks and wetlands. Should the results of this investigation determine that bedrock pumping will be an effective means of addressing the contamination in the bedrock aquifer without adversely impacting the existing containment system or the creeks and wetlands, then an analysis to determine the rate of extraction and the location of the bedrock extraction wells will be performed, followed by implementation of the bedrock groundwater extraction and treatment. Should the investigation indicate that bedrock groundwater pumping will have a significant, adverse

impact on the containment system or the creeks and wetlands, this decision will be documented in a pre-remedial design study report concurred upon by New York State[4].

The preferred option for the treatment and disposal of the leachate and groundwater for the selected alternative is the POTW Option, which provides for discharge of the leachate and groundwater removed from the PAS site to the City of Oswego's wastewater treatment plant. Selection of the POTW Option is contingent upon final acceptance of the PAS discharge by the City of Oswego, as well as approval by EPA and NYSDEC. In the event that the POTW Option cannot be implemented, the On-Site Treatment Option would be implemented for treatment and disposal. The On-Site Treatment Option provides for the construction of an on-site treatment system for the leachate and groundwater removed from the site and discharge to White or Wine Creek or to groundwater. The components and sizing of the treatment system would be determined during the remedial design. The treatment and disposal of the leachate and groundwater via the off-site TSD will continue until a final treatment option is selected and implemented.

Since there is some uncertainty related to the source of the pesticides detected in the surface water of the adjacent creeks and the PCB contamination in the sediments in the depositional areas of the creeks and wetlands, in conjunction with evaluating the data generated by the ongoing and planned studies related to the adjacent East Seneca Street Dump, Niagara Mohawk Fire Training School, and Oswego Castings sites, a study will be conducted to determine the source of contamination to the surface water and sediments located in the adjacent creeks and wetlands. If, based upon these investigations, it is determined that the contamination in the adjacent creeks and wetlands is attributable to the PAS site, then remedial alternatives to address this contamination will be evaluated.

Also, a floodplain delineation will be completed during remedial design, to determine whether the site is located within the 100- or 500-year flood contours. If the site is located within the 100- or 500-year floodplain and it appear that remedial activities will be conducted in the floodplain, a floodplain assessment will be completed so that appropriate measures can be incorporated into the remedial design, to protect against potential flood impacts.

STATUTORY DETERMINATIONS

As previously noted, CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that a remedial action must be protective of human health and the environment, 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

[4] In accordance with CERCLA Section 117(c) and Section 300.435(c)(2)(i) of the NCP, if bedrock groundwater pumping is not implemented, then an Explanation of Significant Differences, describing the modification to the selected remedy and the basis for the change, will be published.

preference for remedial actions which employ treatment to permanently anc significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

For the reasons discussed below, EPA has determined that the selected remedy meets the requirements of CERCLA §121, 42 U.S.C. §9621.

Protection of Human Health and the Environment

The selected alternative will mitigate future human health risk of ingestion of contaminated groundwater through the connection of downgradient residents in the Smith's Beach area using residential wells to the public water supply and institutional controls related to the use of the groundwater at the site and downgradient of the site to Smith's Beach. The selected alternative also includes enhanced source control to mitigate any future release of contaminants from within the existing containment system and extraction of contaminated groundwater from the bedrock aquifer.

Compliance with ARARs

Attainment of chemical-specific ARARs outside the containment system in the overburden and bedrock aquifers will be hastened by optimizing the leachate and groundwater extraction rate and other operating conditions of the present source control system in order to achieve, to the degree practicable, inward horizontal gradients in the overburden and upward vertical gradients from the bedrock toward the containment system. In addition, bedrock groundwater extraction will hasten the attainment of chemical-specific ARARs in the bedrock aquifer. A summary of chemical-specific ARARS for specific contaminants is presented in Table 1. Action- and location-specific ARARs will be complied with during implementation.

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 Maximum Contaminant Levels and Maximum Contaminant Level Goals (MCLs and MCLGs, respectively, 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
- 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:

- 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 Sediment Criteria, December 1989
- 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

Cost-Effectiveness

The selected remedy provides effectiveness proportional to its cost. The total present-worth cost for the selected remedy is $3,600,000 for the POTW Option and $5,660,000 for the On-Site Treatment Option.

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

The connection of downgradient residents in the Smith's Beach area using residential wells to the public water supply is a permanent solution to meeting their drinking water needs. Also, groundwater will be collected via permanent extraction wells and collection systems and either treated off-site at a POTW or at a treatment system located on-site.

The selected remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable. The extraction and subsequent treatment of groundwater will permanently and significantly reduce the toxicity, mobility, and volume of contaminants in the groundwater. The selected remedy provides the best balance of trade-offs among the alternatives with respect to the evaluation criteria.

Preference for Treatment as a Principal Element

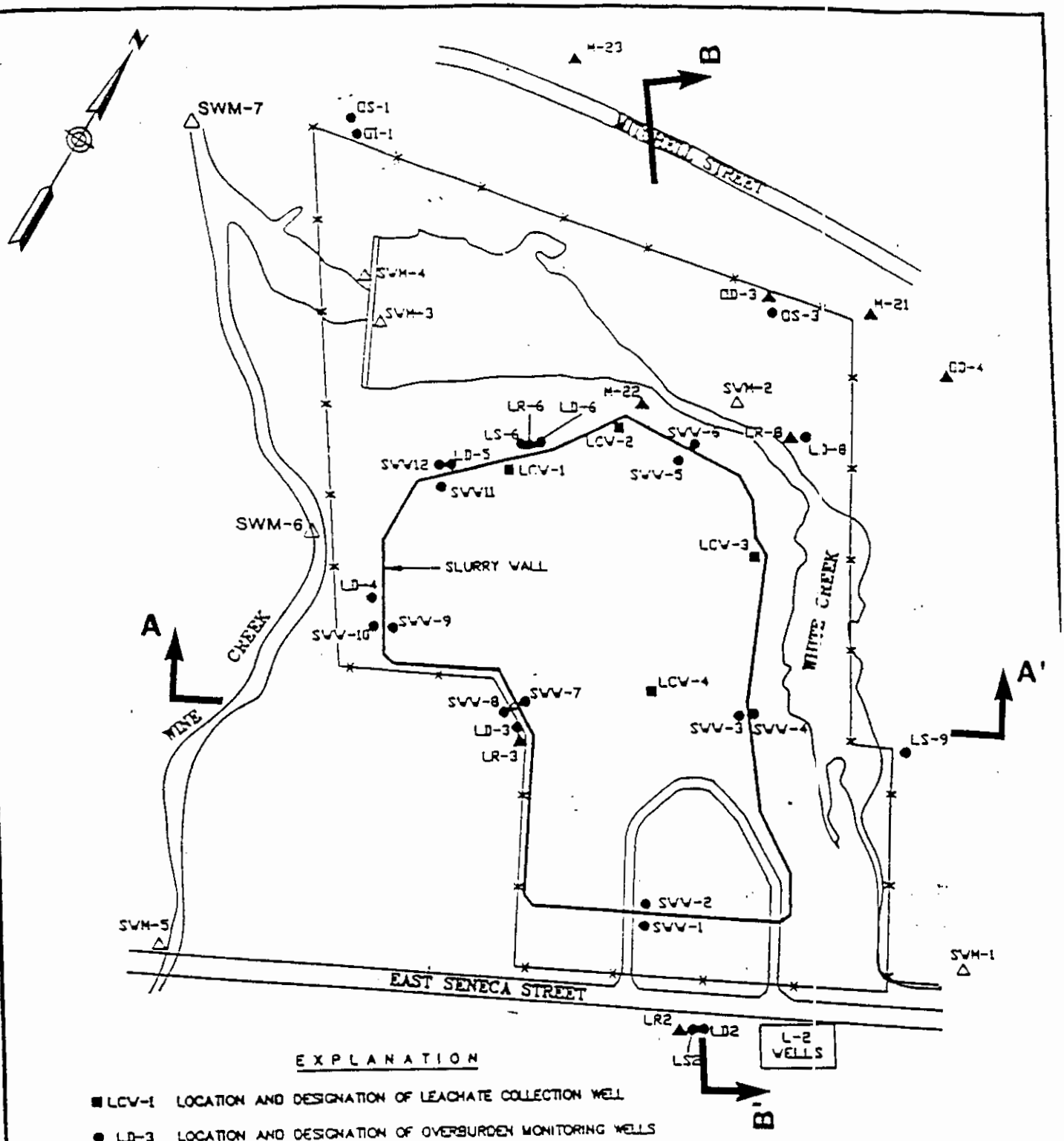
The statutory preference for remedies that employ treatment as a principal element is satisfied by all three groundwater and leachate treatment options.

DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes from the selected alternative presented in the Proposed Plan.

APPENDIX I

FIGURES



EXPLANATION

- ■ LCV-1 LOCATION AND DESIGNATION OF LEACHATE COLLECTION WELL
- ● LD-3 LOCATION AND DESIGNATION OF OVERBURDEN MONITORING WELLS
- ▲ M-21 LOCATION AND DESIGNATION OF BEDROCK MONITORING WELL
- △ SWM-1 LOCATION AND DESIGNATION OF SURFACE-WATER MEASURING POINT
- —×—×— FENCE

AUG 2 0 1993

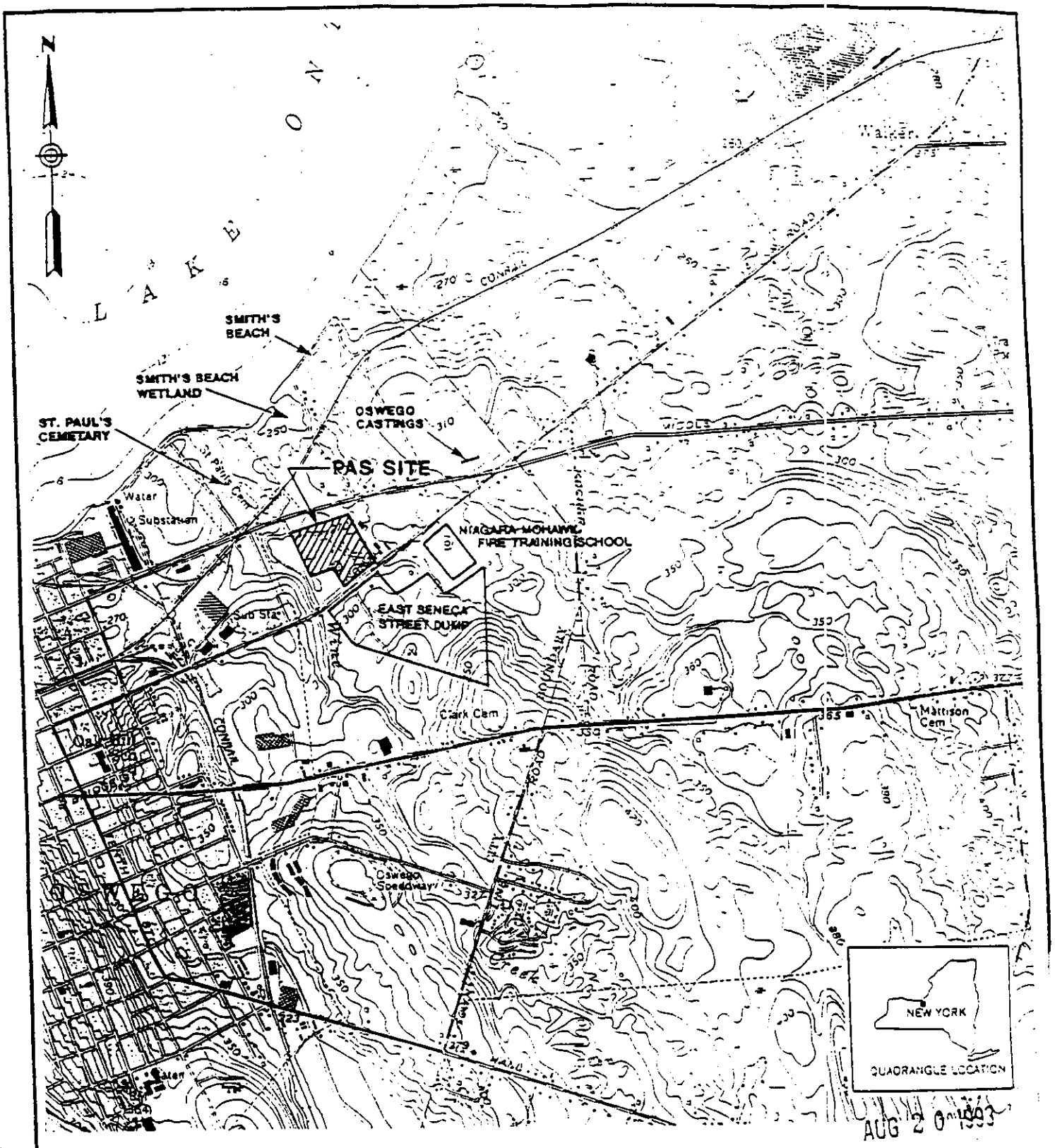
200 0 200
scale feet

SOURCE: GERAGHTY & MILLER, INC. (1992)

JOB No.:	933-6131	SCALE:	AS SHOWN
DR BY:	MRM	DATE:	04/08/93
CHK BY:	RMG	FILE No.:	NY01-309
REV BY:		DR SUBTITLE:	02

EXISTING MONITORING WELLS AND CROSS SECTION LOCATION

FIGURE



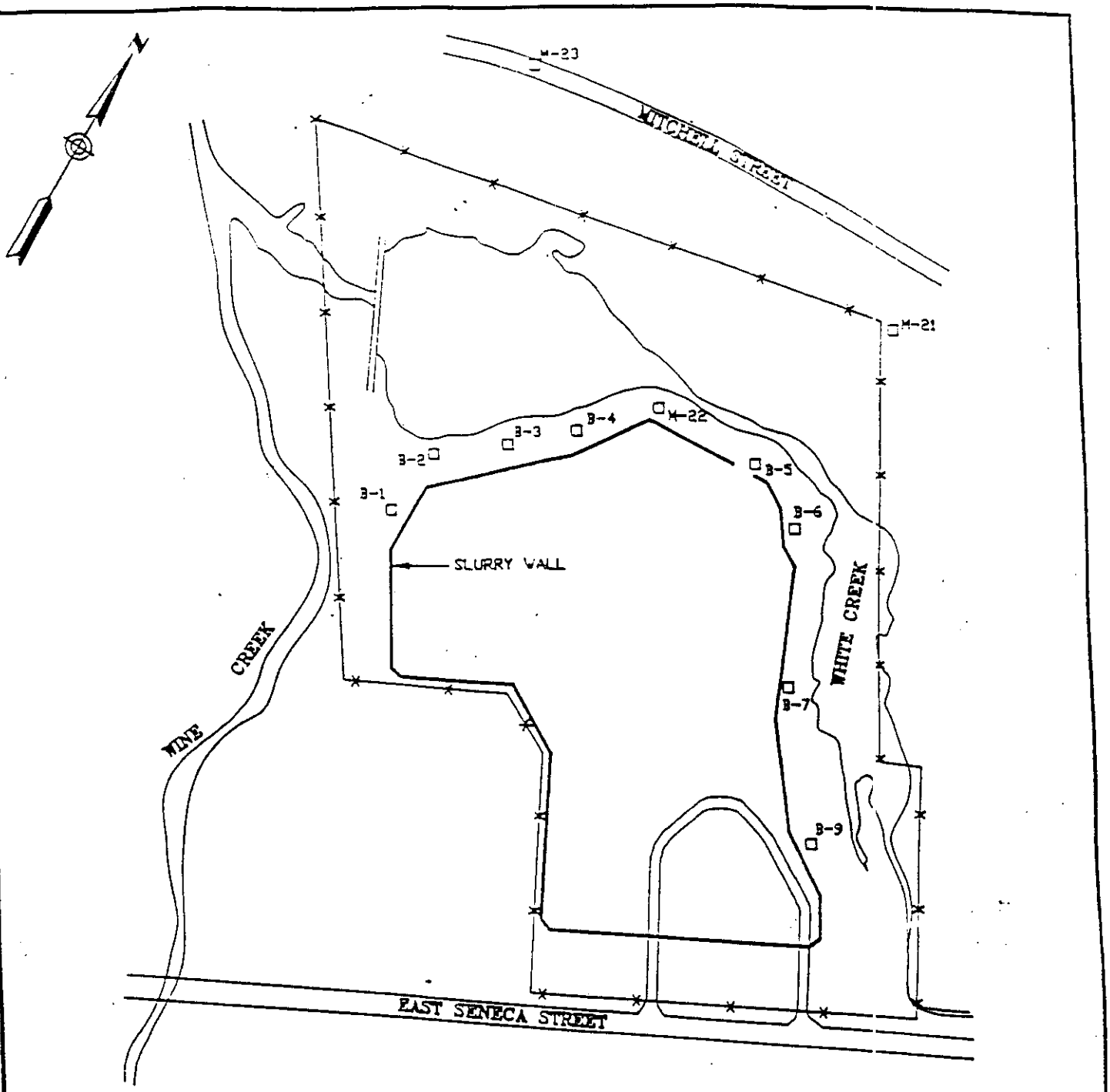
AUG 2 0 1993

SOURCE: BASE MAP TAKEN FROM U.S.G.S. 7.5 MINUTE QUADRANGLE OSWEGO EAST, NEW YORK, DATED 1954, PHOTOREVISED 1978.

2000 0 2000
scale feet

JOB No.:	933-6131	SCALE:	AS SHOWN
DR BY:	MRM	DATE:	04/08/93
CHK BY:	RMG	FILE No.:	NY01-318
REV BY:		OR SUBTITLE:	02

AREA MAP



EXPLANATION

B-1 □ LOCATION AND DESIGNATION OF SOIL BORING

—×—×— FENCE

JUL U 1 1993

200 0 200

scale feet

SOURCE: GERAGHTY & MILLER, INC. (1992)

JOB No.:	933-6131	SCALE:	AS SHOWN
DR BY:	MRM	DATE:	04/08/93
CHK BY:	RMG	FILE No.:	NY01-308
REV BY:		DR SUBTITLE:	02

SRI SOIL BORING LOCATIONS

APPENDIX II

TABLES
for Groundwater Sample Results

PROJECT NO. 033-8131

TABLE 1

SUMMARY OF OVERBURDEN GROUNDWATER DATA AND FEDERAL/STATE CHEMICAL-SPECIFIC ARARs

POLLUTION ABATEMENT SERVICES SITE
OSWEGO, NEW YORK

CONSTITUENT INFORMATION						FEDERAL SAFE DRINKING WATER ACT			NEW YORK STATE CLASS GA GROUND WATER QUALITY STANDARDS	NEW YORK STATE DRINKING WATER ACT	PRELIMINARY REMEDIATION GOAL
Site	Constituent Authority (Units)	Upgradient Concentration Range of Constituent (ug/l) NA	Downgradient Concentration Range of Constituent (ug/l) NA	Maximum Concentration Greater than ARARs Downgradient ? (Yes / No) NA	Upgradient ? (Yes / No) NA	MCL (ug/l) 40 CFR Sec. 141.11 141.16 (Relevant & Appropriate)	SMCL (ug/l) 40 CFR Sec. 143.3 (Relevant & Appropriate)	MCLG (ug/l) 40 CFR Sec. 141 (Relevant & Appropriate) (1)	Standard (2) (ug/l) NYCRR, Title 6 Sect. 701 - 703 (Applicable)	MCL (ug/l) (3) NYCRR, Title 10 Part 5 - 1 (Relevant & Appropriate)	(ug/l) (4) 40 CFR Part 300
1 - 4	VINYL CHLORIDE	ND	ND - 31	Y	N	2		zero	2 (a)	2	2
1 - 3	CHLOROETHANE	ND	ND - 180	Y	N				5 (a)	5 (POC)	5
1 - 2	METHYLENE CHLORIDE	ND	ND - 8	Y	N	5		zero	5 (a)	5 (POC)	5
1 - 1	ACETONE	ND	ND - 22	N	N					50 (UOC)	NA
1 - 3	1,1 - DICHLOROETHANE	ND	ND - 50	Y	N				5 (a)	5 (POC)	5
58 - 8	1,2 - DICHLOROETHENE (total)	ND	ND - 28	Y	N				5 (a)	5 (POC)	5
06 - 2	1,2 - DICHLOROETHANE	ND	ND - 8	Y	N	5		zero	5 (a)	5 (POC)	5
5 - 6	1,1,1 - TRICHLOROETHANE	ND	ND - 2	N	N	200		200	5 (a)	5 (POC)	NA
1 - 6	TRICHLOROETHENE	ND	ND - 8	Y	N	5		zero	5 (a)	5 (POC)	5
3 - 2	BENZENE	ND	ND - 600	Y	N	5		zero	0.7 (a)	5 (POC)	0.7
10 - 1	4 - METHYL - 2 - PENTANONE	ND	ND - 2	N	N					50 (UOC)	NA
80 - 3	TOLUENE	ND	ND - 100	Y	N	1000		1000	5 (a)	5 (POC)	5
90 - 7	CHLOROBENZENE	ND	ND - 10	Y	N	100		100	5 (a)	5 (POC)	5
41 - 4	ETHYLBENZENE	ND	ND - 640	Y	N	700		700	5 (a)	5 (POC)	5
20 - 7	XYLENES (total)	ND	ND - 1000	Y	N	10000		10000	5 (a)	5 (POC)	5
85 - 0	BENZOIC ACID	ND	ND - 1	N	N					50 (UOC)	NA
44 - 5	4 - METHYLPHENOL	ND	ND - 33	Y	N				1 (a)	50 (UOC)	1
87 - 9	2,4 - DIMETHYLPHENOL	ND	ND - 99	Y	N				1 (a)	50 (UOC)	1
57 - 6	2 - METHYLNAPHTHALENE	ND	ND - 3	N	N					50 (UOC)	NA
74 - 2	DI - N - BUTYLPHTHALATE	ND - 51	ND - 88	Y	Y					50 (UOC)	NA
81 - 7	BIS (2 - ETHYLHEXYL)PHTHALATE	ND - 12	ND - 4 (J)	N	Y	6		zero	50 (a)	50 (UOC)	NA
84 - 0	DI - N - OCTYLPHTHALATE	ND	ND - 2 (J)	N	N						

ES.

1 Only non - zero MCLGs are ARAR in accordance with the NCP.

2 S = Standard, g = NYSDEC guidance value, which is "to be considered", not ARAR

3 Total Principal Organic Contaminants (POCs) and Unspecified Organic Contaminants (UOCs) may not exceed 100 ug/l

4 Total Principal Organic Contaminants (POCs) and Unspecified Organic Contaminants (UOCs) may not exceed 100 ug/l

5 NA = not applicable, ND = not detected, Blank spaces indicate that no value has been published under the cited authority.

1003

SUMMARY OF BEDROCK GROUNDWATER DATA AND FEDERAL/STATE CHEMICAL-SPECIFIC ARARs
POLLUTION ABATEMENT SERVICES SITE
OSWEGO, NEW YORK

TABLE 1 (Cont'd)

No	Constituent / Authority (Status)	CONSTITUENT INFORMATION: Upgradient Concentration Range of Constituent (ug/l)	Downgradient Concentration Range of Constituent (ug/l)	Maximum Concentration Greater than ARARs: Downgradient ? (Yes / No)	Upgradient ? (Yes / No)	FEDERAL SAFE DRINKING WATER ACT: MCL (ug/l)	SMCLs (ug/l)	MCLGs (ug/l)	NEW YORK STATE CLASS GA GROUND WATER QUALITY STANDARDS: Standard (2) (ug/l)	NEW YORK STATE DRINKING WATER ACT: MCLs (ug/l) (3)	PRELIMINARY REMEDIATION GOAL (ug/l) (4)
	Authority (Status)	NA	NA	NA	NA	40 CFR Sec. 141.11 - 141.16 (Relevant & Appropriate)	40 CFR Sec. 143.3 (Relevant & Appropriate)	40 CFR Sec. 141 (Relevant & Appropriate) (1)	NYCRR, Title 6 Sect 701 - 703 (Applicable)	NYCRR, Title 10 Part 5 - 1 (Relevant & Appropriate)	40 CFR Part 300
4	VINYL CHLORIDE	ND	ND - 32	Y	N	2		zero	2 (s)	2 (-)	2
3	CHLOROETHANE	ND	ND - 47	Y	N				5 (s)	5 (POC)	5
3	METHYLENE CHLORIDE	ND	ND - 1 (J)	N	N	5		zero	5 (s)	5 (POC)	NA
2	ACETONE	ND	ND - 2 (J)	N	N					50 (DOC)	NA
1	1,1-DICHLOROETHENE	ND	ND - 0.8 (J)	N	N	7		7	5 (s)	5 (POC)	NA
4	1,1-DICHLOROETHANE	ND	ND - 40	Y	N				5 (s)	5 (POC)	5
3	1,1-DICHLOROETHANE	ND	ND - 6	Y	N				5 (s)	5 (POC)	5
1 0	1,2-DICHLOROETHENE (total)	ND	ND - 4 (J)	N	N	5		zero	5 (s)	5 (POC)	NA
3 2	1,2-DICHLOROETHANE	ND	ND - 100	Y	N	200		200	5 (s)	5 (POC)	5
6	1,1,1-TRICHLOROETHANE	ND	ND - 2 (J)	N	N	5		zero	5 (s)	5 (POC)	0.7
6	TRICHLOROETHENE	ND	ND - 100	Y	N	5		zero	0.7 (s)	5 (POC)	5
2	BENZENE	ND	ND - 95	Y	N	1000		1000	5 (s)	5 (POC)	5
5 4	TOLUENE	ND	ND - 34	Y	N	100		100	5 (s)	5 (POC)	5
8 7	CHLOROBENZENE	ND	ND - 100	Y	N	700		700	5 (s)	5 (POC)	NA
1 4	ETHYLBENZENE	ND	ND - 3 (J)	N	N	100		100	5 (s)	5 (POC)	5
2 5	STYRENE	ND	ND - 670	Y	N	10000		10000	5 (s)	5 (POC)	NA
20 7	XYLENES (total)	ND	ND - 3 (J)	N	N	800		800	4.7 (s)	50 (DOC)	1
1	1,2-DICHLOROBENZENE	ND	ND - 3 (J)	Y	N				1 (s)	50 (DOC)	1
5 2	PHENOL	ND	ND - 2 (J)	Y	N				1 (s)	50 (DOC)	1
4 5	4-METHYLPHENOL	ND	ND - 45	Y	N				1 (s)	50 (DOC)	1
17 8	2,4-DIMETHYLPHENOL	ND	ND - 7 (J)	N	N				10 (u)	50 (DOC)	NA
3	NAPHTHALENE	ND	ND - 3 (J)	N	N				5 (s)	5 (POC)	NA
17 8	4-CHLOROANILINE	ND	ND - 0.8 (J)	N	N					50 (DOC)	NA
7 8	2-METHYLNAPHTHALENE	ND	ND - 1 (J)	N	N				50 (u)	50 (DOC)	NA
3 2	DIETHYLPHTHALATE	ND	ND - 70	Y	N	100		zero		50 (DOC)	50
4 2	DI-N-BUTYLPHTHALATE	ND	ND - 16	N	N			zero	50 (u)	50 (DOC)	NA
8 7	BUTYLBENZYLPHTHALATE	ND	ND - 12	N	N				ND (s)	5 (POC)	NA
81 7	BIS (2-ETHYLHEXYL)PHTHALATE	ND	ND - 3 (J)	N	?				ND (s)	5 (POC)	NA
84-6	DI-N-OCTYLPHTHALATE		ND - 0.0043 (JP)	Y	?				0.1 (s)	2	NA
84-6	ALPHA-BHC		ND - 0.0084 (JP)	Y	?	2		zero	0.1 (s)	2	NA
88-2	ALDRIN		ND - 0.020 (JP)	N	?	2		zero			NA
71-9	ALPHA-CHLORDANE		ND - 0.0034 (JP)	N	?						NA
74-2	GAMMA-CHLORDANE		59.9 - 10900	N	Y		50 - 200		25 (s)	50	NA
90-5	ALUMINUM	ND - 1000	ND - 20.2	N	N	50			1000 (s)	2000	NA
38-2	ARSENIC	ND - 14	454 - 1840	Y	Y	2000		2000			
39-3	BARIUM	34 - 3700									

Golder Associates

SUMMARY OF BEDROCK GROUNDWATER DATA AND FEDERAL/STATE CHEMICAL-SPECIFIC ARARs
POLLUTION ABATEMENT SERVICES SITE
OSWEGO, NEW YORK

CONSTITUENT INFORMATION						FEDERAL SAFE DRINKING WATER ACT			NEW YORK STATE CLASS GA GROUND WATER QUALITY 6 NYCRR	NEW YORK STATE DRINKING WATER ACT	PRELIMINARY REMEDIATION GOAL
CAS No	Constituent Authority (Status):	Upgradient Concentration Range of Constituent (ug/l) NA	Downgradient Concentration Range of Constituent (ug/l) NA	Maximum Concentration Greater than ARARs Downgradient ? (Yes / No) NA	 Upgradient ? (Yes / No) NA	MCL (ug/l) 40 CFR Sec. 141.11 - 141.16 (Relevant & Appropriate)	SMCLs (ug/l) 40 CFR Sec. 143.3 (Relevant & Appropriate)	MCLGs (ug/l) 40 CFR Sec. 141 (Relevant & Appropriate) (1)	Standard (2) (ug/l) NYCRR, Title 6 Sect 701 - 703 (Applicable)	MCLs (ug/l) (3) NYCRR Title 10 Part 5 - 1 (Relevant & Appropriate)	(ug/l) (4) 40 CFR Part 300
0-70-2	CALCIUM	15000 - 471000	118000 - 168000	N	N						NA
0-47-3	CHROMIUM	ND - 22	ND - 21.1	Y	Y	100		100	50 (s)	10	NA
0-50-8	COPPER	ND - 20	ND - 84	N	N	TT (1300)	1000	1300	200 (s)	1300 (7)	NA
0-89-6	IRON	244 - 12000	ND - 8780	Y	Y		300		300 (s)	300 (5)	NA
0-92-1	LEAD	ND - 8	ND - 4.1	N	N	TT (15)		zero	25 (s)	15 (7)	NA
0-95-4	MAGNESIUM	10400 - 185000	33500 - 89400	N	Y				35000 (u)		NA
0-96-5	MANGANESE	45.55 - 1070	110 - 4480	Y	Y		50	200	300 (s)	300 (5)	NA
0-02-0	NICKEL	ND - 92.2	ND - 173	Y	N	100		100			100
0-09-7	POTASSIUM	1360 - 50100	ND - 10600	N	N					/	NA
0-23-5	SODIUM	4010 - 2771000	88000 - 155000	N	Y				20000 (s)	20000 - 270000 (6)	NA
0-66-8	ZINC	4.2 - 45	ND - 28.3	N	N		5000		300 (s)	5000	NA

NOTES:

1 Only non-zero MCLGs are ARAR in accordance with the NCP.

2 S = Standard, g = NYSDEC guidance value, which is "To be considered", not ARAR

3 Total Principal Organic Contaminants (POCs) and Unspecified Organic Contaminants (UOCs) may not exceed 100 ug/l.

4 Preliminary Remediation Goals are listed for analytes which exceed ARARs at and downgradient of the site, but which do not exceed ARARs upgradient of the site.

5 Total concentration of iron and manganese may not exceed 500 ug/l.

6 Sodium MCL of 20000 ug/l reserved for people on severe restricted sodium diets, Sodium MCL of 270000 ug/l reserved for people on moderately restricted sodium diets.

7 Reserved for Action Level in New York State

8 NA = not applicable, ND = not detected, TT = treatment technology - based standard, action level given in parentheses. Blank spaces indicate that no value has been published under the cited authority

TABLE 1 (Cont'd)

REMEDIAL ACTION OBJECTIVES

MEDIA
Groundwater

TO PROTECT HUMAN HEALTH:
Prevent ingestion of water containing the following contaminants which are either (1) present at concentrations greater than ARARs (or background, whichever is greater), (2) calculated to present a potential carcinogenic risk greater than 1E-04 to 1E-06, or (3) calculated to present a potential for non-carcinogenic health effects, based upon a Hazard Quotient greater than 1.

WATER-BEARING UNIT
Overburden

CHEMICAL	MAXIMUM DETECTED DOWNGRADIENT CONC (ug/l)	LIMITING ARAR (ug/l)	CANCER RISK
Benzene	680	0.7	1.60E-04
Chlorobenzene	16	5	
Chloroethane	180	5	
1,1-Dichloroethane	56	5	
1,2-Dichloroethane	8	5	
1,2-Dichloroethene (total)	28	5	
Ethylbenzene	540	5	
Methylene Chloride	8	5	
Toluene	160	5	
Trichloroethene	9	5	
Vinyl Chloride	33	2	2.00E-04
Xylenes	1900	5	
2,4-Dimethylphenol	69	1	
4-Methylphenol	33	1	

Bedrock

CHEMICAL	MAXIMUM DOWNGRADIENT CONC (ug/l)	LIMITING ARAR (ug/l)	CANCER RISK
Benzene	100	0.7	1.60E-04
Chlorobenzene	34	5	
Chloroethane	47	5	
1,1-Dichloroethane	49	5	
1,2-Dichloroethene (total)	8	5	
Ethylbenzene	120	5	
Toluene	95	5	
1,1,1-Trichloroethane	180	5	
Vinyl Chloride	32	2	2.00E-04
Xylenes	670	5	
Di-n-butylphthalate	75	50	
4-Methylphenol	2	1	
2,4-Dimethylphenol	45	1	
Phenol	3	1	
Nickel	173	100	

TABLE 2

PAS OSWEGO SITE
EXPOSURE POINT CONCENTRATIONS (EPCs)

Chemicals of Potential Concern:	95% UCL	Maximum	EPC
GROUNDWATER			
	(ug/l)	(ug/l)	(ug/l)
OVERBURDEN			
Volatile Organics			
Benzene	48	880	48
Vinyl Chloride	9.0	33	9.0
Semivolatile Organics			
None			
Inorganics			
Arsenic	NA	NA	-
Barium	NA	NA	-
Manganese	NA	NA	-
	(ug/l)	(ug/l)	(ug/l)
BEDROCK			
Volatile Organics			
Benzene	130	34	34
Vinyl Chloride	16	32	16
Semivolatile Organics			
None			
Inorganics			
Arsenic	29	30	30
Barium	1200	1500	1360
Manganese	1,300,000	4400	4400
SUBSURFACE SOILS			
	(ug/kg)	(ug/kg)	(ug/kg)
Pesticides/PCBs			
Aroclor-1248	78,000,000	2200	2200
Aroclor-1260	8500	890	890
Dieldrin	180	43	43
Alpha-Chlordane	160	25	25
	(mg/kg)	(mg/kg)	(mg/kg)
Inorganics			
Arsenic	4.7	5.1	4.7
Barium	71	90	71
Beryllium	0.36	0.38	0.36
Cadmium	0.92	1.2	0.92
Chromium, VI	2.0	2.2	2.0
Manganese	1100	1100	1100
Nickel	16	18	16
Vanadium	18	22	18
SURFACE WATER			
	(ug/l)	(ug/l)	(ug/l)
Pesticides/PCBs			
Beta-BHC	0.042	0.0073	0.0073
Dieldrin	0.17	0.013	0.013
Inorganics			
Barium	78	75	75
Cyanide	11	12	11
Manganese	260	220	220
SEDIMENTS			
	(ug/kg)	(ug/kg)	(ug/kg)
Semivolatile Organics			
Benzo(a)pyrene	1300	1200	1200
Benzo(b)fluoranthene	1400	1900	1900
Pesticides/PCBs			
Aldrin	280	720	280
Heptachlor Epoxide	19	25	19
Aroclor-1248	2200	1900	1900
Aroclor-1254	1100	5500	5500
Aroclor-1260	170	1300	170
	(mg/kg)	(mg/kg)	(mg/kg)
Inorganics			
Arsenic	8.3	12	8.3
Barium	580	2500	580
Cadmium	1.3	3.1	1.3
Manganese	1700	3400	1700
Nickel	33	39	33
Vanadium	25	48	25

TABLE 3

PAS OSWEGO SITE
IDENTIFICATION OF EXPOSURE PATHWAYS

PRESENT-USE SCENARIO

MEDIA	RECEPTOR POPULATION	EXPOSURE ROUTE	RETAINED FOR QUANTITATIVE ANALYSIS	COMMENT
GROUNDWATER	Resident	Ingestion	No	Residences on public water, except one well at Smith's Beach
		Dermal Contact	No	
		Inhalation	No	
	Commercial/ Industrial Employees	Ingestion	No	Commercial and industrial properties on public water.
		Dermal Contact	No	
		Inhalation	No	
SOILS SURFICIAL	Trespassers	Incidental Ingestion	No	Known contaminated areas covered by cap system and
		Dermal Contact	No	other areas within the fence covered with vegetation.
		Inhalation	No	Pathway will be qualitatively evaluated.
SUBSURFACE	Construction and Utility Workers	Incidental Ingestion	No	No excavation activities being conducted at site.
		Dermal Contact	No	
		Inhalation	No	
SURFACE WATER	Residents	Incidental Ingestion	Yes	Low levels of contaminants detected in surface waters.
		Dermal Contact	Yes	
		Inhalation	No	Two VOCs detected in site samples, also detected in blanks.
		Fish Ingestion	Yes	Low levels of contaminants detected in surface waters.
SEDIMENTS	Residents	Incidental Ingestion	Yes	Contaminants detected in sediments.
		Dermal Contact	Yes	

FUTURE-USE SCENARIO

MEDIA	RECEPTOR POPULATION	EXPOSURE ROUTE	RETAINED FOR QUANTITATIVE ANALYSIS	COMMENT
GROUNDWATER	Resident	Ingestion	Yes	Future use of groundwater is possible because the
		Dermal Contact*	No	aquifers are considered potable.
		Inhalation	Yes	
	Commercial/ Industrial Employees	Ingestion	Yes	Future use of groundwater is possible because the aquifers are considered potable.
		Dermal Contact	No	Workers are assumed not to shower on-site.
		Inhalation	No	
SOILS SURFICIAL	Trespassers	Incidental Ingestion	No	Known contaminated areas covered by cap system and
		Dermal Contact	No	other areas within the fence covered with vegetation.
		Inhalation	No	Pathway will be qualitatively evaluated.
SUBSURFACE	Construction and Utility Workers	Incidental Ingestion	Yes	Possible excavation activities conducted in the future.
		Dermal Contact	Yes	
		Inhalation of Particulates	Yes	
		Inhalation of VOCs	No	No VOCs detected.
SURFACE WATER	Residents	Incidental Ingestion	Yes	Low levels of contaminants detected in surface waters.
		Dermal Contact	Yes*	
		Inhalation	No	Two VOCs detected in site samples, also detected in blanks
		Fish Ingestion	Yes	
SEDIMENTS	Residents	Incidental Ingestion	Yes	Contaminants detected in sediments.
		Dermal Contact	Yes	

* - The dermal contact pathway will only be qualitatively discussed.

TABLE 4

PAS OSWEGO SITE

TOXICITY VALUES FOR POTENTIAL CARCINOGENIC HEALTH EFFECTS

DOSE - RESPONSE RELATIONSHIP (1)

CHEMICALS	CARCINOGENS: SLOPE FACTORS (SF)		
	Oral SF (mg/kg-day)-1	Inhalation SF (mg/kg-day)-1	Weight of Evidence
Volatile Organics			
Acetone			C
Benzene	2.90E-02	2.90E-02	A
2-Butanone			C
Chlorobenzene			C
Chloroethane			
Chloroform	6.10E-03	9.10E-02	B2
1,2-Dichloroethane	9.10E-02	9.10E-02	B2
1,1-Dichloroethene	6.00E-01	1.20E+00	C
1,2-Dichloroethene, cis			D
1,2-Dichloropropane	6.70E-02 (2)		B2
Ethylbenzene			D
Methylene Chloride	7.50E-03	1.65E-03	B2
4-Methyl-2-Pentanone			
Styrene			
Toluene			D
1,1,1-Trichloroethane			D
1,1,2-Trichloroethane	5.70E-02	5.70E-02	C
Trichloroethene	1.10E-02 (3)	5.00E-03 (3)	B2
Vinyl Chloride	1.90E+00 (2)	3.00E-01 (2)	A
Xylenes (Total)			D
Semivolatile Organics			
Acenapthene			D
Anthracene			D
Benzo(a)anthracene	7.30E-01**	5.10E-01**	B2
Benzoic Acid			D
Benzo(a)pyrene	7.30E+00	5.10E+00 (2)	B2
Benzo(b)fluoranthene	7.30E-01**	6.10E-01**	B2
Benzo(g,h,i)perylene			B2
Benzo(k)fluoranthene	7.30E-01**	6.10E-01**	B2
Benzyl alcohol			
Bis(2-ethylhexyl)phthalate	1.40E-02		B2
Butylbenzylphthalate			C
4-Chloroaniline			
Chrysene	7.30E-02**	5.10E-02**	B2
Di-n-butylphthalate			D
Dibenzo(a,h)anthracene	7.30E+00**	6.10E+00**	B2
Diethyl phthalate			D
Di-n-octylphthalate			
4-Chloro-3-methylphenol			
1,2-Dichlorobenzene			D
1,4-Dichlorobenzene	2.40E-02 (2)		C
2,4-Dimethylphenol			
Fluoranthene			D
Indeno(1,2,3-cd)pyrene	7.30E-01**	6.10E-01**	B2
2-Methylnaphthalene			
4-Methylnaphthalene			
2-Methylphenol			C
4-Methylphenol			C
N-Nitrosodiphenylamine	4.90E-03		B2
Naphthalene			D
Nitrobenzene			D
Phenanthrene			D
Phenol			D
Pyrene			D
Pesticides/PCBs			
Aldrin	1.70E+01	1.70E+01	B2
Alpha-BHC	6.30E+00	6.30E+00	B2
Beta-BHC	1.80E+00	1.80E+00	C
Delta-BHC			D
Gamma-BHC (Lindane)	1.30E+00 (2)		B2-C
Alpha-Chlordane	1.30E+00	1.30E+00	B2
Gamma-Chlordane	1.30E+00	1.30E+00	B2
4,4'-DDD	2.40E-01		B2
4,4'-DDE	3.40E-01		B2
4,4'-DDT	3.40E-01	3.40E-01	B2
Dieldrin	1.60E+01	1.60E+01	B2
Endosulfan			
Endrin			
Endrin Aldehyde			
Heptachlor	4.50E+00	4.50E+00	B2
		9.10E+00	B2

TABLE 4 (Cont'd)

P&S OSWEGO SITE
TOXICITY VALUES FOR POTENTIAL CARCINOGENIC HEALTH EFFECTS
DOSE - RESPONSE RELATIONSHIP (1)

CHEMICALS	CARCINOGENS - SLOPE FACTORS (SF)		
	Oral SF (mg/kg-day)-1	Inhalation SF (mg/kg-day)-1	Weight of Evidence
Inorganics	1.75E+00	1.50E+01	A
Arsenic	-	-	-
Barium	-	9.40E-03	B2
Beryllium	4.30E+00	8.30E+00	B1
Cadmium (food)	-	6.30E+00	B1
Cadmium (water)	-	-	-
Chromium III (insol. salt)	-	-	-
Chromium VI (insol. salt)	-	4.20E+01	A
Cobalt	-	-	-
Copper	-	-	D
Lead (and compounds inorg.)	-	-	B2
Manganese	-	-	D
Mercury (inorganic)	-	-	D
Nickel (sol. salt)	-	-	-
Nickel (refinery dust)	-	8.40E-01	A
Vanadium	-	-	-
Zinc (and compounds)	-	-	D
Cyanide (free)	-	-	D

NOTES:

- Aluminum, calcium, iron, magnesium, potassium and sodium are considered essential nutrients and will not be quantitatively evaluated in the risk assessment.

** Toxicity Equivalency Factors (TEFs) used in conjunction with slope factors per EPA guidance

(1) All toxicity values obtained from IRIS (on-line October 30, November 2-11, 1992, April 12, 1993) unless otherwise noted
(2) Toxicity values obtained from HEAST Annual FY-1992.
(3) Toxicity values obtained from the Superfund Health Risk Technical Support Center, December 7, 1992

EPA WEIGHT OF EVIDENCE:

A - Human Carcinogen
B1 - Probable Human Carcinogen - Limited human data are available
B2 - Probable Human Carcinogen - Sufficient evidence of carcinogenicity in animals and inadequate or no evidence in humans
C - Possible Human Carcinogen
D - Not Classifiable as to human carcinogenicity
E - Evidence of noncarcinogenicity for humans

PAS OSWEGO SITE
COMBINING CARCINOGENIC RISKS ACROSS PATHWAYS

MEDIA	RECEPTOR POPULATION	EXPOSURE ROUTE	INDIVIDUAL CANCER RISK	CHEMICAL CONTRIBUTING THE GREATEST AMOUNT TO RISK
GROUNDWATER-OVERBURDEN	Resident: Adults	Ingestion	2.20E-04	Vinyl Chloride
		Inhalation (Shower model)	2.20E-05	Benzene, Vinyl Chloride
		Total Carcinogenic Risk =	2.4E-04*	Benzene, Vinyl Chloride
	Children	Ingestion	1.90E-04	Vinyl Chloride
		Inhalation (Shower model)	1.90E-05	Benzene, Vinyl Chloride
		Total Carcinogenic Risk =	2.1E-04*	Benzene, Vinyl Chloride
GROUNDWATER-BEDROCK	Resident: Adults	Ingestion	7.7E-04	Arsenic, Vinyl Chloride
		Inhalation (Shower model)	3.7E-05	Benzene, Vinyl Chloride
		Total Carcinogenic Risk =	8.1E-04*	Arsenic, Benzene, Vinyl Chloride
	Children	Ingestion	6.8E-04	Arsenic, Vinyl Chloride
		Inhalation (Shower model)	3.2E-05	Benzene, Vinyl Chloride
		Total Carcinogenic Risk =	7.1E-04*	Arsenic, Benzene, Vinyl Chloride
SURFACE WATER, SEDIMENT, AND FISH INGESTION	Resident: Adults	Ingestion (Surface Water)	1.4E-08	--
		Dermal Contact (Surface Water)	8.8E-10	--
		Ingestion (Sediment)	1.2E-05	Aroclor-1248, Aroclor-1254, Benzo(a)pyrene, Arsenic
		Dermal Contact (Sediment)	1.4E-05	Aroclor-1254
		Ingestion (Fish)	7.0E-05	Dieldrin
		Total Carcinogenic Risk =	9.6E-05*	Aroclor-1248, Aroclor-1254, Benzo(a)pyrene, Arsenic, Dieldrin
	Children	Ingestion (Surface Water)	3.8E-08	--
		Dermal Contact (Surface Water)	1.2E-09	--
		Ingestion (Sediment)	2.1E-05	Aldrin, Aroclor-1248, Aroclor-1254, Arsenic, Benzo(a)pyrene
		Dermal Contact (Sediment)	6.1E-06	Aroclor-1248, Aroclor-1254
		Ingestion (Fish)	6.1E-05	Dieldrin
		Total Carcinogenic Risk =	8.8E-05*	Aldrin, Aroclor-1248, Aroclor-1254, Arsenic, Benzo(a)pyrene, Dieldrin
SUBSURFACE SOIL	Construction/ Utility Workers	Ingestion	1.7E-06	Aroclor-1248, Aroclor-1260, Arsenic
		Dermal Contact	1.6E-08	Aroclor-1248
		Inhalation	8.3E-09	--
		Total Carcinogenic Risk =	2.7E-06*	Aroclor-1248, Aroclor-1260, Arsenic

TABLE 5

Notes
Site workers (commercial/industrial) were only evaluated for groundwater ingestion exposure, therefore no exposure pathways could be combined.
* Indicates that the total carcinogenic risk exceeds 1.0E-06.
** Indicates that the total hazard index exceeds 1.
-- Indicates that the carcinogenic risk or noncarcinogenic hazard index does not exceed target values; therefore no chemicals were selected as contributors.

TABLE 6

PAS OSWEGO SITE
CHRONIC TOXICITY VALUES FOR POTENTIAL NONCARCINOGENIC HEALTH EFFECTS
DOSE - RESPONSE RELATIONSHIP (1)

CHEMICALS	NONCARCINOGENS: REFERENCE DOSES/CONCENTRATIONS (RfD, RfC)			
	Oral RfD (mg/kg-day)	Uncertainty Factor	Inhalation RfC (mg/kg-day)	Uncertainty Factor
Volatile Organics				
Acetone	1.00E-01	1000	-	-
Benzene	-	-	-	-
2-Butanone	5.00E-02 (2)	1000	2.90E-01	1000
Chlorobenzene	2.00E-02	1000	5.70E-03 (3)	10000
Chloroethene	-	-	2.90E+00	-
Chloroform	1.00E-02	1000	-	-
1,1-Dichloroethane	1.00E-01 (2)	1000	1.40E-01 (3)	1000
1,2-Dichloroethene	-	-	-	-
1,1-Dichloroethene	9.00E-03	1000	-	-
1,2-Dichloroethene (mixed)	9.00E-03	1000	-	-
1,2-Dichloropropane	-	-	1.10E-03	300
Ethylbenzene	1.00E-01	1000	2.90E-01	300
Methylene Chloride	6.00E-02	100	8.60E-01 (2)	100
4-Methyl-2-Pentanone	5.00E-02 (2)	1000	2.30E-02 (2)	1000
Styrene	2.00E-01	1000	2.50E-01 (2)	30
Toluene	2.00E-01	1000	1.00E-01	300
1,1,1-Trichloroethane	9.00E-02 (2)	1000	2.90E-01 (3)	1000
1,1,2-Trichloroethane	4.00E-03	1000	-	-
Trichloroethene	6.00E-03 (4)	3000	-	-
Vinyl Chloride	-	-	-	-
Xylenes (Total)	2.00E+00	100	-	-
Semivolatile Organics				
Acenaphthene	6.00E-02	3000	-	-
Anthracene	3.00E-01	3000	-	-
Benzo(a)anthracene	-	-	-	-
Benzoic Acid	4.00E+00	1	-	-
Benzo(a)pyrene	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-
Benzyl alcohol	-	-	-	-
Bis(2-ethylhexyl)phthalate	2.00E-02	1000	-	-
Butylbenzylphthalate	2.00E-01	1000	-	-
4-Chloroaniline	4.00E-03	3000	-	-
Chrysene	-	-	-	-
Di-n-butylphthalate	1.00E-01	1000	-	-
Dibenzo(a,h)anthracene	-	-	-	-
Diethyl phthalate	8.00E-01	1000	-	-
Di-n-octylphthalate	2.00E-02 (2)	1000	-	-
4-Chloro-3-methylphenol	-	-	-	-
1,2-Dichlorobenzene	9.00E-02	1000	5.70E-02 (3)	1000
1,4-Dichlorobenzene	-	-	2.00E-01 (2)	100
2,4-Dimethylphenol	2.00E-02	3000	-	-
Fluoranthene	4.00E-02	3000	-	-
Indeno(1,2,3-cd)pyrene	-	-	-	-
2-Methylnaphthalene	-	-	-	-
4-Methylnaphthalene	-	-	-	-
2-Methylphenol	5.00E-02	1000	-	-
4-Methylphenol	5.00E-03	1000	-	-
N-Nitrosodiphenylamine	-	-	-	-
Naphthalene	4.00E-02 (2)	1000	-	-
Nitrobenzene	5.00E-04	10000	5.70E-04 (3)	10010
Phenanthrene	-	-	-	-
Phenol	5.00E-01	100	-	-
Pyrene	3.00E-02	3000	-	-
Pesticides/PCBs				
Aldrin	3.00E-05	1000	-	-
Alpha-BHC	-	-	-	-
Beta-BHC	-	-	-	-
Delta-BHC	-	-	-	-
Gamma-BHC	3.00E-04	1000	-	-
Alpha-Chlordane	6.00E-05	1000	-	-
Gamma-Chlordane	6.00E-05	1000	-	-
4,4'-DDD	-	-	-	-
4,4'-DDE	-	-	-	-
4,4'-DDT	5.00E-04	100	-	-
Dieldrin	5.00E-05	100	-	-
Endosulfan	6.00E-05	3000	-	-
Endrin	3.00E-04	100	-	-
Endrin Aldehyde	-	-	-	-
Heptachlor	5.00E-04	300	-	-
Heptachlor Epoxide	1.30E-05	1000	-	-
Methoxychlor	5.00E-03	1000	-	-
PCBs (Aroclors)	-	-	-	-

PAS OSWEGO SITE
CHRONIC TOXICITY VALUES FOR POTENTIAL NONCARCINOGENIC HEALTH EFFECTS
DOSE - RESPONSE RELATIONSHIP (1)

TABLE 6 (Cont'd)

CHEMICALS	NONCARCINOGENS: REFERENCE DOSES/CONCENTRATIONS (RfD, RfC)			
	Oral RfD (mg/kg/day)	Uncertainty Factor	Inhalation RfC (mg/kg/day)	Uncertainty Factor
Inorganics				
Arsenic	3.00E-04	3	-	-
Barium	7.00E-02	3	1.40E-04 (3)	1000
Beryllium	5.00E-03	100	-	-
Cadmium (food)	1.00E-03	10	-	-
Cadmium (water)	5.00E-04	10	-	-
Chromium III (insol. salt)	1.00E+00	100	-	-
Chromium VI (insol. salt)	5.00E-03	500	-	-
Cobalt	-	-	-	-
Copper	1.3 mg/l* (2)	-	-	-
Lead (and compounds-inorg.)	-	-	-	-
Manganese (food)	1.40E-01	1	1.10E-04	300
Manganese (water)	5.00E-03	1	1.10E-04	300
Mercury (inorganic)	3.00E-04 (2)	1000	8.60E-05 (2)	30
Nickel (sol. salt)	2.00E-02	300	-	-
Nickel (refinery dust)	-	-	-	-
Vanadium	7.00E-03 (2)	100	-	-
Zinc (and compounds)	3.00E-01	3	-	-
Cyanide (free)	2.00E-02	100	-	-

NOTES:

- Aluminum, calcium, iron, magnesium, potassium and sodium are considered essential nutrients and will not be quantitatively evaluated in the risk assessment.
- The inorganics lead and copper cannot be quantitatively evaluated due to insufficient toxicity data.

* Current drinking water standard of 1.3 mg/l DWCD (1987) concluded toxicity data were inadequate for calculation of an RfD for copper.

(1) All toxicity values obtained from IRIS (on-line October 30, November 2-11, 1992, April 12, 1993) unless otherwise noted.
(2) Toxicity values obtained from HEAST Annual FY-1992.
(3) Toxicity values obtained from HEAST Annual FY-1992: Toxicity values are found in Agency documents but were calculated by alternative methods not currently practiced by the RfD/RfC Work Group.
(4) Toxicity value obtained from Superfund Health Technical Support Center December 7, 1992

TABLE 6 (Cont'd)

PAS OSWEGO SITE
SUBCHRONIC TOXICITY VALUES FOR POTENTIAL NONCARCINOGENIC HEALTH EFFECTS
DOSE - RESPONSE RELATIONSHIP (1)

NONCARCINOGENS: SUBCHRONIC REFERENCE DOSES (RfDs) AND REFERENCE CONCENTRATIONS (RfCs)

CHEMICALS	Oral RfD (mg/kg-day)	Uncertainty Factor	Inhalation RfC (mg/kg-day)	Uncertainty Factor
Volatile Organics				
Benzene	-	-	-	-
1,2-Dichloroethene (mixed)	9.00E-03	100	-	-
Ethylbenzene	1.00E+00	100	2.90E-01	300
Toluene	2.00E+00	100	5.70E-01	100
1,1,1-Trichloroethane	9.00E-01	100	2.90E+00 (2)	100
Trichloroethene	-	-	-	-
Vinyl Chloride	-	-	-	-
Semivolatile Organics				
Benzo(a)pyrene	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-
Bis(2-ethylhexyl)phthalate	2.00E-02	1000	-	-
2,4-Dimethylphenol	2.00E-01	300	-	-
4-Methylphenol	-	-	-	-
Pesticides/PCBs				
Aldrin	3.00E-05	1000	-	-
beta-BHC	-	-	-	-
Chlordane (3)	6.00E-05	1000	-	-
Dieldrin	5.00E-05	100	-	-
Heptachlor Epoxide	1.30E-05	1000	-	-
PCBs (Aroclors) (4)	-	-	-	-
Inorganics				
Arsenic	3.00E-04	3	-	-
Barium	7.00E-02	3	1.40E-03 (2)	100
Beryllium	5.00E-03	100	-	-
Cadmium	-	-	-	-
Chromium VI (insol. salt)	2.00E-02	100	-	-
Manganese	1.00E-01	1	1.10E-04	300
Nickel	2.00E-02	300	-	-
Vanadium	7.00E-03	100	-	-
Zinc (metallic)	2.00E-01	10	-	-
Cyanide (free)	2.00E-02	500	-	-

NONCARCINOGENS: SUBCHRONIC REFERENCE DOSES (RfDs) AND REFERENCE CONCENTRATIONS (RfCs)

NOTES:
- Aluminum, calcium, iron, magnesium, potassium and sodium are considered essential nutrients and will not be quantitatively evaluated in the risk assessment.
- The inorganics lead and copper cannot be quantitatively evaluated due to insufficient toxicity data.
- All inhalation RfCs were converted from mg/m3 to mg/kg/day using the formula presented in HEAST Annual FY-1992.

(1) Toxicity values obtained from HEAST Annual FY-1992.
(2) Toxicity values obtained from HEAST Annual FY-1992: Toxicity values are found in Agency documents but were calculated by alternative methods not currently practiced by the RfD/RfC Work Group.
(3) The toxicity value for chlordane was used for the alpha-chlordane isomer.
(4) All Aroclors detected at the site were assigned the toxicity values for Aroclor-1260.

EPA WEIGHT OF EVIDENCE:
A - Human Carcinogen
B1 - Probable Human Carcinogen. Limited human data are available.
B2 - Probable Human Carcinogen. Sufficient evidence of carcinogenicity in animals and inadequate or no evidence in humans.
C - Possible Human Carcinogen
D - Not Classifiable as to human carcinogenicity.
E - Evidence of noncarcinogenicity for humans.

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PAS OSWEGO SITE
COMBINING NONCARCINOGENIC HAZARD INDICES ACHOSS PATHWAYS

TABLE 7

MEDIA	RECEPTOR POPULATION	EXPOSURE ROUTE	INDIVIDUAL HAZARD INDEX	CHEMICAL CONTRIBUTING THE GREATEST AMOUNT TO HAZARD INDICES
GROUNDWATER-OVERBURDEN	Resident:			
	Adults	Ingestion	NA	--
		Inhalation (Shower model)	NA	--
		Total Hazard Index =	NA	--
	Children	Ingestion	NA	--
		Inhalation (Shower model)	NA	--
		Total Hazard Index =	NA	--
GROUNDWATER-BEDROCK	Resident:			
	Adults	Ingestion	26	Arsenic, Manganese
		Inhalation (Shower model)	NA	--
		Total Hazard Index =	26**	Arsenic, Manganese
	Children	Ingestion	15	Arsenic, Barium, Manganese
		Inhalation (Shower model)	NA	--
		Total Hazard Index =	15**	Arsenic, Barium, Manganese
SURFACE WATER, SEDIMENT, AND FISH INGESTION	Resident:			
	Adults	Ingestion (Surface Water)	7.3E-03	--
		Dermal Contact (Surface Water)	4.5E-04	--
		Ingestion (Sediment)	2.2E-02	--
		Dermal Contact (Sediment)	1.8E-04	--
		Ingestion (Fish)	3.0E-01	--
		Total Hazard Index =	0.33	--
	Children	Ingestion (Surface Water)	8.4E-03	--
		Dermal Contact (Surface Water)	2.6E-04	--
		Ingestion (Sediment)	2.0E-01	--
		Dermal Contact (Sediment)	NA	--
		Ingestion (Fish)	1.5	Dieldrin, Manganese
		Total Hazard Index =	1.7**	Dieldrin, Manganese
SUBSURFACE SOIL	Construction/ Utility Workers	Ingestion	1.2E-01	--
		Dermal Contact	NA	--
		Inhalation	3.6E-02	--
		Total Hazard Index =	0.16	--

Notes

* Indicates that the total carcinogenic risk exceeds 1.0E-06.

** Indicates that the *total hazard* index exceeds 1.

-- Indicates that the carcinogenic risk or noncarcinogenic hazard index does not exceed target values; *therefore*, no chemicals were selected as contributors.

NA: The total hazard index could not be *calculated for residents* as only carcinogenic VOCs were detected in overburden wells.

: The *total hazard* index could not be calculated for residents as only carcinogenic VOCs and inorganics were detected in *bedrock wells*.

: The hazard index could not be calculated for child dermal contact *with sediment as no subchronic* toxicity value was available for cadmium.

: The hazard index *for construction/utility* worker dermal contact with subsurface soil could not be calculated as Aroclors do not have *noncarcinogenic toxicity values*.

TABLE 8

SUMMARY OF ECOTOXICITY VALUES
REPORTED IN THE LITERATURE
PAS SITE, Oswego, New York

RECEPTOR	REPORTED VALUES (1)				
	ALDRIN	ALUMINUM	BARIUM	BENZENE	BENZOIC ACID
MINK	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
SHORTTAIL SHREW	Data Not Available	Data Not Available	Data Not Available	Data Not Available	1. Oral LD 50 of 3.1 g/kg body weight in rats
GREEN HERON	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
SPRING PEEPER	Data Not Available	1. LC 50 of 471 ug/l at pH 4.8 for leopard frog. 2. LC 50 of 627 ug/l at pH 4.5 for bullfrog larvae 3. Significant toxicity to pine barrens tree frog at 0.2 mg/l at pH 4.4	Data Not Available	Data Not Available	Data Not Available
FATHEAD MINNOW	1. Acute LC 50 of 32.37 ug/l for fathead minnow. 2. Chronic LC 50 of 0.22 for rainbow trout.	1. Acute LC 50 of 35,000 ug/l for juvenile fathead minnow 2. Reduced weight in chronic exposures of 2,300 ug/l to fathead minnow	Data Not Available	1. Acute LC 50 of 33,000 ug/l for fathead minnow	Data Not Available
AQUATIC INVERTEBRATES	1. Chronic LC 50 of 57 ug/l for Daphnia magna	1. Acute LC 50 of 1,900 ug/l for Ceriodaphnia dubia	Data Not Available	1. Acute LC 50 of 203,000 ug/l for Daphnia magna.	Data Not Available
PAS SITE COCS (Maximum detected values)	SED - 730 ug/kg	SW - 328 ug/l	SED - 2470 mg/kg	SED - 0.09 ug/kg	SED - 120 ug/kg

RECEPTOR	REPORTED VALUES (1)				
	BENZYL ALCOHOL	BIS(2-ETHYLHEXYL) PHTHALATE	DELTA-BHC	2 BUTANONE	CADMIUM
MINK	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
SHORTTAIL SHREW	1. Oral LD 50 of 3.1 g/kg body weight in rats.	1. LD 50 of 31 g/kg body weight in rats. 2. Cancerous tumors in rats/mice when fed 12,000/6,000 ppm.	Data Not Available	1. Oral LD 50 OF 2,750 ug/kg body weight for rats.	Data Not Available
GREEN HERON	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
SPRING PEEPER	Data Not Available	Data Not Available	Data Not Available	Data Not Available	
FATHEAD MINNOW	Data Not Available	1. Chronic LC 50 of 5 - 14 ug/l for early life stage rainbow trout.	1. Acute LC 50 of 13,000 and 15,000 ug/l for fathead minnow. (mixture of BHCs).	1. Acute LC 50 of 5,600 ug/l for freshwater fish.	1. Acute LC 50 of 30.5 ug/l for fathead minnow. 2. Chronic LC 50 of 45.92 ug/l for fathead minnow (201 mg/kg calcium carbonate).
AQUATIC INVERTEBRATES	Data Not Available	1. Reproductive impairment in chronic exposure to 3 ug/l for Daphnia magna.	1. Acute LC 50 of 3,150 ug/l for freshwater worms. (mixture of BHC isomers).	Data Not Available	1. Acute LC 50 of less than 39.300 ug/l 2. Chronic toxicity values range from 0.12 to 6.3 ug/l
PAS SITE COCS (Maximum detected values)	SED - 32 ug/kg	SED - 790 ug/kg	SED - 0.46 ug/kg	SED - 27 ug/kg	SED - 3.1 mg/kg

TABLE 8 (Cont'd)

SUMMARY OF ECOTOXICITY VALUES
REPORTED IN THE LITERATURE
PAS SITE, Oswego New York

RECEPTOR	REPORTED VALUES (1) CHROMIUM	CALCIUM	COBALT	COPPER	CYANIDE
MINK	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
SHORTTAIL SHREW	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
GREEN HERON	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
SPRING PEEPER	1. 100 % mortality in Rana pipiens tadpoles after 72 hour exposure to 2 ug/l.	Data Not Available	Data Not Available	1. 72 hour LC 50 of 150 ug/l for Rana pipiens. 2. Mortality of Bufo boreas tadpoles at 20 to 44 ug/l. 3. 30-day LC 50 for adult Rana pipiens and Xenopus laevis at 1,500 and 1,800 ug/l.	Data Not Available
FATHEAD MINNOW	1. Acute LC 50 of 41,050 ug/l for chromium (VI) and 10,320 ug/l for chromium (III) in fathead minnow. 2. Chronic LC 50 of 1,987 ug/l for chromium (VI) for fathead minnow.	Data Not Available	Data Not Available	1. Acute LC 50 of 115.5 ug/l for fathead minnow. 2. Chronic LC 50 of 24.32 ug/l for fathead minnow (200 mg/l calium carbonate).	1. Acute LC 50 of 125.1 ug/l for fathead minnow 2. Chronic LC 50 of 15.39 for fathead minnow
AQUATIC INVERTEBRATES	1. Acute LC 50 of 23.07 ug/l for a cladoceran species.	Data Not Available	Data Not Available	1. Acute LC 50 of 10 ug/l for Daphnia magna. 2. Chronic LC 50 values range from about 7 to 30.51 ug/l.	1. Acute LC 50 range from 83 to 2,490 ug/l for freshwater invertebrates 2. Chronic LC 50 range from 16 to 4[illegible] ug/l for freshwater invertebrates
PAS SITE COCS (Maximum detected values)	SED - 42.5 mg/kg	SED - 20,500 mg/kg	SED - 10.0 mg/kg	SW - 5 ug/l SED - 89.9 mg/kg	SW - 12 ug/l

RECEPTOR	REPORTED VALUES (1) DDT,DDE	DIETHYLPHTHALATE	GAMMA CHLORDANE
MINK	Data Not Available	Data Not Available	Data Not Available
SHORTTAIL SHREW	Data Not Available	Data Not Available	Data Not Available
GREEN HERON	1. Impaired reproduction of Japanese quail fed a diet of 300 mg DDT/kg body weight. No eggs laid when fed 700 mg/kg.	Data Not Available	1. LD 50 of 14.1 mg/kg body weight for California quail. 2. 57-day LD 50 of 1.5 mg/kg diet for european starling.
SPRING PEEPER	1. Acute LC 50 of 7.5 mg/kg body weight.	Data Not Available	1. Acute LC 50 of 2 ug/l for common toad.
FATHEAD MINNOW	1. Acute LC 50 of 48 ug/l for fathead minnow. 2. Chronic LC 50 of 0.74 ug/l for fathead minnow.	1. Acute LC 50 of 98,000 ug/l for bluegill.	1. Acute LC 50 of 37 ug/l for fathead minnow.
AQUATIC INVERTEBRATES	1. Acute LC 50 of 2.4 ug/l for Daphnia magna.	1. Acute LC 50 of 52,100 ug/l for Daphnia magna	1. Acute LC 50 values range from 3 to 190 ug/l. 2. Chronic LC 50 o[illegible]16 ug/l for a cladoceran species.
PAS SITE COCS (Maximum detected values)	SW - DDT 0.0029 ug/l, DDE 0.0047 ug/l SED - DDT 74 ug/kg, DDE 41 ug/kg	SED - 48 ug/kg	SED - 0.76 ug/kg

TABLE 8 (Cont'd)

SUMMARY OF ECOTOXICITY VALUES
REPORTED IN THE LITERATURE
PAS SITE (Oswego, New York)

RECEPTOR	REPORTED VALUES (1)				
	HEPTACHLOR EPOXIDE	MAGNESIUM	4-METHYLPHENOL	NICKEL	NITROBENZENE
MINK	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
SHORTTAIL SHREW	Data Not Available	Data Not Available	Data Not Available	Data Not Available	1. Oral LD 50 of 640 mg/kg body weight for rats
GREEN HERON	Data Not Available	Data Not Available	Data Not Available	1. 92% mortality over a 30-day period when mallard ducklings were fed a diet of 1,200 mg/kg body weight.	Data Not Available
SPRING PEEPER	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
FATHEAD MINNOW	1. Acute LC 50 values for freshwater fish from 5.3 to 120 ug/l.	Data Not Available	1. 24-hour median threshold limit of 7 mg/l for trout embryos. 2. 24-hour and 96-hour median threshold limits of approximately 11.9 mg/l for bluegill.	1. Acute LC 50 of 3,027 ug/l for fathead minnow. 2. Chronic LC 50 of 528.7 ug/l for fathead minnow.	1. Median threshold limit of 20 - 24 mg/l per 6-hour period in distilled water and 90 - 100 mg/l per 6-hour in hard water.
AQUATIC INVERTEBRATES	1. Acute LC 50 values for freshwater invertebrates from 120 ug/l to greater than 10,000 ug/l.	Data Not Available	Data Not Available	1. Acute LC 50 of 554.4 ug/l for Daphnia magna. 2. Chronic LC 50 of 14.77 ug/l for Daphnia magna in soft water	1. Acute LC 50 of 60 mg/l for a Daphnia species
PAS SITE COCS (Maximum detected values)	SED - 35 ug/kg	SED - 8,960 mg/kg	SED - 110 ug/kg	SED - 38.1 mg/kg	SED - 40 ug/kg

RECEPTOR	REPORTED VALUES (1)				
	N-NITROSODIPHENYLAMINE	PCBs	PAHs	PHENOL	SODIUM
MINK	Data Not Available	1. Diet of 0.64 mg/kg Aroclor 1254 reduced reproduction. 2. Diet of 0.1 mg/kg Aroclor 1254, mortality was reported.	Data Not Available	Data Not Available Data Not Available	Data Not Available Data Not Available
SHORTTAIL SHREW	1. Rats fed diets of 1,000 mg/kg for 100 weeks produced urinary bladder cancer.	Data Not Available	Data Not Available	Data Not Available	Data Not Available
GREEN HERON	Data Not Available	1. Mortality in sensitive bird species with diet of 200 mg/kg over several days. 2. Extensive mortality in sensitive bird species and some mortality in other bird species with diet of 1,500 mg/kg. 3. Reduced sperm counts in American kestrel fed 3-10 mg/kg body weight for 62-68 days.	Data Not Available	Data Not Available	Data Not Available
SPRING PEEPER	Data Not Available	Data Not Available	Data Not Available	Data Not Available	Data Not Available
FATHEAD MINNOW	1. Acute LC 50 of 5,850 ug/l for bluegill.	1. Acute LC 50 of 7.7 ug/l for fathead minnow. 2. Chronic LC 50 values of 0.2 to 2.3 ug/l for fathead minnow.	1. 65-hour LC 50 of 1.3 ug/l for fathead minnow for benzo(a) anthracene. 2. 80% mortality in bluegill exposed to benzo(a)pyrene.	1. Acute LC 50 of 38,000 ug/l for fathead minnow. 2. Chronic LC 50 of 2,560 ug/l for fathead minnow.	
AQUATIC INVERTEBRATES	1. Acute LC 50 of 7,760 ug/l for Daphnia magna.	1. Acute LC 50 of 29 ug/l for a scud species. 2. Chronic LC 50 of 4.3 ug/l for Daphnia magna.	1. One-hour LC 50 of 4 ug pyrene/l for Daphnia magna. 2. 24-hour LC 50 of 0.7 ug/l benzo(a)pyrene for Daphnia magna. 3. 24-hour LC 50 values for fluoranthene from 1,000,000 ug/l.	1. Acute LC 50 values ofrom 18,000 to 248,000 ug/l for freshwater invertebrates.	Data Not Available
PAS SITE COCS (Maximum detected values)	SED - 590 ug/kg	SED - Aroclor 1248: 1,900 ug/kg, Aroclor 1254: 5,500 ug/kg Aroclor 1260: 1,300 ug/kg	SED - (others in text) benzo(a)anthracene: 1,400 ug/kg benzo(a)pyrene: 1,200 ug/kg fluoranthene: 2,000 ug/kg pyrene 2,500 ug/kg	SED - 51 ug/kg	SED - 3,590 mg/kg

SUMMARY OF ECOTOXICITY VALUES
REPORTED IN THE LITERATURE
PAS SITE, Oswego, New York

RECEPTOR	REPORTED VALUES (1)		
	1,1,1-TRICHLOROETHANE	TOLUENE	VANADIUM
MINK	Data Not Available	Data Not Available	Data Not Available
SHORTTAIL SHREW	Data Not Available	1. Death of mice reported at 10,000 mg/kg body weight.	1. Oral LD 50 of 23 and 130 mg/kg body weight for various forms of vanadium in
GREEN HERON	Data Not Available	Data Not Available	Data Not Available
SPRING PEEPER	Data Not Available	Data Not Available	Data Not Available
FATHEAD MINNOW	1. Acute LC 50 for aquatic organisms as low as 18,000 ug/l	1. Acute LC 50 of 34,270 ug/l for fathead minnow	1. 96 hour LC 50 values for freshwater fish from 5,000 to 100,000 ug/l
AQUATIC INVERTEBRATES	1. Acute LC 50 for aquatic organisms as low as 18,000 ug/l.	1. 48-hour EC 50 values for Daphnia magna from 60,000 to 313,000 ug/l	1. 96 hour LC 50 values for Daphnia spp. less than 0.16 ug/l
PAS SITE COCS (Maximum detected values)	SED - 0.4 ug/kg	SED - 1 ug/kg	SED - 47.7 ug/kg

(1) - Refer to text for reference citations.

EC 50 denotes effective concentration 50.
LC 50 denotes lethal concentration 50.
LD 50 denotes lethal dose 50
SED denotes sediment
Sw denotes surface water.

TABLE 8 (Cont'd)

APPENDIX III

ADMINISTRATIVE RECORD INDEX

POLLUTION ABATEMENT SERVICES SITE
OPERABLE UNIT TWO
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

1.0 SITE IDENTIFICATION

1.3 Preliminary Assessment Reports

p. 100001-100169 Report: Engineering Investigations at Inactive Hazardous Waste Sites, Preliminary Site Assessment, Niagara Mohawk Fire Training School, SITE No. 738030, prepared for NYSDEC, prepared by URS Consultants, Inc., October 1991.

p. 100170-100414 Report: Engineering Investigations at Inactive Hazardous Waste Sites, Phase I Investigation, East Seneca Street Dump, SITE No. 738027, prepared for NYSDEC, prepared by URS Company, Inc., September 1989.

1.4 Site Investigation Reports

p. 100415-100701 Report: Engineering Investigations at Inactive Hazardous Waste Sites, Phase II Investigation, East Seneca Street Dump, SITE No. 738027, prepared for NYSDEC, prepared by URS Consultants, Inc., June 1992.

3.0 REMEDIAL INVESTIGATION

3.1 Sampling and Analysis Plans

p. 300001-300010 Report: Addendum to the Field Operations Plan Supplemental Remedial Investigation and Feasibility Study, Pollution Abatement Services Site, Oswego, New York, prepared by Geraghty & Miller, Inc. Environmental Services, January 29, 1992, (revised March 5, 1992).

p. 300011-300630 Report: Field Operations Plan Supplemental Remedial Investigation and Feasibility Study, Pollution Abatement Services Site, Oswego, New York, prepared by Geraghty & Miller, Inc. Environmental Services, May 1991.

3.2 Sampling and Analysis Data/Chain of Custody Forms

p.	300631-300654	Letter to Mr. Richard Ramon, P.E., Remedial Project Manager, Western New York Superfund Section I, U.S. Environmental Protection Agency Region II, from Mr. Richard Eby, Project Scientist, Geraghty & Miller, Ms. Laine Vignona, Principal Scientist, Geraghty & Miller, Inc., re: Leachate Collection System Pumping Test Data, Pollution Abatement Services Site, Oswego, New York, June 21, 1991, Tables and Figures attached.
p.	300655-300972	Report: Supplemental Remedial Investigation Analytical Data Tables and Contract Laboratory Program Data Validation Standard Operation Procedure Format For USEPA Region II Pollution Abatement Services Site, Oswego, New York, prepared by Geraghty & Miller, Inc., June 2, 1992.
p.	300973-301344	Report: Supplemental Remedial Investigation Analytical Data Tables and Contract Laboratory Program Data Validation Standard Operation Procedure Format for USEPA Region II Pollution Abatement Services Site, Oswego, New York, Volume I, prepared by Geraghty & Miller, Inc., February 6, 1992.
p.	301345-301554	Report: Supplemental Remedial Investigation Analytical Data Tables and Contract Laboratory Program Data Validation Standard Operation Procedure Format for USEPA Region II Pollution Abatement Services Site, Oswego, New York, Volume II, prepared by Geraghty & Miller, Inc., February 6, 1992.
p.	301555-301600	Report: Data Validation Tables, prepared by Geraghty & Miller, Inc., (undated).

3.3 Work Plan

p.	301601-301661	Report: Final Work Plan, Oversight of Supplementary RI/FS for the Pollution Abatement Services Site, Oswego, New York, prepared by TAMS Consultants, Inc., June 1991.
p.	301662-301715	Report: Revised Work Plan for Supplemental Remedial Investigation and Feasibility Study, Pollution Abatement Services Site, Oswego, New York, Volumes I & II, prepared by the USEPA, March 21, 1990, revised by Geraghty & Miller, Inc., September 1990.

p. 301716-301776 Report: Final Supplemental Remedial Investigation Work Plan for Pollution Abatement Services Site, Oswego, New York, Volume II, prepared by TAMS Consultants, Inc., March 1990.

3.4 Remedial Investigation Reports

P. 301777-302351 Report: Final Supplemental Remedial Investigation Report, Pollution Abatement Services Site, Oswego, New York, prepared by Golder Associates, August 1993.

p. 302352-302480 Report: Report on Field Oversight of Supplemental RI/FS for Pollution Abatement Services Site, Oswego, New York, prepared by TAMS Consultants, Inc., May 1993.

p. 302481-302693 Report: Draft Site Summary Report Pollution Abatement Services Site, Oswego, New York, Volume I of II, prepared by Geraghty & Miller, Inc., August 1992.

p. 302694-302867 Report: Draft Site Summary Report Pollution Abatement Services Site, Oswego, New York, Volume II of II, prepared by Geraghty & Miller, Inc., August 1992.

p. 302868-302883 Report: Addendum I, Summary of the East Seneca Street Dump's Phase I and II Investigation and the Niagara Mohawk Fire Training School's Preliminary Site Assessment, addendum to Draft Site Summary Report, prepared by Geraghty & Miller, Inc., August 1992.

p. 302884-303026 Report: Site Investigations and Remedial Alternative Evaluations at the Pollution Abatement Services (PAS) Site in Oswego, New York, FINAL REPORT, prepared by URS Company, Inc., January 1984, Revised 1985.

3.5 Correspondence

p.	303027-303083	Letter to Mr. Richard Ramon, P.E., Project Coordinator, Western New York Remedial Action Section, New York/Caribbean Remedial Action Branch, Emergency and Remedial Response Division, United States Environmental Protection Agency, from Mr. Robert J. Mozer, Senior Associate, Geraghty & Miller Inc., re: Submittal of Responses to Comments on the Draft Site Summary Report PAS Oswego - Supplemental Remedial Investigation/ Feasibility Study, November 24, 1992. Enclosed Report: Responses to USEPA/NYSDEC Comments.
p.	303084-303092	Letter to Mr. Mark Valentine, Project Manager, de Maximus Inc., from Richard Ramon, P.E., Project Manager, Western New York Superfund Section I, re: the EPA review of the Site Summary Report for Pollution Abatement Services submitted by Geraghty & Miller Inc., October 29, 1992.
p.	303093-303093	Letter to Mr. Mark Valentine, Project Manager, de Maximus, Inc., from Mr. Richard Ramon, P.E., Project Manager, Western New York Superfund Section I, re: Geraghty & Miller's initial data validation, September 23, 1992.
p.	303094-303095	Letter to Mr. Richard Ramon, P.E., Project Manager, Western New York Remedial Action Section, New York/ Caribbean Remedial Action Branch, Emergency and Remedial Response Division, United States Environmental Protection Agency from Ms. Laine Vignona, Principal Scientist/Project Manager, Geraghty & Miller, Inc., re: EPA Region II Data Validation Standard Operating Procedures; Pollution Abatement Services Site, Oswego, New York, November 6, 1991.
p.	303096-303096	Letter to Ms. Laine Vignona, Principal Scientist/ Project Manager, Geraghty & Miller, Inc. Environmental Services from Mr. Richard Ramon, P.E., Project Manager, Western New York Superfund Section I, re: letter of August 29, 1991 requesting approval to shift soil boring locations, August 30, 1991.

p.	303097-303098	Letter to Mr. Mark Valentine, Project Manager, de Maximus, Inc., from Mr. Richard Ramon, P.E., Project Manager, Western New York Superfund Section I, re: follow-up of conference calls on August 13, and 14 regarding the scope of work for the Ecological Assessment at the Pollution Abatement Services site, August 26, 1991.
p.	303099-303100	Letter to Mr. Mark Valentine, Project Manager, de Maximus, Inc., from Mr. Richard Ramon, P.E., Project Manager, Western New York Superfund Section I, re: follow-up to letter of June 24 1991, and conference call of August 2, 1991 regarding comments from NYSDEC concerning Tentatively Identified Compounds (TICs), August 8, 1991.
p.	303101-303101	Letter to Mr. Mark Valentine, Project Manager, de Maximus, Inc., from Mr. Richard Ramon, P.E., Project Manager, Western New York Superfund Section I, re: revised Field Operations Plan for the Pollution Abatement Services (PAS) site submitted by Geraghty & Miller, Inc. in May 1991, June 24, 1991.
p.	303102-303104	Letter to Mr. Richard Ramon, P.E., Project Coordinator, Western New York Remedial Action Branch, U.S. Environmental Protection Agency, from Mr. Robert J. McNamee, Senior Engineering Geologist, Bureau of Central Remedial Action, Division of Hazardous Waste Remediation, re: Pollution Abatement Services Site Revised Field Operations Plan for Supplemental RI/FS, Site Code: 7-38-001, June 19, 1991.
p.	303105-303106	Letter to Ms. Laine Vignona, Senior Scientist, Geraghty & Miller, Inc., from Robert J. McNamee, Senior Engineering Geologist, Bureau of Central Remedial Action, Division of Hazardous Waste Remediation, re: Pollution Abatement Services Site, Oswego, New York, Site Code: 7-38-001, concerning eleven groundwater monitoring wells abandoned at PAS, May 13, 1991.
p.	303107-303111	Letter to Mr. Mark Valentine, Project Manager, de Maximus, Inc. from Mr. Richard Ramon, P.E., Remedial Project Manager, Western New York Superfund Section I, re: follow-up of February 28, 1991 and conference call of March 15, 1991 regarding the draft Field Operations Plan (FOP) for the Pollution Abatement Services (PAS) site, April 3, 1991.
p.	303112-303116	Letter to Mr. Richard Ramon, P.E., Project Coordinator, Western New York Remedial Action Branch, U.S. Environmental Protection Agency, from Mr. Robert J. McNamee,

Senior Engineering Geologist, Bureau of Central Remedial Action, Division of Hazardous Waste Remediation, re: Pollution Abatement Services Site, Field Operations Plan for Supplemental RI/FS, Site Code: 7-38-001, resubmission of comments generated by State of New York regarding the Field Operations Plan, March 22, 1991.

p. 303117-303118 Letter to Mr. Mark Valentine, Project Manager, de Maximus, Inc., from Mr. Richard Ramon, P.E., Project Manager, Western New York Superfund Section I, re: February 22, 1991 meeting regarding the draft Field Operations Plan (FOP) for the Pollution Abatement Services Site (PAS) site, February 28, 1991.

p. 303119-303119 Letter to Mr. Joel Singerman, Chief, Western New York Remedial Action Section, U.S. Environmental Protection Agency, from Mr. Raymond E. Lupe, P.E., Chief Central Remedial Projects Section, Bureau of Central Remedial Action, Division of Hazardous Waste Remediation, re: Pollution Abatement Services Site Supplemental RI/FS Site Code 7-38-001 prepared by Geraghty & Miller Inc., notification that comments to the EPA will not be available until January 15, 1991, December 13, 1990.

p. 303120-303122 Letter to Mr. Joel Singerman, New York/Caribbean Remedial Action Branch, U.S. Environmental Protection Agency, from Mr. R. Bruce Fidler, Site Manager, TAMS Consultants, Inc., re: Pollution Abatement Services (PAS) Site, SRI/FS Work Plan, regarding TAMS' response to revisions to the SRI/FS Work Plan (Volumes I and II) proposed by Geraghty & Miller Inc., in letter of August 2, 1990, August 16, 1990.

p. 303123-303124 Letter to Mr. Joel Singerman, New York/Caribbean Remedial Action Branch, U.S. Environmental Protection Agency, from Ms. Laine Vignona, Senior Scientist, Thomas Lobasso, Senior Associate, Geraghty & Miller, Inc., re: Pollution Abatement Services (PAS), Oswego, New York, Revised Supplemental Remedial Investigation/Feasibility Study (SRI/FS) Work Plan, August 2, 1990.

p. 303125-303126 Letter to Mr. Joel Singerman, Chief, Western New York Remedial Section, U.S. Environmental Protection Agency Region II, from Mr. Raymond E. Lupe, Chief, Central Remedial Projects Section, Bureau of Eastern Remedial Action, Division of Hazardous Waste Remediation, re: Pollution Abatement Services (7-38-001), Oswego County, comments from the Division of Water, Division of Fish and Wildlife, and Division of Hazardous Waste

Remediation on the Draft Field Operations Plan (FOP), April 10, 1990.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

p. 400001-400332 Report: Final Supplemental Feasibility Study Report, Pollution Abatement Services Site, Oswego, New York, prepared by Golder Associates, August 1993.

5.0 RECORD OF DECISION

5.1 Record of Decision

p. 500001-500044 Record of Decision, Remedial Alternative Selection for Pollution Abatement Services, Inc. (PAS), Oswego, New York, June 6, 1984.

7.0 ENFORCEMENT

7.2 Endangerment Assessments

p. 700001-700421 Report: Final Endangerment Assessment, PAS Oswego Site, Oswego, New York, Volume I of II, prepared by CDM Federal Programs Corporation, May 26, 1993.

p. 700422-700536 Report: Final Endangerment Assessment, PAS Oswego Site, Oswego, New York, Volume II of II, prepared by CDM Federal Programs Corporation, May 26, 1993.

7.3 Administrative Orders

p. 700537-700638 Removal Order, Index No. 10221, Constantine Sidamon-Eristoff, Regional Administrator, September 30, 1991.

p. 700639-700748 Administrative Order on Consent for Supplemental Remedial Investigation/Feasibility Study, Index No. II CERCLA-00214, Constantine Sidamon-Eristoff, Regional Administrator, September 27,

1990.

7.7 Notice Letters and Responses - 104e's

p. 700749-700751 Letter re: General Notice for the Supplementary Remedial Investigation and Feasibility Study at the Pollution Abatement Services Site, Oswego County, New York, March 23, 1990.

7.8 Correspondence

p. 700752-700754 Letter to Chief, Western New York Remedial Action Section, New York/Caribbean Remedial Action Branch, Emergency and Remedial Response Division, U.S. Environmental Protection Agency, Attn: PAS Oswego Site Manager, from James W. Moorman on behalf of the PAS Management Committee (for Respondents) re: Pollution Abatement Services Sites, Oswego, New York, Administrative Order on Consent for PAS Oswego Site Interim Groundwater Removal, October 4, 1991.

p. 700755-700755 Letter to James W. Moorman, Esq., Cadwalder, Wickersham, and Taft, from Joel Singerman, Chief, Western New York Remedial Action Section, re: March 16, 1990 telephone conversation concerning contamination detected outside the slurry wall at the Pollution Abatement Services Superfund site, March 21, 1990.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P. 1000001-1000013 Plan: Superfund Proposed Plan for the Pollution Abatement Services Site, Town of Oswego, Oswego County, New York, August 1993.

APPENDIX IV

STATE LETTER OF CONCURRENCE

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 1

To William McCabe	From Raymond Lupe
Co. USEPA	Co. NYSDEC
Dept.	Phone # 518-457-5677
Fax # 212-264-6192	Fax # 518-457-1072

New York State Department of Environmental C
50 Wolf Road, Albany, New York 12233 7010

Thomas C. Jorling
Commissioner

NOV 29 1993

Mr. William J. Muszynski, P.E.
Acting Regional Administrator
US Environmental Protection Agency
26 Federal Plaza - Region II
New York, NY 10278

Dear Mr. Muszynski:

RE: Pollution Abatement Services
Site No.: 7-38-001
Record of Decision

This letter is to advise you that the proposed change in language in the Record of Decision, Pollution Abatement Services Site, Oswego, New York, as outlined in the November 18, 1993 telex to the Division of Hazardous Waste Remediation staff is acceptable to the State. Page 6 of the Record of Decision, will now include:

> "Should the results of this investigation determine that bedrock pumping will be an effective means of addressing the contamination in the bedrock aquifer without adversely impacting the existing containment system or the creeks and wetlands, then an analysis to determine the rate and the location of the bedrock extraction wells will be performed, followed by implementation of the bedrock groundwater extraction and treatment. Should the investigation indicate that bedrock groundwater pumping will have a significant, adverse impact on the containment system or the creeks and wetlands, this decision will be documented in a pre-remedial design study report concurred upon by New York State."

The proposed change was discussed between Mr. Raymond Lupe (NYSDEC) and Mr. Gary Litwin (NYSDOH), and will satisfactorily resolve the concerns of the State outlined in my November 5, 1993 letter to you. Therefore, the State now concurs with the Record of Decision.

Please contact Mr. Michael J. O'Toole, Jr., Director, Division of Hazardous Waste Remediation at (518) 457-5861 if you have any questions.

Sincerely,

Ann Hill DeBarbieri
Deputy Commissioner
Office of Environmental Remediation

cc: A. Carlson, NYSDOH
W. McCabe, USEPA

NOV-05-1993 15:46 FROM NYS ENVIRONMENTAL CONSERVATION TO [illegible]

Post-it™ brand fax transmittal memo 7671 # of pages ▸ 3

To Bill McCabe	From Ray Lupe
Co. USEPA	Co. NYSDEC
Dept. 6192	Phone # (518) 457-5677
Fax # (212) 264-7644	Fax # (518) 457-1088

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233 7010

NOV 5 1993

Thomas C. Jorling
Commissioner

Mr. William J. Muszynski, P.E.
Acting Regional Administrator
US Environmental Protection Agency
26 Federal Plaza - Region II
New York, NY 10278

Dear Mr. Muszynski:

RE: Pollution Abatement Services
Site No.: 7-38-001
Record of Decision, Supplemental RI/FS

The purpose of this letter is to advise you that the revision of page 27 of the Record of Decision, Supplemental Remedial Investigation/Feasibility Study (RI/FS), Pollution Abatement Services Site, Oswego, NY, to include the following language is satisfactory to New York State:

> "Should the investigation indicate that bedrock groundwater pumping will have a significant, adverse impact on the containment system or the wetlands (which would be documented in a pre-remedial design study report), then, upon obtaining the concurrence of New York State, bedrock groundwater pumping will not be implemented[1]."

[1] "In accordance with CERCLA Section 117(c) and Section 300.435(c)(2)(i) of the NCP, if bedrock groundwater pumping is not implemented, then an Explanation of Significant Differences, describing the modification to the selected remedy and the basis for the change, will be published."

Discussions between Raymond Lupe (NYSDEC) and Gary Litwin (NYSDOH) on October 29, 1993 confirmed that the revision to the Record of Decision will adequately resolve the major concern of the New York State Department of Health outlined on page 2 of my October 5, 1993 concurrence letter to you. This concern was that:

> "The Declaration of the Record of Decision and the discussion of the selected remedy in the Record of Decision should include follow-up actions that will be pursued in the event that the results of hydrogeologic, pre-remedial design studies show that pumping the groundwater is not an effective means of remediating the contaminated water in the bedrock aquifer without adversely affecting the containment system or the adjacent wetlands and creeks."

The New York State Department of Environmental Conservation concurs with the Record of Decision upon incorporation of the revisions outlined above.

Thank you for the efforts of your staff to resolve this matter. Please contact Michael J. O'Toole, Jr., at (518) 457-5861 if you have any questions.

Sincerely,

Ann Hill DeBarbieri
Deputy Commissioner
Office of Environmental Remediation

cc: D. Munro, NYSDOL
A. Carlson, NYSDOH
G. Litwin, NYSDOH

APPENDIX V

RESPONSIVENESS SUMMARY

APPENDIX V

RESPONSIVENESS SUMMARY

Pollution Abatement Services Superfund Site

INTRODUCTION

A responsiveness summary is required by Superfund policy. It provides a summary of citizens' comments and concerns received during the public comment period, and the United States Environmental Protection Agency's (EPA's) and the New York State Department of Environmental Conservation's (NYSDEC's) responses to those comments and concerns. All comments summarized in this document have been considered in EPA's and NYSDEC's final decision for selection of a remedial alternative to augment the previously implemented remedial actions and to address the contamination detected outside the containment system at the Pollution Abatement Services site.

OVERVIEW

The public generally supports the preferred remedy, enhanced source control with bedrock extraction and treatment. However, there were some concerns that were expressed related to the preferred option for the treatment and disposal of the leachate and groundwater from the PAS site at the City of Oswego's wastewater treatment plant. The primary concerns were related to the wastewater treatment plant's ability to adequately treat the contaminated groundwater and leachate. It was explained at the public meeting that the identification of the City of Oswego's wastewater treatment plant as the preferred option for the treatment and disposal of the leachate and contaminated groundwater in no way obligates the City to accept the leachate and contaminated groundwater, nor does it imply that EPA and NYSDEC will ultimately approve the discharge. Assuming that all of the City's obligations related to the wastewater treatment plant are satisfied (such as the implementation of an Industrial Pretreatment Program) and that the City is willing to accept the discharge, EPA and NYSDEC approval of the subject discharge would be contingent upon a determination that the proposed discharge (with or without pretreatment) would not adversely impact the plant's treatment processes or sludge disposal practices and that it would not contribute to permit violations or cause water quality criteria in the receiving waters to be exceeded. In the event that this option cannot be implemented, the on-site treatment option would be implemented as a contingent option for treatment and disposal.

The potentially responsible parties (PRPs) expressed concerns relative to the reasonableness of a number of the exposure assumptions used in the human health risk evaluation and the applicability of a number of the comparisons made between the toxicological databases and scientific literature and the actual on-site case exposures that are occurring to non-human receptors. EPA, in its response, noted that the Agency adopts a conservative approach in its risk assessments. The values/criteria that are claimed to be unreasonable are standard default values that EPA uniformly applies at all sites. Hence, the computed risks represent

the reasonable maximum exposure case. With regard to the ecological threat, the levels of some constituents exceed those that are believed to be protective of 95% of aquatic life. Hence, continued exposure to the present contaminant levels are predicted to result in impacts either through direct exposure to the contaminated medium or through feeding on forms that have assimilated contamination from the water.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The RI report, FS report, and the Proposed Plan for the site were released to the public for comment on August 23, 1993. These documents were made available to the public in the administrative record file at the EPA Docket Room in Region II, New York and the information repository at the Oswego City Hall. The notice of availability for the above-referenced documents was published in the *Oswego Palladium Times* on August 21, 1993. The public comment period related to these documents was held from August 24, 1993 to September 22, 1993.

On September 8, 1993, EPA and NYSDEC conducted a public meeting at Oswego City Hall to inform local officials and interested citizens about the Superfund process, to review current and planned remedial activities at the site, to discuss and receive comments on the Proposed Plan, and to respond to questions from area residents and other interested parties.

SUMMARY OF COMMENTS AND RESPONSES

The following correspondence (see Appendix V-a) was received during the public comment period:

- Letter dated September 1, 1993 to Richard Ramon, EPA, from Ronald J. Scrudato, concerning the Proposed Plan.
- Letter dated September 14, 1993 to Richard Ramon, EPA, from Ronald J. Scrudato, following up his September 1, 1993 letter and his comments made at the September 8, 1993 public meeting.
- Letter dated September 16, 1993 to Richard Ramon, EPA, from Mark Valentine of de maximus, inc. on behalf of the PAS Oswego Management Committee, concerning the human health and ecological risk assessments.
- Letter dated September 18, 1993 to Richard Ramon, EPA, from the Board of Directors of the Fulton Safe Drinking Water Action Committee for Environmental Concerns, Inc., concerning the Proposed Plan and comments made at the September 8, 1993 public meeting.

- Letter dated September 21, 1993 to Richard Ramon, EPA, from Anne Rabe, Executive Director, Citizens' Environmental Coalition, concerning the Proposed Plan.

A summary of the comments contained in the above letters and the comments provided by the public at the September 8, 1993 public meeting, as well as EPA's and NYSDEC's response to those comments, follows.

Comment #1: A commenter noted that, at the time of the initial remedial action at the PAS site, it was stated that the slurry wall and cap would remedy the contamination problems. Since contamination has been found outside the containment system, the commenter concluded that the original remediation was either incomplete, because the extent of contamination was missed during the original RI/FS, or the system failed to contain the contaminants within the slurry wall and cap, since contaminants are migrating through the area of the site with thinner till into the bedrock. The commenter expressed concern that the public is now being told that there is a better understanding of how the system works and the preferred remedy will solve the contamination problems.

Response #1: The containment system was constructed to not only contain the contaminated groundwater in the overburden aquifer, but to prevent direct contact, prevent volatile emissions, and reduce infiltration, which in turn, will reduce the generation of contaminated groundwater.

Based upon post-closure site inspections and long-term monitoring results, it has been determined that the containment system is effectively preventing direct contact and preventing volatile emissions.

The hydraulic integrity of the containment system was assessed during the supplemental RI using data from continuous monitoring of water levels at selected monitoring wells located on opposite sides of the slurry wall, monthly water level measurements, and associated meteorological data. The monitoring data demonstrated that the slurry wall is performing effectively. The lack of response of groundwater levels inside the containment system to precipitation suggests that the cover system is performing effectively. Therefore, based on extensive monitoring data collected at the site, the existing containment system is providing hydraulic control of the contained area.

While the bedrock aquifer was, apparently, already contaminated at the time the containment system was constructed, this contamination was not detected when the original RI was performed. The supplemental RI has yielded a better understanding of the hydrogeological conditions at the site. The data suggest that contaminants in the bedrock aquifer originated from the area within the containment system and migrated vertically downward through the lodgement till. The inferred source area for contaminants in the bedrock aquifer is the center of the containment system where the lodgement till is relatively thin. Based upon the RI data, it appears that the increased interim groundwater removal

pumping has modified the horizontal gradients across the slurry wall, resulting in inward gradients along much of the length of the slurry wall (i.e., groundwater tends to flow inward rather than outward toward the slurry wall). In addition, it appears that upward vertical gradients between the bedrock and overburden may have been produced over part of the containment system. Therefore, the data suggest that the subject contamination will be addressed by enhancing the present source control system by optimizing the leachate and groundwater extraction rate and other operating conditions in order to achieve, to the degree practicable, inward horizontal gradients in the overburden and upward vertical gradients from the bedrock toward the containment system, and by actively pumping the bedrock aquifer.

Comment #2: Several commenters wanted to know what future action is planned to determine whether other potential sources of contamination are contributors to the PAS site groundwater problem, concluding that it would be a waste of money to address the PAS site problems now, as long as there continues to be a source of upgradient contamination.

Response #2: It is recognized that the upgradient East Seneca Street Dump, Niagara Mohawk Fire Training School, and Oswego Castings site are potential sources of contamination to the PAS site. Reports prepared by an NYSDEC contractor indicate that both the East Seneca Street Dump and the Fire Training School may have contributed to the contamination of the soil, groundwater, surface water, and sediments in the vicinity of the PAS site. According to these reports, volatile organic compounds, semi-volatile organic compounds, and metals were detected in the groundwater at the East Seneca Street Dump. Because of the lack of data, it is not clear if the volatile organic compounds are also contaminants of concern at the Fire Training School. Available information (data from NYSDEC's 1991 preliminary site assessment) suggest that the Fire Training School may be a source of PCBs in the surface water and sediments in White Creek in the vicinity of the PAS site. In addition, the Oswego Castings site remains a concern as a potential source which may be contributing to PCB contamination in the wetlands adjacent to the Smith's Beach community.

Since the data suggest that contaminants in the bedrock aquifer have originated from within the containment system and have migrated vertically downward through the lodgement till, it would be appropriate to address the contamination that is believed to be attributable to the PAS site, while the ongoing studies at the upgradient sites continue. Any contamination attributable to the upgradient sites will be addressed upon completion of the ongoing studies at these sites.

Comment #3: A commenter noted that a number of interim remedies were conducted at the PAS site to reduce the off-site migration of contaminants to the two local tributaries and to Lake Ontario including the removal of leaking drums, surface and subsurface storage tanks, and the incinerator, and the draining and backfilling of the two on-site lagoons. The

commenter further noted that, although it was clear that the lagoons contained highly contaminated soils and sediments, the removal and treatment of the highly contaminated lagoon sediments was not considered. The commenter expressed concern that, as long as highly contaminated soils and sediments remain buried at the site, they will continue to be a source of contamination to the groundwater. The commenter suggested that select excavation of the areas which were occupied by the two lagoons would significantly reduce the source of contaminants, thereby accelerating the eventual reduction of substances in the surrounding groundwater. The commenter added that, continuing with the containment strategy selected in the 1984 Record of Decision (ROD) will require that groundwater be withdrawn and treated for decades, particularly since there is a large volume of highly contaminated sediments buried beneath the cap.

Response #3: While the lagoons contained highly contaminated soils and sediments after they were drained and backfilled in 1982, to remove the sediments at that time would have only eliminated a portion of the contamination on-site. The original RI data indicate that soil contamination was significant, widespread, and non uniform across the site, suggesting multiple on-site sources of contamination. Although the removal of the contaminated soils and sediments would have provided the most effective and complete removal of contaminants from the site, given the size of the site, containment of the waste mass was determined to be the only practical means to remediate the site.

Since the containment of the waste, as called for in the 1984 ROD, is providing adequate protection to the public and the environment, and since there are other sources of contamination at the site, to eliminate the lagoon sediments at this time would not provide a greater degree of protection to public health and the environment.

Since the extent of the source of contamination present in the containment cell is largely unknown, determining how long the leachate and contaminated groundwater must be controlled is indeterminate.

Comment #4: Several commenters expressed concern that EPA would consider using the City of Oswego's wastewater treatment plant, which discharges to a major source of drinking water, particularly when there is such great emphasis on the reduction and virtual elimination of persistent toxic chemical discharges to the Great Lakes. Although the current plume does not appear to contain PCBs, one commenter was concerned that the PCBs which are contained at the site might be mobilized by the volatile organics or that PCBs from the upgradient sources might find their way into the wastewater treatment plant and pass through to the sludge. In addition, a commenter expressed concern that the sludge would concentrate the trace metals known to exist at the site.

A commenter also expressed concern that one will never be able to monitor whether the wastewater treatment is treating the influent from the PAS site since a contribution of 50,000 gallons per month of leachate and contaminated groundwater from the site would

be substantially diluted by the 3 million gallons per day flow at the wastewater treatment plant. At this dilution, the analytical protocols would not allow effective monitoring of the wastewater treatment plant's discharges to determine whether the contaminants have been degraded.

Several commenters suggested that the contingent treatment option, on-site treatment, be employed.

Response #4: The purpose of wastewater treatment plants is to serve as central facilities which remove pollutants and contaminants from municipal and industrial wastes that are generated in specific areas. The results of treatability studies that were performed on the site's leachate and a study of the feasibility of discharging leachate from the PAS site to the wastewater treatment plant indicated that the PAS leachate includes organic contaminants that are amenable to treatment in a biological treatment system, such as the one at the wastewater treatment plant. Also, the study indicated that the metals in the leachate are low in comparison to the allowable levels at the wastewater treatment plant, and would not inhibit wastewater treatment effectiveness or the sludge incineration process. Although the leachate would be classified as a Resource Conservation and Recovery Act (RCRA) listed waste (waste code F039), it would fall within the Domestic Sewage Exclusion, 40 CFR 261.4, and would not require a RCRA permit for purposes of discharge to the wastewater treatment plant. The study concluded that the PAS leachate would:

- not affect wastewater treatment plant employee health and safety;
- conform with the City of Oswego's pretreatment requirements; and
- not impact the wastewater treatment plant's ability to comply with its effluent limitations or sludge disposal requirements.

Assuming that all of the City's obligations related to the wastewater treatment plant are satisfied (such as the implementation of an Industrial Pretreatment Program) and that the City is willing to accept the discharge, EPA and NYSDEC approval of the subject discharge would be contingent upon a determination that the proposed discharge (with or without pretreatment) would not adversely impact the plant's treatment processes or sludge disposal practices and that it would not contribute to permit violations or cause water quality criteria in the receiving waters to be exceeded.

In the event that the wastewater treatment plant option cannot be implemented, the on-site treatment option would be implemented as a contingent option for treatment and disposal.

If the wastewater treatment plant option is implemented, the groundwater and leachate would be monitored at the PAS site using strict protocols defined by the City of Oswego, NYSDEC and EPA. Specific monitoring protocols would be developed, which would include frequency of sampling and reporting, sampling methods and locations, analytes, and

analytical testing methods. For example, instrumentation used for analysis of organic compounds could include a gas chromatograph or a gas chromatograph/masspectrometer. Analytical detection limits would be in the low parts per billion range with this type of instrumentation and analytical techniques. With detection limits in the low parts per billion range, treatment effectiveness at the wastewater treatment plant could be adequately monitored and demonstrated even considering that the proposed PAS discharge would comprise less than one percent of the total wastewater entering the treatment plant. If the influent concentrations are, at any time, determined to be unacceptable, pretreatment of the influent or on-site treatment may be required.

Monitoring at the wastewater treatment plant would be performed both on the influent and the effluent. Current monitoring protocols at the wastewater treatment plant would be modified, as necessary, to insure that the treatment system performance is not inhibited and that the proposed PAS discharge is treated properly. The monitoring program would be coordinated with the timing of specific PAS discharge events and related monitoring at the PAS site, since the proposed PAS discharge would be intermittent. The wastewater treatment plant's effluent would be monitored in accordance with requirements provided in its State Pollutant Discharge Elimination System (SPDES) discharge permit, which contains monitoring requirements for specific parameters required to insure that Lake Ontario's water quality is being protected.

Comment #5: Several commenters asked what impact to Lake Ontario would be expected from the proposed discharge of PAS site groundwater and leachate to the wastewater treatment plant? One commenter also asked what impact to the adjacent Wine Creek or White Creek and, subsequently Lake Ontario, would be expected if the PAS site's contaminated groundwater and leachate were treated on-site and discharged to Wine Creek or White Creek?

Response #5: One condition of approval of the wastewater treatment plant treatment option will be a determination that the proposed discharge would be treated properly at the wastewater treatment plant prior to discharge to Lake Ontario. The SPDES permit for the subject plant was issued by NYSDEC with specific discharge requirements that were developed based on the protection of water quality in Lake Ontario.

A discharge from an on-site treatment system to Wine Creek or White Creek would have to comply with SPDES discharge requirements to insure protection of White and Wine Creeks and Lake Ontario. The discharge requirements would be based upon water quality criteria that would maintain the quality of these waters and prevent any adverse impacts.

Comment #6: A commenter wanted to know whether or not the City of Oswego will incur any costs related to sewerline construction and maintenance.

Response #6: If the City of Oswego's wastewater treatment plant treatment option is ultimately selected, the construction of the sewer connection to the Mitchell Street sewer extension and all associated costs would be incurred by either the potentially responsible parties (PRPs) (if, following EPA's post-ROD negotiations they agree to design and implement the selected remedy) or EPA and the State (if the PRPs do not agree to design and implement the selected remedy). The maintenance of the sewerline would be the responsibility of the City. The cost related to this maintenance should be covered by the fees that will be charged to the PAS site as a customer of the wastewater treatment plant.

Comment #7: A commenter asked whether EPA would pay for the upgrade, since the City of Oswego has been told to upgrade its treatment processes and EPA is supporting the utilization of the wastewater treatment plant to treat the leachate and contaminated groundwater from the site, contingent upon, among other things, the upgrade of the wastewater treatment plant.

Response #7: The connection to the wastewater treatment plant assumes that the upgrade has been completed. Since the upgrade is necessary regardless as to whether or not the PAS leachate and contaminated groundwater is treated at the wastewater treatment plant, paying for the upgrade would not be the responsibility of EPA.

Comment #8: One commenter noted that New York State allows sludge to be spread on agricultural lands. The commenter expressed concern that landspreading sludge contaminated with hazardous substances from the PAS site could eventually cause groundwater and surface water contamination. The commenter urged utilizing on-site treatment as a means of solving the "sludge problem."

Response #8: Sludges will be generated regardless of whether the PAS leachate and contaminated groundwater is treated at an on-site treatment facility or at the City of Oswego's Eastside wastewater treatment plant. It is likely that sludges generated from an on-site treatment facility would be taken off-site for treatment. The sludges from the City of Oswego's Eastside wastewater treatment plant are incinerated, not landspread.

Comment #9: A commenter wanted to know whether or not there is any monitoring of air emissions from the wastewater treatment plant's sludge incinerator.

Response #9: The air emissions are monitored to ensure compliance with its air emission permit requirements.

It should also be noted that monitoring of the sludge incinerator ash quality is performed in accordance with EPA and NYSDEC requirements. Sludge incinerator ash is and would continue to be monitored to compare ash quality with state and federal regulatory

requirements. A June 1993 evaluation of the wastewater treatment plant option performed by O'Brien & Gere Engineers, Inc., on behalf of the PRPs, concluded that the introduction of contaminated groundwater and leachate from the PAS site into the Eastside Wastewater Treatment Plant would not cause the incinerator ash quality to exceed state or federal ash quality standards.

Comment #10: Several commenters asked what the current health risk associated with the site was. Of particular concern was the threat to Smith's Beach.

Response #10: Private wells in Smith's Beach have been tested, with no site-related contamination indicated. The results of the baseline risk assessment performed during the supplemental RI indicate that only the potential future exposure to the bedrock aquifer via ingestion poses an unacceptable risk to human health. The cumulative upper-bound cancer risk at the site is $7x10^{-4}$ for children and $8x10^{-4}$ for adults. Hence, the risks for carcinogens at the site are not within the acceptable risk range of 10^{-4} to 10^{-6}. Connecting downgradient residents in the Smith's Beach area using residential wells to the public water supply and implementing institutional controls on groundwater usage through deed restrictions at the PAS site and downgradient from the site to the Smith's Beach area will protect public health while the contaminated groundwater is extracted and treated.

Comment #11: Several commenters expressed concern that the treatment of the leachate and contaminated groundwater at the City of Oswego's wastewater treatment plant was a foregone conclusion, since it was identified as EPA's and NYSDEC's preferred remedy.

Response #11: The purpose of a Proposed Plan is to inform the public of EPA's and NYSDEC's *preferred* remedy and to solicit public comments on all of the remedial alternatives evaluated, as well as the preferred remedy. Changes to the preferred remedy or a change from the preferred remedy to another remedy can be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. A final decision regarding the selected remedy is made only after EPA has taken into consideration all public comments.

The Proposed Plan for the PAS site identifies the treatment and disposal of the leachate and groundwater from the site at the City of Oswego's wastewater treatment plant as the preferred treatment option, with on-site treatment/disposal as a contingent option. After reviewing the three leachate and contaminated groundwater treatment and disposal options that were considered, as well as public comments, EPA has determined that treatment of the leachate and contaminated groundwater at the City of Oswego's wastewater treatment plant is the most appropriate treatment and disposal alternative, with on-site treatment/disposal as a contingent alternative. The selection of the City of Oswego's wastewater treatment plant for the treatment and disposal of the leachate and contaminated groundwater, however, in no way obligates the City to accept the leachate and contaminated

groundwater, nor does it imply that EPA and NYSDEC will ultimately approve the discharge. Assuming that all of the City's obligations related to the wastewater treatment plant are satisfied (such as the implementation of an Industrial Pretreatment Program) and that the City is willing to accept the discharge, EPA and NYSDEC approval of the subject discharge would be contingent upon a determination that the proposed discharge (with or without pretreatment) would not adversely impact the plant's treatment processes or sludge disposal practices and that it would not contribute to permit violations or cause water quality criteria in the receiving waters to be exceeded.

In the event that the wastewater treatment plant alternative cannot be implemented, the on-site treatment/disposal alternative would be implemented as a contingent option for treatment and disposal.

Comment #12: One commenter expressed concerns relative to the reasonableness of a number of the exposure assumptions used in the human health risk evaluation, including exposure duration, exposure frequency, and the methodology for the selection of chemicals. The commenter also expressed concern relative to the impact of upgradient sources of surface water contamination of the risk assessment conclusions.

Response #12: EPA, in following its risk assessment guidelines (*Risk Assessment Guidance for Superfund*), adopts a conservative approach in its risk assessments. The values/criteria that are claimed to be unreasonable are standard default values that EPA uniformly applies at all sites. Hence, the computed risks represent the reasonable maximum exposure (RME) case, defined as the maximum exposure that can reasonably be expected to occur. In those cases where EPA's acceptable target/range is exceeded, remedial action is appropriate. Therefore, the potential future exposure to overburden and bedrock aquifers via ingestion needs to be addressed. The computing of a less conservative "average" case was done in accordance with EPA policy, which requires this be done when the RME analysis exceeds EPA's risk thresholds.

The results of the baseline risk assessment indicate that only the potential future exposure to the bedrock aquifer via ingestion posed an unacceptable risk to human health. The other carcinogenic risks associated with the site are in the acceptable range.

The Hazard Index, which reflects noncarcinogenic effects for a human receptor, exceeded unity for adults and children for ingestion of groundwater from the bedrock aquifer and for children ingesting surface water, sediment, and fish.

While the Hazard Index associated with the ingestion of surface water, sediment, and fish by children exceeds the acceptable level, it is uncertain whether the PAS site is the source of this contamination, since there are several potential sources of surface water and sediment contamination located upstream of the site. In conjunction with evaluating the data generated by the ongoing and planned studies related to the adjacent East Seneca Street

Dump, Niagara Mohawk Fire Training School, and Oswego Castings sites, a study will be conducted to determine the source of contamination to the surface water and sediments located in the adjacent creeks. If, based upon these investigations, it is determined that the contamination in the adjacent creeks or wetlands is attributable to the PAS site, then remedial alternatives to address this contamination will be evaluated.

Comment #13: One commenter expressed concerns relative to the ecological risk assessment in terms of the applicability of a number of the comparisons made between the toxicological databases and scientific literature and the actual on-site case exposures that are occurring to nonhuman receptors. The commenter also expressed concern relative to upgradient sources of surface water and sediment contamination.

Response #13: The qualitative ecological assessment found that aquatic species and aquatic invertebrates, in particular, are the most at risk as indicated by the similarity of detected surface water and sediment values in the vicinity of the site to toxicity values. In the case of surface water, levels of some constituents exceed those that are believed to be protective of 95% of aquatic life forms (i.e., Federal Ambient Water Criteria). Sublethal effects of contaminant toxicity may be occurring at the site. As some of the contaminants present bioaccumulate, affected aquatic invertebrates may be posing a risk to upper trophic level species who use them as a food source. The potential for transmitting risk through the food chain is present for the fathead minnow, a resident species at the site, as PCBs have been detected in fish collected from creeks at the site. In addition, the minnows are expected to have continual exposure to elevated levels of aluminum, DDE, and DDT, although this exposure is not likely to threaten fish survival. Although a definitive statement cannot be made regarding impacts to the Spring Peeper and other amphibious life, the contaminants aluminum and DDT/DDE are present at levels that strongly indicate toxicity to these aquatic receptors. There is a potential risk to the green-backed heron through its diet (a significant portion of its exposure) from DDT/DDE, PCBs, aldrin, and metals. PCB concentrations in the sediments are close to the values reported to cause adverse reproductive and survival effects. The shrew, typifying small mammals at the site, is expected to have relatively low exposures to surface water/sediment, and thereby any adverse health risks are assumed to be sublethal. Contaminant body burdens, however, may transfer contaminants to higher trophic level organisms (e.g., mink and green-backed heron). Reproduction or survival of these higher forms could be impacted via this transfer, mostly caused by the bioaccumulable DDT/DDE, PCBs, aldrin, and some metals. Based upon the results of the qualitative ecological assessment, a potentially significant impact may occur to mink if present at the site because of their extreme sensitivity to PCBs. Detected sediment levels are well within the range of values reported to cause reproductive impairment and mortality, via their dietary (aquatic sources) exposure.

It should be noted that, while the levels of PCBs, PAHs, and pesticides present in the sediments in the depositional areas of the creeks in the vicinity of the site may pose an unacceptable risk to individual mink that might use the creeks and adjacent wetlands as

foraging areas, it is uncertain whether the PAS site is the source of this contamination, since there are several potential sources of surface water and sediment contamination located upstream of the site. In conjunction with evaluating the data generated by the ongoing and planned studies related to the adjacent sites, a study will be conducted to determine the source of contamination to the surface water and sediments located in the adjacent creeks. If, based upon these investigations, it is determined that the contamination in the adjacent creeks or wetlands is attributable to the PAS site, then remedial alternatives to address this contamination will be evaluated.

APPENDIX V-a

RESPONSIVENESS SUMMARY

LETTERS SUBMITTED DURING THE PUBLIC COMMENT PERIOD

Mr. Richard Ramon, P.E.
Project Manager
Western New York Superfund Section 1
Emergency and Remedial Response Division
USEPA
26 Federal Plaza
New York, N.Y. 10278

September 1, 1993

Dear Mr. Ramon:

I appreciate the opportunity to comment on the **Proposed Plan for the Pollution Abatement Services Site, August, 1993.** Although I have not had the opportunity to review the supplemental RI/FS, there are a number of points I would like to address regarding the preferred remedy.

At the time the PAS site was being investigated, a number of interim remedies were conducted to curb the offsite migration of contaminants to the two local tributaries and to Lake Ontario. In addition to the removal of leaking drums, removal of surface and subsurface storage tanks and the actual incinerator, the two on-site "lagoons" were drained and backfilled. At the time the lagoons were emptied and in subsequent investigations, it was known that the lagoons contained some of the highest concentrations of contaminants. The NYS Department of Environmental Conservation assumed lead status for the remediation of the PAS site and although it was clear that the lagoon areas contained highly contaminated soils and sediments, DEC refused to consider the removal and treatment of the highly contaminated lagoonal sediments. The sediments were simply buried and I'm confident continue to contribute to the problems related to groundwater contamination. As long as highly contaminated soils and sediments remain buried at the PAS site, the groundwater will continue to be contaminated requiring withdrawal and treatment of the groundwater or leachate for decades. If this is the case, why wasn't excavation of known sources of highly contaminated sediments considered in the remedial alternatives? Select excavation of the ares which were occupied by the two lagoons would significantly reduce the source of contaminants thereby accelerating the eventual reduction of substances in the surrounding groundwater.

At the time of the initial remedial action at the PAS site, it was stated that the slurry wall and the tight cap would clearly remedy the problem. In addition, DEC also refused to conduct a detailed investigation of the upgradient source(s) of contaminants to the PAS site including the relationship of the East Seneca Street Dump to groundwater contamination. How is it known that groundwater contamination of the PAS site doesn't, at least in part, derive from upgradient sources?

Based on these points, it is likely that the source of the contaminants in the groundwater derive from either highly contaminated sediments or from offsite migration into the PAS property. Why isn't sediment source reduction being considered at this time to remove the source(s) of the groundwater contamination?

In addition, if the slurry wall and cap were designed and constructed to significantly reduce the quantity of groundwater within the site, why is it that contaminated groundwater continues to flow from the site into the surrounding areas. Where are the contaminants originating from? From within the slurry wall or from offsite? If the cap is working, as designed, then the major source of groundwater has to be from outside the cap perimeter and slurry wall suggesting that groundwater, and possibly contaminated groundwater from the East Seneca Street Dump and elsewhere, is migrating through the slurry wall into the PAS site. What future action is planned to determine whether the East Seneca Street Dump and other potential sources, are contributors to the PAS site groundwater problem?

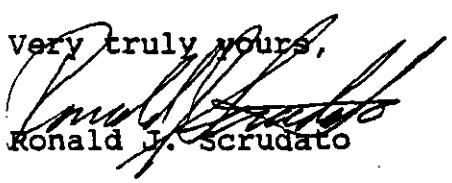
Regarding the use of the POTW for the disposal of contaminated groundwater and leachate collected from the site, it is unconscionable that USEPA would consider using the sewage treatment plant that discharges to a major source of drinking water particularly when there is such great emphasis on the reduction and virtual elimination of persistent toxic chemical discharges to the Great Lakes. At the estimated 50,000 gallons per month groundwater withdrawal and at the estimated total BTEX concentration of 1790, almost 10 pounds of BTEX will be discharged to the POTW annually. In addition, over a pound of nickel and arsenic (combined), and about a pound and a half of chlorinated ethanes and ethenes will be discharged to the POTW and eventually to Lake Ontario.

The alternative that should be implemented is the one requiring on-site treatment coupled with discharge to the groundwater rather than to local tributaries and Lake Ontario. The treated effluent should be discharged to the groundwater upgradient of the slurry wall and not be transported to a local POTW. Local POTWs were not designed or ever intended to be used for the disposal of hazardous wastes and although it would reduce the overall remedial cost, this alternative does not advance the overall reduction of contaminants to an already stressed system.

As I commented to DEC at the time they insisted on ignoring the highly contaminated sediments known to be associated with the lagoons in the early to mid-1980s, the remedy is flawed and driven by expediency as well as a lack of experience on the effectiveness of caps and slurry walls. What is being proposed now is a continuation of a remedy that has proven to be ineffective. USEPA is continuing to build on a poor initial remedy on the Number One NPL Site in New York. It is now time to meet the mandates of SARA and strive to cleanup the PAS site rather than conducting piecemeal containment strategies. The containment strategy will require that groundwater be withdrawn and treated for decades particularly since there is a large volume of highly contaminated sediments buried beneath the cap. Nowhere is it mentioned how long the pump and treat system will have to operated. The public should be made aware of the time that will be required to remediate the site to ensure they understand the long term ramifications and required commitments.

Hopefully these comments will receive serious consideration before USEPA makes its final decision on this site and if you have questions relating to my comments, please don't hesitate to contact me.

Very truly yours,



Ronald J. Scrudato

Mr. Richard Ramon, P.E.
Project Manager
Western New York Superfund Section 1
Emergency and Remedial Response Division
USEPA
26 Federal Plaza
New York, N.Y. 10278

Dear Mr. Ramon: September 14, 1993

I want to follow up on my letter of September 1, 1993 and comments I made at the September 8, 1993 public meeting on the supplemental RI/FS for the Pollution Abatement Services NPL Site.

As I mentioned, I believe USEPA is not giving enough consideration to the store of contaminated sediments within the slurry wall and the contributions deriving from upgradient sources. If you review the comments of the public meeting you will note that there were two explanations provided to explain the source of contaminants outside the slurry wall including;

1. the contaminants were always there and were not detected at the time the original RI/FS was conducted; or/and

2. contaminants are migrating through the area of the site with thinner till into the bedrock.

In either case, the original remediation was either incomplete because the extent of contamination was missed during the original RI/FS, or the system failed to contain the contaminants within the slurry wall and cap. Now we are being told that there is a better understanding of how the system works and the preferred remedy will resolve the problem.

To date, there has been no adequate explanation of whether or how the Old Dump or the Niagara Mohawk Fire Fighting School relates to the PAS site problem. DEC has delisted the Old Dump and with that action, it is assumed the problem is resolved even though it is documented that the Old Dump continues to be problemened by

leachate breakouts and that there is a reasonable likelihood that the Dump may be partially responsible for the PAS groundwater problem. Again, I want to restate that it is foolish and a waste of money to address the PAS site problems as long as there continues to be a source of upgradient contamination.

Regarding the use of the Oswego POTW for getting rid of the PAS leachate, I want to reemphasize that these systems were never intended to be used for treating hazardous wastes. The plume of contaminants from the PAS site consist primarily of VOCs although it is known that the site contains PCBs and also that there is an upgradient source of PCBs. Although the current plume does not appear to contain PCBs at this time, it is well known that VOCs serve as a solvent and can cause the mobilization of these compounds. In addition, as PCBs undergo degradation, they become increasingly more soluble. It is therefore possible that the PCBs may become mobilized through time. Disposal of VOCs to a POTW should take into consideration the potential for other contaminants reaching the system, and if the City of Oswego agrees to receive this leachate, no batch of leachate should be discharged to the POTW without full analysis being conducted including congener-specific PCB analysis. It is important to conduct congener specific analysis to be able to determine whether other sources of PCBs will also be mobilized in time. PCBs will not be affected by the biological degradation of the POTW and will concentrate in the sludge essentially unaffected as will the trace metals known to exist at the site.

There are viable alternatives to POTW discharges including the photocatalytic process described in the enclosed. Photocatalytic degradation is much faster than biodegradation and can be conducted on site without modifications to the current "pump and treat" process. I realize photolysis was used at the PAS site in the past. The photocatalytic process is more effective and is capable of degrading a broader range of contaminants including PCBs (see enclosed CHEMOSPHERE article).

What also concerns me about the POTW issue is that this will set precedent and that it will set the stage for similar preferred remedies for the other area sites including the FTS and Silk Road Landfill NPL sites. The City of Oswego must weigh this factor since both of these sites are upstream of the City and Lake Ontario. The use of POTW for disposal of hazardous waste should not be considered because as I stated at the public meeting, you will never be able to monitor whether the system is working. the dilution factor of 30,000 gallons per month against 3,000,000 gallons per day from the POTW, results in a dilution factor of 0.0003 or about .03 of one percent. At this dilution, the analytical protocols do not allow effective monitoring of the POTW discharges to determine whether the contaminants have been degraded.

Hopefully, these comments help clarify my concerns relative to the preferred remedy and I hope that USEPA will not continue the policies and practices that almost guarantee that we will be revisiting this matter periodically over the next several decades because poor decisions continued to be made.

Very truly yours,

Ronald J. Scrudato
encl.

cc: T. Hammill

de maximis, inc.

9041 Executive Park Drive
Suite 401
Knoxville, TN 37923
(615) 691-5052

September 16, 1993

Mr. Richard Ramon, P.E.
U.S. Environmental Protection Agency
26 Federal Plaza
Region II
New York, NY 10278

RE: PAS Oswego SRI/FS Comments on final USEPA Human Health Risk Assessment and Endangerment Assessment

Dear Mr. Ramon:

Enclosed please find comments prepared by Menzie-Cura & Associates on the final US EPA Human Health Risk Assessment and Endangerment Assessment (June 16, 1993). Additional comments related to the USEPA Endangerment Assessment are also provided in Menzie-Cura's letter of August 4, 1993. The August 4, 1993 Menzie-Cura comments are specifically related to the USEPA's response to the "Estimate of PCB-Related Risks to Mink for the White and Wine Creeks" dated June 22, 1993.

If you have any questions, please call me.

Sincerely,

Clay McClarnon for

Mark Valentine

MV/mt

cc: PAS Oswego Management Committee

File:pas91693/3023

COMMENTS ON
EPA HUMAN HEALTH RISK ASSESSMENT
AND ENDANGERMENT ASSESSMENT
FOR THE PAS SITE, OSWEGO NEW YORK

June 16, 1993

Prepared For:

PAS Oswego SRI/FS Trust

Prepared By:

Menzie-Cura & Associates, Inc.
Chelmsford, MA 01824

Menzie-Cura & Associates, Inc. has reviewed Volume I - Risk Assessment of the "Final Endangerment Assessment, PAS Oswego Site, Oswego, New York" and Volume II "Final Endangerment Assessment" prepared for the U.S. Environmental Protection Agency (EPA) by CDM Federal Programs Corporation (May 26, 1993). Comments regarding the EPA human health risk assessment are based on our review of Volume I - Risk Assessment and Volume II - Risk Assessment Appendices. Previous comments from Menzie-Cura & Associates, Inc., as summarized in a technical memorandum to EPA (May 5, 1993), are incorporated herein.

PART A COMMENTS ON EPA HUMAN HEALTH RISK ASSESSMENT

Organization of Comments

Comments are presented in the following format:

- Summary of Evaluation for Reasonable Maximum Case
- Summary of Evaluation for Central Tendency Case
- Comments *(these are presented in italic typeface)*

The Summary of Evaluations provided for both the Reasonable Maximum Case and Central Tendency Case are based on the information and assumptions included in the EPA risk assessment. Any restatement or summary of the information provided in the text, tables, or calculations, does not necessarily represent agreement or concurrence with the information presented.

We have also performed a quality assurance check on data transcription and on the calculations. The results of this evaluation are presented at the end of this document.

I. General Comments

Use of Reasonable Maximum Exposures (RME)

The goal of using "reasonable maximum exposures" in risk assessment is to combine upper-bound and mid-range exposure factors, which result in an estimation of risk which is both protective and realistic. The RME is not intended to represent unlikely or improbable worst-case scenarios (EPA, 1991). The EPA's RME scenarios for this risk assessment do not combine mid-range and upper-bound exposure factors to arrive at risks; rather, only upper bound estimates are used. Specifically, the RME scenarios are evaluated using upper-bound estimates of exposure durations, exposure frequencies, intake and uptake of contaminated media, and exposure point concentrations. By evaluating *only* upper-bound assumptions for the RME scenarios, risks are generated based on highly unlikely exposures.

Use of Central Tendency or Average Exposure Assumptions

The EPA's risk assessment uses a central tendency, or average case, to assist in interpretation of uncertainty. However, the exposure parameters used for these scenarios are not indicative of "average" conditions. Instead of incorporating average values, such as the arithmetic or geometric means, the EPA risk assessment uses 95% upper confidence limits on the mean and maximum concentrations. In addition, as detailed later in the document, many of the exposure factors such as ingestion rate of soil and water are above reported average values. This results in an arbitrary estimate of exposure, and does not represent "average" exposure conditions.

Selection of Compounds of Potential Concern

EPA's Compounds of Potential Concern may include several compounds not related to previous site activities, and therefore should not be included in the risk assessment. According to Section 2.3, Criteria for the Selection of Chemicals of Potential Concern (p. 42), nine different screening criteria were to be used to select the Compounds of Potential Concern. Some of these criteria were discussed within the risk assessment. The most significant criteria, not discussed or apparently evaluated in this section, was the comparison of chemical concentrations relative to upgradient concentrations. Several compounds, such as manganese and arsenic, were detected in upgradient surface water samples at similar concentrations to those found on-site. However, this does not appear to have been considered even though the risk assessment identified this as a criterion. The risk assessment should also note the data available for PCBs in upstream sediments. References for these data are provided later in the comments.

II. Risks to Residents and Future Commercial/Industrial Site Workers - Exposure to Groundwater

Summary of Evaluation for Reasonable Maximum Case

1. Risks were calculated separately for the overburden and for bedrock. Excess lifetime cancer risks (ELCR) exceed 1.0 E-4 (one in ten thousand) over a lifetime, and hazard indices for systemic toxic effects exceed the benchmark of "1."

2. Most of the ELCR risk for overburden wells was related to vinyl chloride, and secondarily to benzene. For groundwater in bedrock, most of the ELCR risk was due to a combination of arsenic and vinyl chloride as well as benzene.

3. The risks associated with exposure to groundwater are calculated, based on measurements from wells outside the slurry wall. They do not reflect an actual exposure to a real population, but rather a possible future exposure in

the event of development in the area (assuming such development would not rely on the existing city water supply in the area).

4. Risks to site workers were estimated for a hypothetical future scenario involving placement of a commercial or industrial well in the contaminated groundwater. ELCR risks exceed 1.0E-04 and hazard indices exceed "1". Chemicals contributing to the risks for site workers are the same as those for residents.

Summary of Evaluation for Central Tendency Case

1. Risks associated with exposure to overburden groundwater exceed 1.0 E-05 for adults and 1.0 E-04 for children. Values exceed 1.0 E-04 for bedrock groundwater exposure.

Comments

1. *Risks to residents and site workers have been calculated for hypothetical future cases and do not reflect current conditions. If the results of the risk analyses are to be used to evaluate the need for remediation*[1]*, then it is appropriate to consider the following:*

   - *the locations of possible future wells - the presence of wetlands and other features at and around the site significantly restricts where, if at all, any future wells might be placed; an assessment of possible future well locations would provide a better basis for evaluating where exposure could occur;*

   - *the likelihood of possible future wells - this should first consider the likelihood of future development within the area of potentially impacted groundwater, as well as likelihood that future homes or commercial properties would be serviced by individual wells, or rather, would be tied into the city water supply inasmuch as city water is now available to this general area now;*

[1] Remedial decisions regarding contamination of groundwater typically include a consideration of ARARs, as well as estimates of risk. In the present case, risks are to hypothetical future residents or workers. Resolution of the risk issues with respect to their likelihood, as well as the best means to reduce risk, should provide useful guidance on how to proceed.

- *an appropriate model to estimate exposure point concentrations for constituents in groundwater at possible future well sites or with distance from the site - this model would also serve to indicate the zone or area within which MCLs and other ARARs may be exceeded.*

2. *The suggested drinking water volume of 2 l/day is too high for children in the 1-6 year age group. A value of 1 l/day is more appropriate for both the maximum and central tendency cases (Exposure Factors Handbook, 1989).*

3. *Inhalation of chemicals from shower water is included as an exposure pathway. Given the hypothetical nature of the scenario and uncertainty in the data, does the analysis support this level of sophistication?*

4. *Arsenic concentrations in groundwater are less than the MCL values and may reflect background conditions.*

III. Risks to Residents - Exposure to Surface Water

Summary of Evaluation for Reasonable Maximum Case

1. Risks associated with ingestion of surface water from the creeks, or direct contact with creek water, are *de minimus*.

Comments

1. *No comment.*

IV. Risks to Residents - Exposure to Sediments

Summary of Evaluation for Reasonable Maximum Case

1. ELCR risks associated with ingestion of sediment exceed 1.0E-05 (one in one hundred thousand) for both adults and children. These risks are due primarily to PCBs and to a lesser extent, arsenic and benzo(a)pyrene. The PCB values are the maximum detected in the creek at the site (from the beaver pond).

2. Exposure to sediment via dermal contact were calculated to exceed risk levels of 1.0 E-05 for adults and 1.0 E-06 for children. These risks were due exclusively to PCBs.

3. Overall, combined risks associated with exposure to sediments via incidental ingestion and dermal contact exceed 1.0 E-05 but fall within the 1.0 E-06 to 1.0 E-04 range.

Summary of Evaluation for Central Tendency Case

1. The sediment ingestion and dermal contact pathways result in less than 1.0 E-06 lifetime ELCR risk individually. When the two pathways are combined, the risk slightly exceeds 1.0 E-06 for children.

Comments

1. *EPA has used standard EPA values for daily incidental ingestion of soil (100 mg/day for adults and 200 mg/day for young children) to estimate incidental ingestion of sediment associated with visits to the site. The EPA's default numbers for soil ingestion are generally recognized as conservative estimates for daily exposure. We suspect that they are very conservative when applied to sediment ingestion associated with short-term visits to the site. The conservative nature - or at least uncertainty - associated with this exposure pathway should be explicitly considered in the risk assessment report. The conservative nature of this exposure pathway should be taken into account as part of the risk management stage of the analysis.*

2. *For both adults and children, an exposure frequency of 78 days per year is used by EPA for the maximum reasonable exposure (from the time a child is one year old to a maximum exposure duration of 30 years). This value of 78 days per year is carried through all other aspects of the exposure scenario. The exposure scenario combines this frequency of visits with ingestion of, and dermal contact with, sediment. In addition, data for the maximum value of PCBs in White Creek are used as an exposure concentration. This combination results in the estimated risk levels in excess of 1.0 E-5 for children and adults that may trespass on the site.*

   At the February 1993 EPA meeting regarding this site, the likely frequency of visits to the site were discussed at a conceptual level. In particular, the discussion included: i) the number of total visits, ii) the number of visits that would involve fishing, and iii) the number of likely visits during which the visit would involve coming into direct contact with sediments, resulting in an ingestion rate of 100 mg/day for adults and 200 mg/day for children. It seemed reasonable to presume that these were not all identical, as specified in Table 3-12 by EPA. Fishing, for example, was recognized to be very seasonal; and entry into the water with subsequent contact with sediment was also recognized to be a less likely event than a visit (walk through) of the area. As another example, if EPA concluded that exposure to surface soils needed to be

considered, would the exposure route have included incidental ingestion of both surface soils (at 100 or 200 mg/day) as well as sediment (at 100 or 200 mg/day)? This would have amounted to a soil/sediment ingestion in excess of anything reported in the literature for non-pica behavior. Clearly, relaxing one or more of the assumptions on frequency of visits, sediment ingestion, or selection of data, would result in a much lower estimate of risk for the reasonable maximum case.

EPA should separate out visits to the general area, fishing events, and events involving sediment contact for the reasonable maximum exposure[2]. These should be specified differently to reflect the available site-specific knowledge concerning use of the area for fishing, and logic concerning reasonable maximum exposure.

3. *Arsenic should not be a chemical of potential concern for sediments because it is present at background concentrations, well within the range of typical elemental abundance for sediments and soils. The maximum concentration at and below the site is essentially the same as the maximum value in upstream sediments. Both maximum values fall within the typical background range for this metal reported in the literature for states in the Northeast. The available data for New York, Massachusetts and New Jersey should be considered.*

4. *Risk management decisions related to the presence of chemicals in sediments should take into account potential upstream sources as well as the spatial distribution of sediment type. There are a number of sources upstream from the PAS site which contribute PCBs, pesticides, other organic compounds, and metals.*

Two of these sites - East Seneca Street Dump and the Niagara Mohawk Fire Training School - have been investigated by URS Consultants[3,4]. With regard to PCBs, the Fire Training School appears to be particularly important as a source to White Creek. High levels of PCBs (in excess of 50,000 ug/kg) have been found at this site and have been detected in creek sediments adjacent to

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[2]EPA has made this distinction for the Central Tendency Case and we suggest that the logic used there should also be reflected in the Maximum Reasonable Exposure Case.

[3]URS Consultants. 1991. Engineering Investigations at Inactive Hazardous Waste Sites: Preliminary Site Assessment for Niagara Mohawk Fire Training School, Oswego. Prepared for New York State Department of Environmental Conservation, Albany, New York.

[4]URS Consultants. 1992. Engineering Investigations at Inactive Hazardous Waste Sites: Phase II Investigation for East Seneca Street Dump Oswego. Prepared for New York State Department of Environmental Conservation, Albany, New York.

the Fire Training School (51 - 535 ug/kg). PCBs introduced to White Creek at the Fire Training School could be transported downstream and become deposited in the slower moving portions of the creek behind the beaver dams. The main source of the pesticides is probably the agricultural land that drains into the creek systems. The distribution of contaminants in White and Wine Creeks reflects possible source areas, as well as grain size and organic content of the sediment.

5. *For soil ingestion there are several published papers by Calabrese, Thompson[5] and others that provide statistics on the median values for soil ingestion. Calabrese[6] has completed a re-evaluation of soil ingestion data, and these values should be consulted. The available data indicate that the median values for soil ingestion in children are less than 50 mg/day. Sediment ingestion is probably much les.*

6. *For the central tendency case, ELCR risk estimates slightly exceeded 1.0 E-06 for children. If the mean, rather than maximum concentrations for chemicals in sediments are used, ELCR risks would be less than 1.0 E-06.*

7. *Page 150 of Section 7.0 summarizes the risks for residents' exposure to sediment as being below the EPA target risk range. However, the risk estimates listed in Table 12 for this exposure scenario are 1.2 E-05 and 2.1 E-05 for adults and children, respectively. If the risks are truly below the target risk range, an updated table showing these risk estimates should be included in the appendices.*

V. Risks to Residents - Eating Fish

Summary of Evaluation for Reasonable Maximum Exposure

1. ELCR risks due to ingestion of fish exceeded 1.0 E-05. These risks were due primarily to the pesticide dieldrin in water. A bioaccumulation model was used to estimate body burdens in fish from the water concentration.

2. The Hazard Index for noncarcinogenic (systemic) health risk exceeded the benchmark of "1" for children in the 1 to 6 age group. This was due to estimated exposure to dieldrin and manganese.

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[5]Thompson, K.M.; Burmaster, D.E. Risk Analysis 1991, 11, 339-42.

[6]Personal communication with Edward Calabrese, University of Massachusetts at Amherst, (413) 545-3164.

Summary of Evaluation for Central Tendency Case

1. ELCR risks were slightly less than 1.0 E-05 for adults, and slightly greater than 1.0 E-05 for children.

Comments

1. *Dieldrin should not be included as a site-related chemical of potential concern for surface water or fish. Dieldrin, and other pesticides, are present in the creeks at low levels, probably as a result of historical use in agricultural applications. The concentration of dieldrin in surface water, at and below the site, was essentially the same as upstream from the site.*

2. *Manganese should not be included as a site-related chemical of potential concern for surface water or fish. Manganese concentrations in surface water, on-site and downgradient, do not appear to be elevated as compared to upstream samples. Concentrations downstream ranged from 115 ug/l to 230 ug/l, as compared to 160 ug/l to 189 ug/l for the upstream stations. This information suggests manganese concentrations in surface water may be naturally occurring, or from an upstream source.*

3. *The draft risk assessment tables do not indicate the species of fish that are being caught for White and Wine Creeks. Based on discussions with local Fish and Game personnel, it appears that Wine and White Creek are fished only occasionally (reasonable maximum exposure is expected to be less than 78 days per year) and only for fish (e.g., Salmon or Rainbow Trout) that enter the creeks from Lake Ontario to spawn. Thus, the fish that would actually be fished for in the creeks will reflect primarily Lake Ontario conditions.*

4. *The fishing frequencies for the maximum reasonable exposure (78 times per year) and central tendency (48 times per year) are probably high for this creek. It is more likely that the creek is fished on an occasional basis, near the mouth, in years when salmon or trout enter from the lake.*

5. *When all pathways are combined for surface water and sediments, the ELCR risk is still within the 1.0 E-06 to 1.0 E-04 range. However, the hazard index for children eating fish exceeds the benchmark of "1," due primarily to dieldrin and manganese.*

6. *Site-specific information is available on where fishing is likely to take place for the species of interest. When this occurs it will be primarily in the downstream stretch of White Creek below the beaver dam. Particular interest would be in those areas that are accessible to people, near Lake Ontario. Such site-specific information should be considered when identifying information and data for use in the risk assessment.*

VI. Risks to Construction/Utility Workers

Summary of Evaluation for Reasonable Maximum Exposure

1. Risks were calculated for exposures to subsurface soils during any potential future excavations outside the slurry wall. Presumably these would be related to placement or maintenance of subsurface utilities, or new construction.

2. Risks slightly exceeded 1.0 E-06, due primarily to PCBs.

Summary of Evaluation for Central Tendency Case

1. Risks slightly exceeded 1.0 E-06.

Comments

1. *The exposure variable for days-per-year specifies a relatively large number of days for the maximum reasonable exposure (195 days) and central tendency (130 days) cases. This reflects a major construction project rather than placing a utility line or pipe. Is that the intent? Based on site-specific information, there were relatively few areas where construction could occur adjacent to the site and few locations where utility lines or pipelines could be placed or serviced.*

VII. Quality Assurance Review of PAS Risk Tables

The Quality Assurance (QA) review included:

1. A QA check of the analytical data used to develop Compounds-of-Concern and Exposure Point Concentrations;

2. Review of the exposure assumptions used in the assessment; and,

3. Spot-check of the risk assessment calculation spreadsheets.

Analytical Data Tables

A Quality Assurance check was run on the data used by EPA in the human health risk assessment. These values were compared to the analytical data reported by Geraghty & Miller in both the draft "Site Summary Report" (August 1992) and revised report (November 1992). Each value used by EPA to arrive at exposure point concentrations was checked

against values presented in the Geraghty & Miller reports. This data includes surface water, groundwater, sediment and subsurface soil.

All of the data used by EPA in the draft risk assessment tables are identical to the values presented in the "Site Summary Report." Three of the values, however, differ from those presented in the "Data Validation Tables." These values are:

Media	Compound	Station	EPA Concentration	Data Validation Table Concentration
Subsurface Soil	Dieldrin	B-5	43 JP	R
Groundwater	Benzene	M-21	37	100
Groundwater	Vinyl Chloride	M-21	5 ND	14 ND

All other values appear identical to those presented in the "Data Validation Table."

PART B COMMENTS ON EPA ENDANGERMENT ASSESSMENT

Comment 1

In several areas, the assessment attributes observations or data to the Additional Ecological Assessment (Menzie-Cura, 1992) as if it were the primary source. For example:

on page 7 it attributes flow estimates to Menzie-Cura, 1992 which were not made by the authors;

on page 8, Menzie-Cura, 1992 did not make a characterization of the cap; and,

on page 80, Menzie-Cura, 1992 did not gather primary data on fish.

Comment 2

The Endangerment Assessment recognizes that the "food web" (figure 3-1) is simplistic. However, the text should elaborate on the level of simplicity. For example, the figure shows mink feeding on creek chub, short-tail shrew, and green heron, but the accompanying text does not indicate what fraction of the diet these species are likely to contribute to mink. It is important to understand these quantitative relationships in at least a relative manner, to arrive at reasonable exposure scenarios and risk characterizations.

Comment 3

The ecotoxicity profiles nearly all summarize only aquatic databases drawn from EPA's Ambient Water Quality Support Documents. There is little terrestrial data, and no attempt to develop toxicity values from literature values. In several subsequent places, the document suggests that there should be more site-specific data collected. This may not be necessary, if more effort was expended in developing toxicity values for receptor species from literature data on closely related species.

Comment 4

On page 71, the statement, "The media quality standards/guidelines have been developed to protect ecological receptors exposed to contaminated surface water or sediments" in reference to NOAA criteria, is not consistent with NOAA's description of the use of ER-L's and ER-M's. NOAA explicitly states [7] that "...guidelines were developed for use in assessing the potential for effects," not as guidelines to protect ecological receptors. NOAA further indicates that their system for using ER-L and ER-M is a relative ranking system for various sites. Long and Morgan state that "The potential for biological effects was assumed to be highest for those sites in which the sediments exceeded the individual ER-M values. The potential was assumed to be lower for those sites that exceeded many of the ER-L values, but not the ER-M values." This explicit method for using the NOAA guidelines does not suggest that a single ER-L or a single ER-M is a criteria developed to be protective of ecological receptors. Rather, it is a true weight of evidence approach which requires looking at as many contaminants as possible to develop a relative ranking and the implied opinion regarding the potential for effects

[7]Long and Morgan, 1990. The Potential for Biological Effects of Sediment-Sorbed Contaminants Tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, Washington.

Comment 5

The statement on page 71 that "However, detected PCB levels in the sediments are at levels that could affect avian and mink reproduction and cause death of sensitive invertebrate and fish" is highly speculative. In particular, a statement such as this regarding higher order predators such as birds or mink should explicitly state the underlying assumptions. For example, is this statement based upon the assumption that all of the mink's diet is derived from the site? Does it assume that all of the diet is creek chub, shrew, and green heron as implied in figure 3-1? Does it assume that the mink or green heron reside at the site, or associated wetlands, all year? The attachment to these comments is a quantitative analysis, which provides such assumptions and constraints.

Comment 6

On page 79 in the third paragraph, the statement "Characterization of risks to site ecological receptors was determined on the basis of comparison of ecotoxicological values from the literature with site surveyed contaminant levels" is misleading. The statement applies only to surface water, which is the only media for which the assessment provides ecotoxicological values.

Comment 7

On page 79, the section on invertebrates is speculative and unsupported by the information presented in the risk assessment. The authors characterizing risk to invertebrates when they are admittedly not using invertebrates as a receptor. It is contrary to EPA methodology to assess risk to a group which has not been characterized as a receptor. If status of and risk to invertebrates is uncertain, they should be discussed in the uncertainty section of the report, not the risk characterization section. The statement that "Aquatic invertebrates are most at risk to PAS site contaminants as indicated by the similarity of detected values to toxicity values," is not accurate. The only toxicity values used in the R/A are from the Ambient Water Quality Criteria (Table 4-1 in the Endangerment Assessment), and the only surface water value exceeding the AWQC is aluminum. The AWQC were developed to protect sensitive receptors, and in the present instance, all COCs except aluminum are below these very protective values. On the contrary, Table 4-1 indicates that based on comparison to ecotoxicity values, the invertebrates are unlikely to experience risk.

Comment 8

The risk characterization of fathead minnow is highly speculative. The detection of PCB in creek chub indicates that these fish have been exposed to PCB. However, the statement that this indicates a potential for risk through the food chain should be accompanied by some explanation of the underlying assumptions and a sense of the uncertainty in this statement. The issue of uncertainty in speculations such as this should be addressed in the uncertainty section.

Comment 9

The section on spring peepers does note that the pH on-site and in adjacent areas, is outside the range commonly associated with aluminum toxicity. It should also note that evidence of a mating population (i.e. spring peepers calling) has been observed on-site.

Comment 10

On page 82, the speculations regarding *mink* exposure and potential effects due to PCB's should include the assumptions behind the speculation that transfer of PCB and other COCs through the food chain "...could provide a significant exposure...". The attachment to these comments is a quantitative analysis which provides such assumptions and constraints.

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(508) 453-7260 (fax)

August 4, 1993

Project No: 265 (PAS)

To: Mark Valentine and Bob Glazier
From: Charles Menzie
Subject: EPA Comments Related to Mink Model

EPA provides two paragraphs of comments related to the mink model we applied to PCBs in sediments in White and Wine creeks. I have reviewed these comments and am providing our responses below. In some cases these involve clarifications concerning the nature of the modeling.

EPA is concerned about the degree to which the model is conservative as well as the uncertainty associated with the analysis. These are discussed under several headings:

Dietary Intake

EPA Comment: The model estimates dietary intake from food. EPA suggests that exposure may be underestimated because other sources of PCBs are not included. In particular, they mention the possibility of exposure due to incidental ingestion of sediment.

Response: The model is designed to link dietary concentrations to potential effects. This is the form of the model that has been used by EPA at other Superfund sites and is the basis for the development of the Aquatic Water Quality Criteria. Exposure via the food is expected to be the predominant source of exposure to mink that may use the White and Wine Creeks as part of

their foraging areas. Exposure to soil as a result of burrowing has not been included because the focus of the effort has been on sediments in the creek beds and because soils at the site have been capped. Because the mink preys on animals such as frogs, birds, mammals, and fish, it is not expected to dig into sediment or soil in order to obtain its prey.

Limited data exist on the amount of soil incidentally ingested by mammals. EPA in concert with U.S. Fish and Wildlife have reported out some of this information. Most of the available data are for smaller burrowing mammals. To our knowledge, there are no reported data for mink and we have not seen such information incorporated into mink models used by EPA or others.

Composition of the Diet

EPA Comment: The use of equal proportions of fish, frog, and small mammals rather than proportions adjusted for site-specific prey availability may reduce or increase estimated exposure.

Response: The use of equal proportions is a simplification but is expected to be representative and probably conservative for the site. We relied upon the literature as well as our field study of the area and that of URS as a basis for establishing a diet. In particular we considered the following:

- frogs were the most abundant vertebrates observed in White Creek during our field studies and site visits; to the extent that mink are feeding on aquatic biota, their diet is expected to be weighted heavily toward frogs and this is consistent with what is reported in the literature for mink; frogs are expected to have lower PCB body burdens than fish; therefore, by including equal proportions of frogs and fish in the diet, the model is made more conservative than what is probably actually occurring;

- fish were not observed in stretches of the White Creek above the beaver dam; these animals occur more frequently in the lower stream segments near Lake Ontario; these stream segments have lower or non-detectable PCB levels in sediments as compared to locations farther upstream; however, the model assumes that fish

are evenly distributed throughout the creeks and that mink would be exposed to PCBs in fish body burdens in locations where we know that fish are not abundant; this assumption makes the estimate of exposure more conservative than what is actually occurring;

- the one macroinvertebrate that might be present in White and Wine creeks and that mink might feed on is the crayfish; mussel beds do not occur within these small creeks; a previous study attempted to collect crayfish for tissue analysis of PCBs but could not find sufficient organisms; based on this information and our own observations of the site (which included turning over rocks to look for these animals), we have concluded that crayfish are not an important component of the diet for mink foraging along White and Wine creeks.

Selection of Toxicological Endpoints and Lifestage

EPA Comment: By using only adult mink in the analysis, potentially more sensitive life stages are excluded, as well as the potential restrictions of the foraging area during denning.

Response: The toxicological endpoint that is used in this assessment is impairment of reproduction in female mink. This has been the "critical effect" most often associated with exposure of mink to PCBs in the diet and is the basis for the EPA's Chronic Aquatic Water Quality Criterion for PCBs. Thus, the approach taken is consistent with what is generally viewed as the appropriate endpoint.

Because reproductive effects in female mink was identified as the critical endpoint, the foraging area of female minks was used as the basis for the analysis. The analysis assumes that females would be restricted to the area around White and Wine creeks.

Treatment of Non-Detect Values

EPA Comment: The assessment uses a zero value for creek segments with non-detects rather than one-half the detection limit.

Response: With a few exceptions, non-detect values were entered at one-half the detection limit. Those exceptions involved data where detection limits were not reported. If a default non-detect value of 16.5 ug/kg is substituted for "0" the exposure concentration of PCBs in food increases slightly but is still less than 640 ug/kg

Discussion of Uncertainty

EPA Comment: The mink model document does not discuss uncertainties.

Response: The mink model document does not include a formal discussion of uncertainties although such a discussion could be included. However, the document does discuss the issues related to the assumptions and does attempt to provide a conservative analysis. It is expected that the analysis overestimates actual exposure to mink. As such, the analysis provides a better and more technically sound basis for judging risk than the qualitative statements provided in EPA's risk assessment. A formal discussion of uncertainties could be included in support documentation.

Justification for Stream Divisions

EPA Comment: The justification for specific divisions used for the creek foraging segments was not presented.

Response: The division of stream segments was based on three factors: 1) physical features of the streams such that PCB data collected at one location of the stream could be representative of other locations of that stream segment; 2) the levels of PCB contamination such that segments with higher PCB concentrations in segments were not merged with segments of lower PCB concentrations; and 3) locations relative to the site. These criteria provided a logical basis for organizing the available information relative to stream morphometry, PCB levels in sediments, and proximity to the site.

Because the methodology uses a weighted-average approach, alternative divisions of the creeks would likely yield similar results.

Uncertainty Associated with Toxicity

EPA Comment: Dietary concentrations in the range of 596 ug/kg has been cited as showing severe reproductive effects in cattle.

Response: Mink are reported to be particularly sensitive to PCBs and are the most sensitive wildlife species tested for which data are available[1]. Birds and other mammals are much less sensitive. The analysis focuses on mink and uses the LOEL value used by EPA for other assessments of risks associated with exposure of mink to PCBs (640 ug/kg in the diet). We have attempted to be consistent with the approach that EPA has taken in other situations in identifying an appropriate endpoint and associated target concentration.

I could not find within Eisler, the reference made by EPA to effects on cattle.

Identification of Receptors

EPA Comment: The selection of the mink as a receptor is to show the risk to a sensitive species. While the actual presence of individual mink or a lack of population effects is a factor to consider, it is the potential for impact to site receptors, as represented by the mink and demonstrated in this assessment, which is of special concern.

Response: The mink and mink model should not be used to represent other site receptors. The mink is especially sensitive to PCBs and the toxicological data relied upon in the model were specific to mink. Data exist for other small mammals and it would be appropriate to consider that information if a quantitative analysis is contemplated for other receptors. In addition, the exposure assessment incorporated into the mink model is designed specifically for mink and would not be appropriate for other site receptors. An assessment of risks to these other receptors should be based on a consideration of their foraging habits and behavior as well as observations already reported on site conditions.

---

[1]Eisler, R. 1986. Polychlorinated biphenyl hazards to fish, wildlife, and invertebrates: a synoptic review. U.S. Fish and Wildlife Biological Report 85(1.7).

Conclusions

Ultimately, the information developed using the mink model and other evaluations will be used to determine if some form of sediment remediation is needed at this site. We offer the following comments related to that matter:

1. Based on our analysis, the risks to mink and the mink population associated with PCBs in sediments of White Creek is judged to be low. We would not recommend sediment remediation on the basis of this information.

2. Our site observations revealed that the area is supporting an apparently healthy wildlife community. These site observations do not support the need for sediment remediation at this time.

3. In our view, the primary issue related to PCBs in sediments of White Creek is the potential of an ongoing source to the sediments. In the absence of an ongoing source, natural processes should decrease the exposure levels with time and, since they do not appear to be a significant source of risk to wildlife, reliance on these natural processes is preferable to significant physical alteration of the habitat that would result from a sediment removal program.

   The potential for an ongoing source should be considered as part of the FS. If an ongoing source exists either as a result of the PAS Site or some other site, the significance of that source could be determined and appropriate actions defined.

4. In summary, we do not recommend that a sediment removal program be implemented on the basis of available information. However, we suggest that efforts be directed at identifying ongoing sources to the sediments that may need to be addressed.

F S D W A C for Environmental Concerns, Inc.

819 W. Third St.,S. - Fulton, NY 13069-3220 - (315) 592-9731

September 18, 1993

Mr. Richard Ramon, P.E.
Project Manager
Western New York Superfund Section 1
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
26 Federal Plaza
New York, New York 10278

RE: Pollution Abatement Service

Dear Mr. Ramon:

As we support the comments made by Oswego County residents at the September 8, 1993 public meeting held to discuss USEPA's preferred remedy for the PAS site, we offer the following brief comments:

1) In regards to the contaminants found outside the containment system, we believe it is the result of NYSDEC's failure, during the original RI/FS, to ascertain and accurately depict the contaminated status of the aquifer under the site, and USEPA's failure to treat and/or remove highly contaminated soils.

2) As the upgradient East Seneca Street Dump (delisted), Niagara Mohawk Fire Training School and Oswego Casting may be potential sources of contamination to the PAS site and the surrounding area, we encourage USEPA to strongly recommend to the NYSDEC that they investigate these properties in a timely fashion to rule-out these properties as potential "sources" and if confirmed, develop a binding agreement with the NYSDEC as to how and in what timeframe the agency proposes to address them before a ROD is signed for the site. To support our position, we ask USEPA to review NYSDEC's involvement at the NPL Fulton Terminals Site relative to upgradient sources.

3) Although the POTW option provides the PRPs with a cost-effective way to handle the leachate, POTW's were not designed to treat hazardous waste. We strongly object to USEPA's advocacy of the use of POTW's to remediate hazardous waste sites as the use of POTWs will add to the overall contaminant loading of Lake Ontario (a major drinking water source for millions of U.S. and Canadian

residents) and counter the intent of the GLI which calls for a reduction in the contaminant loading to the Great Lakes. We support treating the leachate on-site. In addition, we would like to direct your attention to the problems associated with the disposal of leachate from the NPL Volney Landfill Site to the City of Fulton's POTW and NYSDEC's position in the matter (see enclosed).

4) In regards to the residents of Smith's Beach, we find it appalling that the USEPA, in knowing that contaminants had migrated outside the containment area soon after the source control remedy was implemented, did nothing to confirm that all of the residents living down-gradient and in proximity to the site were connected to municipal water and took no action to increase the number of samples taken from private wells and in wetlands adjacent to their homes to safeguard their health.

In closing, we hope that we have made our position clear. Although USEPA's track record suggests that the agency will proceed with the remedy they selected for a site despite public objection, we ask USEPA to carefully consider our comments and respond accordingly.

Sincerely:

Board of Directors

Fulton Safe Drinking Water Action Committee
for Environmental Concerns, Inc.

Mary Orr

Carol Piasecki

Gene Piasecki

Robert Weston

Sandra Weston

Kathleen Wilcox

S. Elevto

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233 - 7010

Thomas C. Jorling
Commissioner

JUN 15 1989

Mr. Robert Howe
Project Manager
US Environmental
Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

Dear Mr. Howe:

Re: Volney Landfill Site
NYSDEC Site Code: 7-38-003
and
City of Fulton Water Pollution
Control Plant
SPDES Permit Number: NY0026301

Enclosed is the State Pollutant Discharge Elimination System (SPDES) Discharge Permit for the City of Fulton Water Pollution Control Plant (FWPCP) in Oswego County, New York. As per our discussion at the public availability session held on May 24, 1989, I have researched the history of the FWPCP and the general requirements for wastewater treatment plants.

The FWPCP entered into a Judicial Order (Index No. 88-422) with the State of New York on July 10, 1988. The judicial order was imposed, pursuant to the United States Environmental Protection Agency (USEPA) National Contingency Policy, as a result of the FWPCP failing to meet its SPDES discharge permit requirements.

The present upgrade ordered at the FWPCP must be completed by October 1, 1989. The discharge limits and requirements specified in the enclosed SPDES permit must be met by March 31, 1990. If any discharge limits, permit requirements, reporting deadlines or construction milestones are not met, a schedule of fines can be levied on the FWPCP in accordance with the judicial order.

In accordance with 6 NYCRR subdivision 754.4(g) and (h), prior to the acceptance of the landfill leachate, an off-site, SPDES-permitted wastewater treatment facility must notify the NYSDEC of its intention to accept the waste. This shall include qualitative and quantitative information necessary to characterize the waste. It is at the discretion of the NYSDEC to either prohibit or condition the acceptance of the waste and to modify the SPDES permit in accordance with 6 NYCRR subdivision 754.4(i) to reflect the discharge of the waste. These regulations apply to publicly owned treatment works (POTW's) as well as privately owned treatment plants.

There is a contract in place between the City of Fulton and Oswego County allowing the landfill leachate to be treated at the FWPCP. There is also a letter dated May 14, 1986 from the NYSDEC to the FWPCP approving the treatment of the landfill leachate. The FWPCP is currently not accepting the landfill leachate because the treatment required to properly treat the waste and achieve their SPDES permit limits is not yet complete.

Since approvals granted to the FWPCP by the NYSDEC were prior to the judicial order, the FWPCP must reapply to the NYSDEC upon completion of the construction required by the order. Any proposal by the FWPCP to receive landfill leachate will not be approved by the NYSDEC until the judicial order is completely fulfilled.

The FWPCP is subject to a USEPA-approved Pretreatment Program. The implementation requirements are specified as enforceable conditions of its SPDES permit. The landfill would be considered a Significant Industrial User (SIU) and would need to be issued an Industrial Discharge Permit by the City of Fulton. The discharge permit is then subjected to State review and appropriate revision, as necessary.

It should be noted that if the leachate migrating from the landfill is contaminated by a listed hazardous waste, pursuant to either the Resource Conservation and Recovery Act (RCRA) or Article 27, Title 9 of the New York State Environmental Conservation Law (ECL), the leachate may be classified as a listed hazardous waste under 40 CFR 261.3 (c)(2) or 6 NYCRR 371.1 (d)(3)(ii)(a). In that case, the sewage treatment plant which receives the leachate must comply with the permit-by-rule requirements (40 CFR 270.60 or 6 NYCRR 373-1.1 (d)(3)(iii)). The sludges generated at the sewage treatment facility may also be classified as a listed hazardous waste if any hazardous constituents, for which the leachate would qualify as a listed hazardous waste, are found in the sludge. Shipments of leachate would have to be manifested and a transporter, licensed under 6 NYCRR Part 364, would be required.

A decision is currently being made by the USEPA and the NYSDEC on whether or not the leachate is classified as a listed hazardous waste under RCRA or the ECL. [The decision to accept the waste, and the potential RCRA implications at the treatment plant from that acceptance, lies with the treatment plant.]

Please call me at (518) 457-5677 if you have any questions.

Sincerely,

Mark D. Kauffman
Assistant Sanitary Engineer
Central Remedial Projects Section
Bureau of Eastern Remedial Action
Div. of Hazardous Waste Remediation

Enclosure

cc: J. Singerman - USEPA - Region II
S. Patane - City of Fulton Engineer
E. Walsh - Oswego County Health Department
C. Rush - Oswego County Public Administrator
S. Weston - Fulton Safe Drinking Water Action Committee
M. Austin - Volney Town Board
C. Rose - Volney Town Board

Citizens Environmental Coalition

33 Central Avenue, Albany, New York 12210

518-462-5527

Richard Ramon, P.E.
Project Manager
Western New York Superfund, Section 1
Emergency & Remedial Response Division
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26 Federal Plaza
New York, New York 10278

September 21, 1993

Dear Mr. Ramon:

Citizens' Environmental Coalition strongly opposes the EPA's proposal to discharge hazardous waste from the Pollution Abatement Services (PAS) Superfund site in Oswego, New York into a local sewage treatment facility. Sewage treatment facilities are not equipped to handle hazardous wastes. Disposing of hazardous waste into such a facility will cause additional environmental contamination. Currently, New York is allowing sludge to be spread on agricultural lands. Sludge contaminated with hazardous wastes could then be spread on land and may eventually cause groundwater or surface water contamination. We strongly support the Fulton Safe Drinking Water Action Committee's recommendation to conduct waste treatment at the site.

CEC is a statewide organization of over 90 community and environmental organizations working on pollution problems in New York State. Since 1983, we have worked to upgrade the Federal and State Superfund programs. We are especially concerned about recent governement proposals to use sewage treatment plants for toxic waste disposal. We believe the environmental and public health risks caused by disposal of hazardous waste into a sewage treatment plant are significant and justify a prohibition on their use. I would be happy to provide you with information on the serious contamination of sewage sludge which already exists in New York State today, as well as the state programs allowing its use on agricultural lands. We urge EPA to withdraw their proposal to use the sewage treatment plant for any hazardous waste from the site, and to support on-site waste treatment.

Thank you for your anticipated consideration. I look forward to hearing from you.

Sincerely,

Anne Rabe

Anne Rabe
Executive Director