**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

Interim Final 2/5/99

**RCRA Corrective Action**
**Environmental Indicator (EI) RCRIS code (CA725)**
**Current Human Exposures Under Control**

**Facility Name:** **Solvents and Petroleum Service, Inc.**
**Facility Address:** **SYRACUSE, NEW YORK**
**Facility EPA ID #:** **EPA ID # NYD013277-454**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

**__X__** If yes - check here and continue with #2 below.

**_____** If no - re-evaluate existing data, or

**_____** if data are not available skip to #6 and enter "IN" (more information needed) status code.

## BACKGROUND

### Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

### Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

### Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

### Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

| | Yes | No | ? | Rationale / Key Contaminants |
|---|---|---|---|---|
| Groundwater | _X_ | ___ | ___ | **VOCs and Petroleum Compounds(TCE & others) at ppm levels** |
| Air (indoors)[2] | ___ | _X__ | ___ | **See attached information.** |
| Surface Soil (e.g., <2 ft) | ___ | _X_ | ___ | |
| Surface Water | ___ | _X__ | ___ | |
| Sediment | ___ | _X__ | ___ | |
| Subsurf. Soil (e.g., >2 ft) | _X__ | ___ | ___ | **VOCs and Petroleum Compounds** |
| Air (outdoors) | ___ | _X__ | ___ | |

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X___ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

Rationale and Reference(s):

## Site Background

The SPS facility is located at 1405 Brewerton Road in Syracuse, NY. The facility is located adjacent to a slowly flowing backwater segment of Ley Creek, a small stream that discharges into Onondaga Lake, (see Figure 1, Figure 2).

Prior to ownership of the facility by SPS for use as a virgin solvents distributor in 1977, the site was occupied by several commercial enterprises which may have released hazardous constituents to the groundwater at the facility. In the 1940s, the site was occupied by a gas station, a car repair shop and a car wash which occupied Building 2. In 1954, M.V. Whitaker, a Syracuse businessman who delivered virgin solvents to local clients relocated his business to the site and constructed Building 1. These two companies coexisted at the site until the early 1970s, at which time the gas station closed and the underground storage tanks (USTS) were removed. M.V. Whitaker expanded its operation to include Building 2 for solvent storage. In 1980, SPS applied for, and was granted status as a Treatment, Storage and Disposal Facility (TSDF) and as a transporter of hazardous waste.

The current owner, SPS, is a distributor of organic and chlorinated solvents to industries in the Central New York region. Solvents are stored in above-ground steel or stainless steel tanks, either in buildings or in open sided pavilions . In 1979, operations were expanded to include the collection and storage of drummed spent solvents from existing customers. SPS is strictly a storage facility for hazardous wastes with no on-site processing other than aggregation of spent solvents for off-site transport. SPS has a NYS Waste Haulers Permit.

In 1981, SPS applied for and received a Permit to Operate a Solid Waste Management Facility from NYSDEC. SPS also has a USEPA RCRA Part B Permit, identification number NYD013277-454.

Hazardous wastes are collected from clients and temporarily stored on-site prior to off-site disposal. Hazardous wastes are stored in three areas: a storage area for non-ignitable containerized wastes (Building 2), a storage area for ignitable containerized wastes (Building 1), and four 5,000 gallon transfer tanks. The four 5,000 gallon tanks are used to store the following hazardous wastes: flammable waste liquid, waste trichloroethene (TCE), waste 1,1,1-trichloroethane, and the fourth tank is held in reserve for emergencies. The non-ignitable storage area has a capacity of 40 55-gallon drums. The ignitable storage area (Building 1) has a capacity of 20 55-gallon drums. All wastes are received by SPS in drums. SPS personnel manually transfer liquids from the drums to the four 5,000 gallon waste storage tanks. SPS has specific written procedures which are used when commingling wastes from various clients.

In addition, SPS has several trailers staged at the north end of the property for container storage. The areas of the site not occupied by buildings or storage tanks have been covered with asphalt or concrete. The western portion of the site consists of a large concrete slab on grade that serves as a secondary containment pad. The containment pad drains to a sump along the north side of the property. A chain-link fence to control site access surrounds the facility.

When sufficient quantities of waste have accumulated, the material is shipped via a registered waste hauler to a USEPA and NYSDEC permitted recycler. At this point SPS becomes a hazardous waste generator. All wastes shipped off-site are sent to reclamation facilities or fuel blending operations.

Since 1985, two minor spills of solvents have been reported on the SPS property. The spills involved less than 100 gallons of solvents and SPS made efforts to contain and cleanup the spills. Because of these reported spills and the historical uses of the property, the impact to groundwater quality has been under investigation since the early 1990's. Investigations conducted at the site include:

*Hydrogeologic Investigation*, 1993, O'Brien & Gere Engineers

- *Groundwater Monitoring Program,* 1993-present, Various Consultants
- *Comprehensive Groundwater Monitoring Evaluation*, NYSDEC 1997
- *Feasibility Study Report*, 1999, Environmental Products & Services, Inc.
- *RCRA Facility Investigation Report*, 1999, CHA.
- *Corrective Measures Study Report*, 2001, CHA

Additionally, Clough, Harbour & Associates LLP (CHA) has conducted a Remedial Investigation (RI) of the former Town of Salina Landfill, which has been listed as a Class 2 Inactive Hazardous Waste Site. The Town of Salina Landfill is located along the north side of the property, immediately adjacent to Ley Creek. Information (publicly available) from the landfill site investigation that is pertinent to the SPS site has been reviewed in considering potential environmental impacts to Ley Creek.

**SITE INFORMATION** ( see Corrective Measures Study, CHA 2001)

The subsurface of the SPS site has been characterized from the drilling and installation of a number of monitoring wells and piezometers. O'Brien & Gere Engineers installed four (4) monitoring wells in 1993 (MW-1S, MW-2S, MW-3S, and MW-4S) and Environmental Products and Services installed a recovery well (RW-1) and a piezometer (P-1) in 1998. The boring logs from these wells and piezometers indicate that portions of the site are underlain by fill. Where fill materials are absent, the subsurface deposits consist of silts and fine sands to a depth of approximately 20 feet below grade at the southern portion of the site (MW-1S) and up to 30 feet below grade at the northern end of the site (P-1). A dense glacial till underlies the silt and sand deposits encountered at that depth.

Based on information from borings drilled on the adjacent Town of Salina Landfill site, the uppermost sand unit encountered beneath the SPS site appears to be of uniform thickness and somewhat continuous in nature. The lower sand unit, encountered only in piezometer P-1 on the SPS site, is discontinuous in nature. This unit does appear to thicken to the southwest, toward Onondaga Lake, in the vicinity of the landfill (See Figure 3 for location of borings/wells on both the SPS site and the Town of Salina Landfill and Figure 4 for a representative cross-section.)

The depth to groundwater on the SPS site has been measured at approximately 4 to 5 feet below grade during sampling events. Given the depth to till of approximately 20 to 30 feet below grade, this would indicate that the saturated thickness of the water table aquifer is a maximum of 25 feet. Groundwater on the site flows to the north apparently discharging to the backwater tributary to Ley Creek (See Figure 5). The hydraulic gradient across the site is approximately 0.03 ft./ft. A groundwater contour map prepared for the Town of Salina Landfill site (See Figure 6) shows that the main stem of Ley Creek is the apparent discharge point for groundwater beneath the landfill; with groundwater flowing to the south on the north side of Ley Creek and groundwater flowing to the north on the south side of Ley Creek. Note that the data used to prepare the two groundwater flow maps was collected in different seasons so it would be inappropriate to show the information on the same map.

The following table summarizes the hydraulic characteristics for the site discussed in the RCRA Facility Investigation Report (prepared by CHA in 1999):

**Table 1. Site Hydrological Characteristics.**

| Hydrological Characteristic | Value |
|---|---|
| Apparent Groundwater Flow Direction | North |

| Hydrological Characteristic | Value |
|---|---|
| Approximate Depth to Groundwater | 4-5 ft. |
| Depth to Till/Aquitard | 20-30 ft. |
| Assumed Saturated Aquifer Thickness | 25 ft. (maximum) |
| Assumed Porosity | 0.15 or 15% |
| Hydraulic Gradient | 0.03 ft./ft. |
| Hydraulic Conductivity | 0.48 ft./day or $3.3x10^{-4}$ ft./min. |
| Transmissivity | 12 $ft.^2$/day |
| Average Linear Velocity of Groundwater | $9.6x10^{-2}$ ft./day or 35 ft./year |

**Groundwater Quality**

Groundwater samples from the facility have been collected and analyzed since 1993. A copy of an analytical summary data table is included as Table 2. In general, the analytical results for each of the sampling years are similar. It should be noted, however, that the concentration of VOC's in replacement well 4R (1997,1999) were markedly higher than the concentrations of contaminants in the historical database from the other wells.

The highest levels of aromatic hydrocarbons are present at background monitoring well MW-IS. MW-IS is located in the vicinity of the former gasoline station USTs. Benzene has been reported at concentrations ranging from 1,800 micrograms per liter (ppb) to 2,700 /ppb. Toluene has been reported at concentrations ranging from 140 ppb to 350 ppb. Ethylbenzene has been reported at concentrations ranging from < *100* ppb to 780 ppb. Xylenes have been reported at concentrations ranging from 1,300 ppb to 3,800 ppb. The NY State groundwater standards for each of these parameters are 5 /ppb or less. It should be noted that chlorinated volatile organic compounds (vinyl chloride, 1,2-DCE, 1,1-DCA, and TCE) were not detected at this monitoring well from 1993 through 1999.

The historical analytical results from monitoring well MW-2S indicate minor exceedances of VOCS, which for the most part appear to be decreasing in concentration. Benzene has been reported at concentrations of < 1 ppb to 10 ppb (0.7 ppb standard). Vinyl chloride has been reported at concentrations ranging from < 1 ppb to 20 ppb (2 ppb standard), and appears to be decreasing in concentration with time. 1,2-DCE and 1,1-DCA were reported slightly above the NY State groundwater standards (5 ppb) in 1993 and 1994 but were reported below the standards since 1995.

Analytical results from monitoring well MW-3S reported VOCs below the method detection limits for groundwater samples collected during 1993. The 1994 analytical results reported a minor exceedance of benzene. Results from 1995 groundwater samples reported trace amounts of 1,2-DCE. The 1996 analytical results reported a minor exceedance of benzene and a significant increase in the concentration of 1,2-DCE. Since then, the concentrations of those compounds have diminished.

Monitoring well MW-4S is located in a position most directly downgradient of the solvents management area. Historical analytical results reported minor exceedances of benzene, xylene,

chloroethane and trichloroethene. When MW-4S was deepened and renamed MW-4R in 1997, the concentrations of vinyl chloride and 1,2-DCE increased by over 100 times. Since that time the measured concentrations of VOC have decreased considerably (Figure 8).

P-1 is approximately 20 feet up gradient of MW-4S. The concentration of 1,2-DCE was 6 g/L and the concentration of vinyl chloride was 11 g/L in the March 2001 sampling event; significantly lower than the concentrations in MW-4S. No BTEX compounds have been detected in P-1 in excess of NYS groundwater standards.

RW-1: Benzene has been detected in this recovery well located between well MW-4S and piezometer P-1, but the concentration has remained fairly uniform, between 4 g/L and 5 g/L. The concentration of TCE daughter products has increased through time, but remains below ppm levels.

In order to better define the extent of the contaminant plume, temporary well point WP-3.5 was installed midway between wells MW-3S and MW-4S and temporary well point WP-4.5 was installed to the east of MW-4S. These well points were sampled for 1,2-DCE and vinyl chloride only. The results indicate that these compounds were not detected or detected at low levels, suggesting that well MW-4S is located in the middle of the plume of groundwater contaminated with VOCs.

SPS has attributed the presence of chlorinated compounds such as vinyl chloride, 1,2-DCE and 1,1-DCA reported in monitoring wells MW-2S, MW-3S, MW-4S and MW-4R to TCE biodegradation and dispersion processes. However, they do not specify the source or location of these contaminants.

It is significant to note that these chlorinated compounds were not detected in monitoring well MW-1S. Therefore, it is unlikely that the former gasoline USTs are the source of these chlorinated compounds. It appears that the source of these chlorinated compounds is from a location downgradient of MW-1S that would allow it to disperse to the other three monitoring wells. A likely source of these chlorinated compounds would be past leaks and/or spills of the virgin and spent solvents that have been historically handled at the site.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

| | Potential **Human Receptors** (Under Current Conditions) | | | | | | |
|---|---|---|---|---|---|---|---|
| **"Contaminated" Media** | Residents | Workers | Day-Care | Construction | Trespassers | Recreation | Food[3] |
| Groundwater | No | No | No | No | No | No | No |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Air (indoors) | No | No | No | No | No | No | |
| Soil (surface, e.g., <2 ft) | No | No | No | No | No | No | No |
| Surface Water | No | No | No | No | No | No | No |
| Sediment | No | No | No | No | No | No | No |
| Soil (subsurface e.g., >2 ft) | No | No | No | No | No | No | No |
| Air (outdoors) | No | No | No | No | No | No | No |

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

__**X**___ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation. ***(See note below regarding Bloody Brook sediments and indoor air.)***

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s): Although VOC contaminants are present in the groundwater, there are no exposures pathways to that contamination. The facility and surrounding community are on public water system. The plume of contaminants is narrow and the shallow groundwater is relatively clean. There are no buildings above or downgradient of the plume(they are upgradient), thus indoor air contamination from the groundwater plume is not an issue. Site groundwater does discharge to a slow flowing backwater of Ley Creek, but surface water and sediment sampling indicate that SPS has not had a measurable impact on those media. (Although it is likely that the closed landfill which is on the other side of the backwater has had an impact.) The entire facility is either paved or the site of buildings, thus there are no current exposure pathways to the contaminated soils. Overall, the nature and distribution of groundwater contaminants suggest that the source of the plume is a past spill of TCE which is undergoing natural degradation. There does not appear to be an ongoing source of TCE to the groundwater.

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be

**"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

__ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

__ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s): (See references listed above.)

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment). (For groundwater and soil pathways

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

-------- If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s): Further evaluation is necessary for Indoor Air and for Bloody Brook sediments.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_X_ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **Solvents and Petroleum**

**Services**_ facility, EPA ID #**# NYD013277-454**_, located at Syracuse_ under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

_ IN - More information is needed to make a determination.

Completed by (signature)_____ Date September 18, 2001
(print) William E. Wertz, Ph.D.
(title) Senior Engineering Geologist

Supervisor (signature)_____ Date
(print) Paul J. Merges
(title) Director, Bureau of Radiation & Hazardous Site Management
(EPA Region or State) NYSDEC

Locations where References may be found:

NYSDEC
Division of Solid and Hazardous Materials
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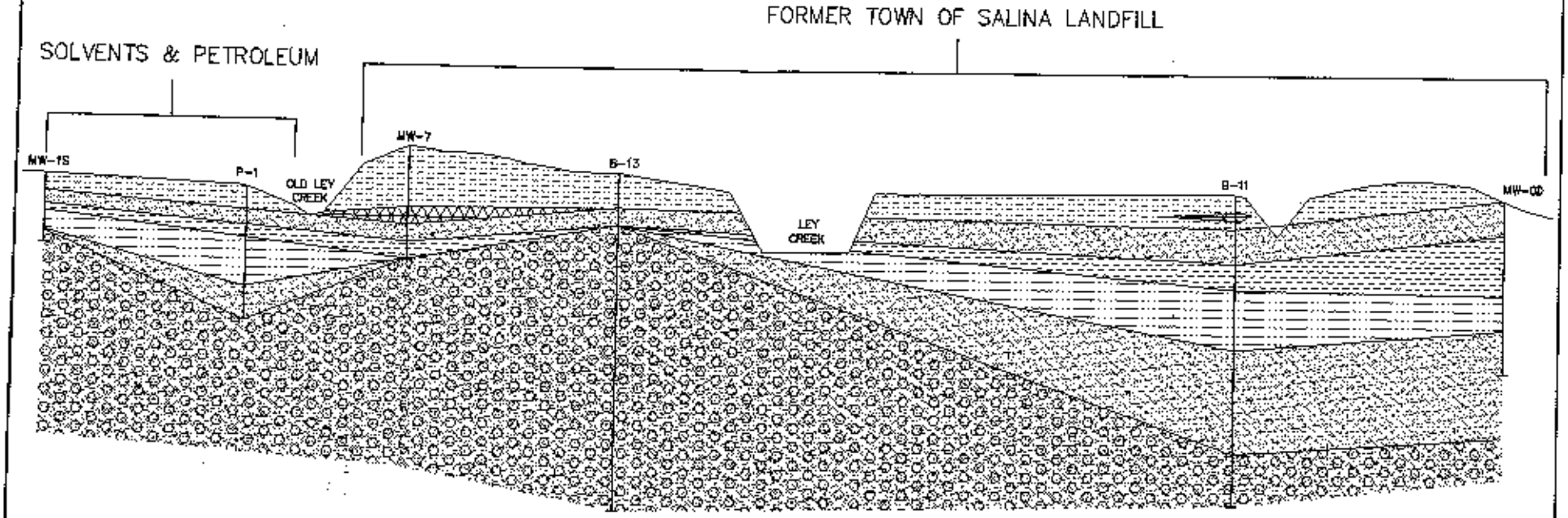
**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**

| | | MW-4R | | | | | | | WP-3.5 | WP-4.5 | P-1 | | | | RW-1 | | | SW-1 | SW-2 | SW-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jul-95 | Jun-96 | Dec-97 | Sep-99 | Feb-00 | Apr-00 | Aug-00 | Nov-00 | Mar-01 | Jun-97 | Oct-97 | Dec-98 | Sep-99 | Nov-00 | Mar-01 | Dec-98 | Jan-99 | Sep-99 | Sep-99 | Sep-99 | Sep-99 |
| | | | | | | | | | | | | | | | | | | | | |
| <10 | **4** | **15** | <300 | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | <3 | <0.5 | <0.5 | **4** | **4.7** | **5** | <3 | <3 | <3 |
| <10 | <10 | **12** | <300 | <250 | <50 | <250 | <250 | <250 | NA | NA | 1.4 | <3 | <0.5 | <0.5 | <1 | <1 | <3 | <3 | <3 | <3 |
| <10 | <10 | <5 | <300 | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | <3 | <0.5 | <0.5 | <1 | <1 | <3 | <3 | <3 | <3 |
| <30 | 2 | <5 | <300 | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | <3 | <0.5 | <0.5 | <1 | <1 | <3 | <3 | <3 | <3 |
| | | | | | | | | | | | | | | | | | | | | |
| <10 | <10 | 24 | <300 | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | <3 | 3 | 2 | <1 | <1 | <3 | <3 | <3 | <3 |
| | | | <300 | <250 | <50 | <250 | <250 | <250 | | | <1 | <3 | 4 | <0.5 | | | | | | |
| **110** | **180** | **49160** | **12000** | **6800** | **3000** | **7600** | **9900** | **3000** | <1 | <1 | **250** | <3 | 3 | **6** | **10** | **16** | **24** | <3 | <3 | 3 |
| ND | ND | **120** | <300 | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | <3 | <0.5 | <0.5 | <1 | <1 | <3 | <3 | <3 | <3 |
| <10 | <10 | **1000** | <300 | <250 | **58** | <250 | <250 | <250 | NA | NA | **8.1** | <3 | <0.5 | <0.5 | <1 | 1.1 | <3 | <3 | <3 | <3 |
| <10 | 19 | <10 | <300 | <250 | <50 | <250 | <250 | <250 | NA | NA | <5 | <3 | <0.5 | <0.5 | 43 | 57 | 110 | <3 | <3 | <3 |
| | | | <300 | <250 | <50 | <250 | <250 | <250 | | | <5 | <3 | <0.5 | <0.5 | | | <3 | <3 | <3 | <3 |
| **78**** | **210** | **21000** | **8200** | **2000** | **1300** | **3100** | **5100** | **1000** | **3.1** | <1 | **210** | **5** | 0.6 | **11** | **12** | **34** | **120** | <3 | <3 | <3 |
| | | | **410** | <250 | **1401** | **16001** | **1100** | **4301** | | | <1 | <3 | 0.71 | <0.5 | | | | | | |
| | | | <300 | <250 | **320** | <250 | <250 | <250 | | | <1 | <3 | <0.5 | <0.5 | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| ND | ND | ND | <1000 | NA | NA | NA | NA | NA | ND | ND | **110** | <10 | NA | NA | 910 | 25 | <3 | <3 | 36 | <10 |
| ND | ND | ND | <1000 | NA | NA | NA | NA | NA | ND | ND | ND | <10 | NA | NA | 61 | 15 | <10 | <10 | <10 | <10 |
| ND | ND | <5 | NA | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | NA | <0.5 | <0.5 | 2.2 | 2.6 | NA | NA | NA | NA |
| ND | ND | <5 | NA | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | NA | <0.5 | <0.5 | 1.5 | 2 | NA | NA | NA | NA |
| ND | ND | <5 | NA | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | NA | <0.5 | <0.5 | <1 | <1 | NA | NA | NA | NA |
| ND | ND | <5 | NA | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | NA | <0.5 | <0.5 | <1 | <1 | NA | NA | NA | NA |
| ND | ND | <5 | NA | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | NA | <0.5 | <0.5 | 5 | 9.7 | NA | NA | NA | NA |
| ND | ND | <5 | NA | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | NA | <0.5 | <0.5 | <1 | <1 | NA | NA | NA | NA |
| ND | ND | <5 | NA | <250 | <50 | <250 | <250 | <250 | NA | NA | NA | NA | <0.5 | <0.5 | <1 | <1 | NA | NA | NA | NA |
| ND | ND | <5 | NA | <250 | <50 | <250 | <250 | <250 | NA | NA | <1 | NA | <0.5 | <0.5 | <1 | <1 | NA | NA | NA | NA |
| | | | | | | | | | | | | | | | | | | | | |
| NA | NA | NA | 500 | NA | NA | NA | NA | NA | NA | NA | NA | 250 | NA | NA | 399 | 496 | 400 | NA | NA | NA |
| NA | NA | NA | 370 | NA | NA | NA | NA | NA | NA | NA | NA | 250 | NA | NA | 125 | 170 | 160 | NA | NA | NA |
| NA | NA | NA | 1500 | NA | NA | NA | NA | NA | NA | NA | NA | 2300 | NA | NA | 782 | 790 | 1100 | NA | NA | NA |
| NA | NA | NA | 190 | NA | NA | NA | NA | NA | NA | NA | NA | 1100 | NA | NA | 104 | 21.7 | 250 | NA | NA | NA |
| NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 6.6 | 8.3 | NA | NA | NA | NA |
| NA | NA | NA | 270 | NA | NA | NA | NA | NA | NA | NA | NA | 450 | NA | NA | 216 | 197 | 200 | NA | NA | NA |
| NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.025 | <0.025 | NA | NA | NA | NA |
| NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 41.6 | 20.1 | NA | NA | NA | NA |
| NA | NA | NA | 34 | NA | NA | NA | NA | NA | NA | NA | NA | 49 | NA | NA | 26.8 | 23 | 20 | NA | NA | NA |
| NA | NA | NA | 81 | NA | NA | NA | NA | NA | NA | NA | NA | 43 | NA | NA | 46 | 49.1 | 48 | NA | NA | NA |
| NA | NA | NA | 11 | NA | NA | NA | NA | NA | NA | NA | NA | 13 | NA | NA | NA | NA | 11 | NA | NA | NA |
| NA | NA | <0.005 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| NA | NA | 0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | | | | | | | | | | | | | | | | | | | | |
| <100 | <100 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |




SCALE

HORIZONTAL: 1"=80'
VERTICAL: 1"=20'

LEGEND

SAND | SILT AND CLAY | SAND AND SILT
CLAY | DEBRIS/WASTE | TILL

CLOUGH, HARBOUR & ASSOCIATES LLP
ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS
441 SOUTH SALINA ST. SYRACUSE, NEW YORK 13209

SCALE: AS SHOWN | DATE: JULY 2001

FIGURE 4
GEOLOGICAL CROSS-SECTION
SOLVENTS & PETROLEUM SERVICES INC.
TOWN OF SALINA, NEW YORK

FIGURE 7
BTEX CONCENTRATIONS IN MW-1S
SOLVENTS AND PETROLEUM SERVICES, INC.

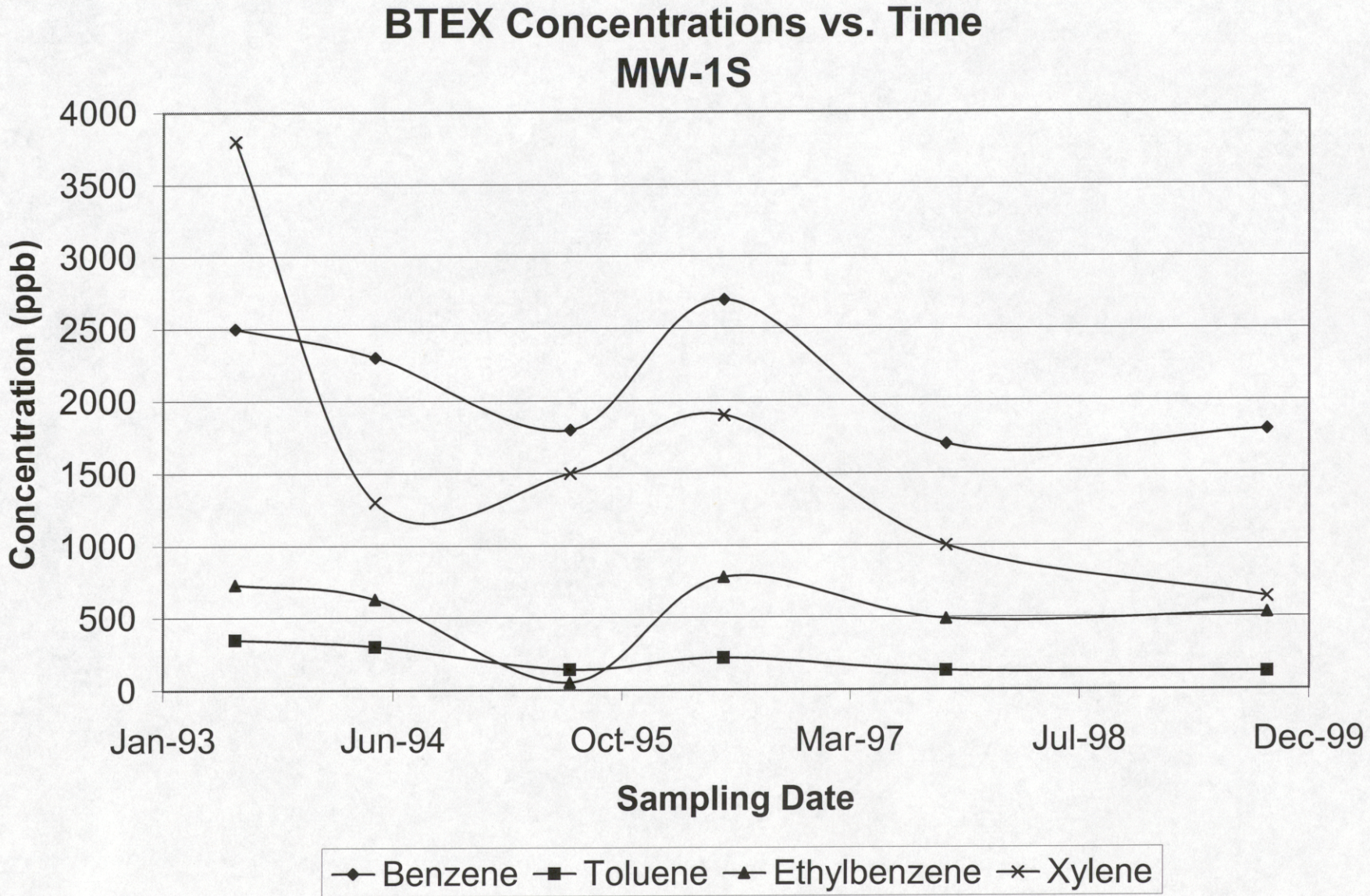


FIGURE 8
CAH CONCENTRATIONS IN MW-4R
SOLVENTS AND PETROLEUM SERVICE, INC.