SDMS Document
95448

RECORD OF DECISION

Operable Unit One (Groundwater)

Pohatcong Valley Groundwater Contamination Superfund Site

Washington Borough, Washington Township, Franklin Township

Warren County, New Jersey

United States Environmental Protection Agency

Region II

July, 2006

DECLARATION STATEMENT

RECORD OF DECISION

SITE NAME AND LOCATION

Pohatcong Valley Groundwater Contamination Site (EPA ID# NJD981179047)
Washington Borough, Washington Township, Franklin Township, Warren County, New Jersey
Operable Unit 1

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedy to address groundwater contaminated with trichloroethylene (TCE) and tetrachloroethene (PCE) at the Pohatcong Valley Groundwater Contamination Superfund Site, in Warren County, New Jersey (Site). The remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act, as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the Administrative Record file for the Site.

The State of New Jersey concurs with the selected groundwater remedy.

ASSESSMENT OF THE SITE

The response action selected in this Record of Decision (ROD) is necessary to protect public health, welfare or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

This is the first remedial phase, or operable unit, for the Pohatcong Valley Groundwater Contamination Site, designated as Operable Unit 1 (OU1). The Selected Remedy described in this document addresses the remediation of TCE and PCE-contaminated groundwater within OU1. A remedy that addresses soils contamination will be selected in a subsequent ROD. In addition, a Remedial Investigation and Feasibility Study (RI/FS) is underway in the downgradient portion of the Pohatcong Valley in parts of Franklin and Greenwich Townships, to address the nature and extent of groundwater contamination in this portion of the Valley, designated as OU2. An additional remedial action will be selected to address this contamination in a future ROD.

The major components of the OU1 Selected Remedy include:

- Pumping the most contaminated part of the TCE and PCE groundwater plumes using a series of extraction wells near the downgradient edge of the suspected soils source areas. For TCE, this will be implemented at the approximate location of the 500 parts per billion (ppb) isoconcentration isopleth of TCE; and for PCE, the location of an extraction well will be in the approximate center of the PCE groundwater plume.

- Treatment of extracted water to meet the New Jersey Groundwater Quality Standards (NJ GWQSs) of 1 ppb for TCE and 1 ppb for PCE using air stripping (transferring TCE and PCE from liquid to vapor phase) prior to reinjection into the regional aquifer; and

- Long-term monitoring of natural attenuation for target compound list VOCs and SVOCs, and target analyte list metals, in the downgradient portions of the OU1 TCE and PCE plumes to determine whether these contaminants are meeting the appropriate NJ GWQSs, or Maximum Contaminant Levels (MCLs), whichever is lower; and

- Institutional controls, such as the implementation of a Classification Exemption Area to further restrict the use of groundwater within the OU1 area until the aquifer is restored.

The Selected Remedy will be the final remedy for the contaminated groundwater in the OU1 area.

DECLARATION OF STATUTORY DETERMINATIONS

Part 1: Statutory Requirements

The Selected Remedy is protective of human health and the environment, complies with federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The Selected Remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

Part 2: Statutory Preference for Treatment

The Selected Remedy for groundwater will meet the statutory preference for the use of remedies that employ treatment that

reduces toxicity, mobility or volume as a principal element.

Part 3: Five-Year Review Requirements

The Selected Remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but may take more than five years to attain the remedial action objectives and cleanup levels for the groundwater. Therefore, a policy review may be conducted within five years of construction completion for OU1 to ensure that the groundwater remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record for this Site.

- Chemicals of concern and their respective concentrations may be found in the "Site Characteristics" section.
- Baseline risk represented by the chemicals of concern may be found in the "Summary of Site Risks" section.
- A discussion of cleanup levels for chemicals of concern may be found in the "Remedial Action Objectives" section.
- A discussion of source materials constituting principal threats may be found in the "Principal Threat Waste" section.
- Current and reasonably-anticipated future land use assumptions are discussed in the "Current and Potential Future Site and Resource Uses" section.
- Potential land uses that will be available within the OU1 Area as a result of the Selected Remedy are discussed in the "Current and Potential Future Site and Resource Uses" section, and the "Remedial Action Objectives" section.
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs are discussed in the "Description of Alternatives" section.
- Key factors that led to selecting the remedy (i.e., how the Selected Remedy provides the best balance of tradeoffs with

respect to the balancing and modifying criteria, highlighting criteria key to the decisions) may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

7/13/06

George Pavlou, Director
Emergency and Remedial Response Division
EPA Region II

Date

DECISION SUMMARY

Operable Unit One (Groundwater)

Pohatcong Valley Groundwater Contamination Superfund Site

Washington Borough, Washington Township, Franklin Township

Warren County, New Jersey

United States Environmental Protection Agency

Region II

July, 2006

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TABLE OF CONTENTS

	page
SITE NAME, LOCATION AND DESCRIPTION	1
SITE HISTORY AND ENFORCEMENT ACTIVITIES	1
HIGHLIGHTS OF COMMUNITY PARTICIPATION	3
SCOPE AND ROLE OF THIS OPERABLE UNIT	3
SUMMARY OF SITE CHARACTERISTICS	4
CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES	11
SUMMARY OF SITE RISKS	11
REMEDIAL ACTION OBJECTIVES	16
DESCRIPTION OF REMEDIAL ALTERNATIVES	16
EVALUATION OF ALTERNATIVES	21
PRINCIPAL THREAT WASTE	26
SELECTED REMEDY	26
STATUTORY DETERMINATIONS	27
DOCUMENTATION OF SIGNIFICANT CHANGES	30
GLOSSARY	31

APPENDICES

APPENDIX I	FIGURES
APPENDIX II	TABLES
APPENDIX III	ADMINISTRATIVE RECORD INDEX
APPENDIX IV	STATE CONCURRENCE LETTER
APPENDIX V	RESPONSIVENESS SUMMARY

SITE NAME, LOCATION AND DESCRIPTION

The Pohatcong Valley Groundwater Contamination Site encompasses approximately 8.75 square miles (5,600 acres) in Warren County, New Jersey, consisting of rural, industrial, commercial, municipal, farm, and residential land located within the Pohatcong Valley. The OU1 Area includes portions of Washington Borough, Washington Township, and Franklin Township, in Warren County (see Appendix I, Figure 1). Pohatcong Valley is a northeast-southwest trending valley that is bounded by mountains, is part of the Delaware River watershed, and is drained by Pohatcong Creek and associated tributaries.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Operations and State and Federal Response Actions

Chlorinated volatile organic compounds (VOCs), specifically tricholorethylene (TCE) and perchloroethylene (PCE), were detected in groundwater from two public potable water supply wells in Washington Township in the late 1970s. The two potable-water supply wells are known as the Vannatta Street well and the Dale Avenue well. TCE and PCE were detected in groundwater samples collected from the Vannatta Street well in July 1978 at concentrations of 1.7 parts per billion (ppb) and 8.3 ppb, respectively. At the Dale Avenue well, only TCE was detected in groundwater samples collected in early 1979, at concentrations between 44 ppb and 160 ppb. Corrective actions were taken at these public potable water supply wells.

After subsequent investigations conducted by the Warren County Department of Health and the New Jersey Department of Environmental Protection (NJDEP), the NJDEP installed public water supply connections to the homes and businesses within the contaminated area of Washington Township in 1989; however, there have been reports that some residents chose not to have their wells sealed, and several irrigation and farm wells may remain open.

EPA included the Site on the National Priorities List (NPL) on March 31, 1989. In 1989, EPA completed surveys of industrial properties within the Site. The objective of these surveys was to determine which industrial properties could be potential sources of the TCE and PCE groundwater contamination, and should undergo investigation during the field work phase of the RI. Following these surveys, between August and September 1997, EPA reviewed historical information available at NJDEP, Warren County and EPA Region 2 files on the identified 107 Potential Source

Areas (PSAs). The findings from these reviews were presented in the form of a Potential Source Areas (PSA) Profiles Report, which consisted of the 1989 Industrial Survey Findings and the 1997 File Review Findings, which provided recommendations for follow-up PSA site inspection, field investigation, or no further action. EPA further reviewed the profiles and defined a rationale to include or eliminate sites for investigation based on location, the history of previous studies and investigations, and use of chlorinated solvents (i.e., containing chlorinated VOCs).

EPA initiated Preliminary Remedial Investigation (RI) work in the early 1990s, which included reviewing Site background information from the Warren County Department of Health and the NJDEP, and developing an initial list of 107 PSA facilities to be evaluated as possible sources of chlorinated VOCs and other contaminants. EPA issued over 100 information request letters to facilities, and conducted site visits.

In 1999, EPA brought on a new contractor to perform the full range of OU1 Remedial Investigation and Feasibility Study (RI/FS) activities, including the delineation of the nature and extent of Site-related contamination, and evaluation of the potential human health and ecological risks based on the occurrence and distribution of Site-related contaminants detected in the OU1 Study Area. Based on further evaluation of the 107 original PSAs identified, EPA selected 37 PSAs and investigated them in three separate phases identified as Phases 1A, 1B, and 2. The investigation was designed to determine if any PSAs were contributing to the regional chlorinated VOC groundwater contamination within the OU1 Study Area. In addition, as the RI progressed, 8 new PSAs were identified and added to the field investigations, for a total of 45 PSAs investigated. After Phases 1A and 1B were completed, 16 PSA facilities were retained and evaluated as part of Phase 2 comprehensive field work.

Enforcement Activities

In 2004, based on the results of RI work, the owners/operators of three facilities were issued general notice letters of liability informing them that they were Potentially Responsible Parties (PRPs) for the Site contamination. Within the RI Report, the FS Report, and in the Proposed Plan, these parties are designated as: American National Can (ANC), L&L Econowash Cleaners (LNL), and Modern Valet Services (MVS). The locations of these facilities are shown on Figure 2 (see Appendix I).

HIGHLIGHTS OF COMMUNITY PARTICIPATION

Throughout the Site investigation process, EPA has worked closely with public officials and other interested members of the community.

The Proposed Plan and supporting documentation for OU1 were released to the public for comment on July 27, 2005. These documents were made available to the public at the Warren County Department of Health Offices, 315 West Washington Avenue, Washington Borough, New Jersey; as well as at the EPA Superfund Records Center, 290 Broadway, 18th Floor, New York, New York.

The public comment period for the OU1 Proposed Plan began on July 27, 2005, when EPA published a notice in the Express Times newspaper containing information concerning the public comment period for the Site, including the duration of the comment period, the date of the public meeting and availability of the administrative record. A public meeting was held on August 4, 2005, at the Warren County Vocational Technical School located on Route 57, Franklin Township, Warren County, New Jersey. The purpose of this meeting was to inform local officials and interested citizens about the Superfund process, to discuss the Proposed Plan and receive comments on the Proposed Plan, and to respond to questions from area residents and other interested parties.

The public comment period was initially scheduled to end on August 26, 2005. In response to a request received during the August 4th public meeting, EPA extended the comment period to September 26, 2005. EPA notified the public of the extension of the public comment period through an additional public notice in the Express Times on August 23, 2005.

SCOPE AND ROLE OF THIS OPERABLE UNIT

For the purposes of planning response actions, EPA will address the Site in separate remedial phases referred to as operable units (OUs). This OU1 ROD addresses TCE and PCE contaminated groundwater within Washington Borough, and parts of Washington and Franklin Townships. TCE and PCE are the specific contaminants of concern (COCs) for the Site. A ROD addressing the contaminated soils source areas will be finalized after a supplemental soil investigation has been completed. The RI/FS for OU2 will determine the nature and extent of contaminated groundwater in the OU2 Study Area located downgradient of the OU1 Area, identify the sources of contamination, and determine

whether contamination is connected to the OU1 portion of the Site.

Because guidance for evaluating the potential for vapor intrusion into buildings was not available during the implementation of the OU1 RI, EPA will evaluate the potential inhalation risk for the vapor intrusion pathway for OU1 areas in a subsequent phase of work.

SUMMARY OF SITE CHARACTERISTICS

The Site encompasses a broad range of demographics. The northern portion of the OU1 Area is within the commercial, industrial and residential portion of Washington Borough, Warren County, NJ. The southern part of the OU1 Area is generally rural, with scattered residences and housing developments located within both Washington and a portion of Franklin Townships, Warren County, NJ. The valley is surrounded by heavily wooded areas and two parallel opposing topographic ridges. The Site lies within the elongated valley between the ridges. The geology of the Pohatcong Valley consists of unconsolidated sedimentary deposits of glacial origin overlaying weathered bedrock. The unconsolidated sediments vary in thickness, but are generally between 50 and 100 feet thick within the OU1 Area, with the deeper portion in the Washington Borough area. Underlying the unconsolidated sediments is the primary drinking water aquifer for the Site, which is generally composed of competent bedrock, consisting of fractured and karstic limestone and dolomite.

Groundwater in the Pohatcong Valley is found to a limited extent in perched aquifers within the shallow unconsolidated deposits, and primarily in the deeper regional aquifer in the weathered overburden and bedrock. Perched aquifers are not considered to represent a significant source of groundwater for the region.

Groundwater in the regional aquifer is generally encountered at a depth of approximately 100 feet below ground surface (bgs) in the northern part of the OU1 Area, and at a depth of approximately 40 feet bgs in the downgradient, southernmost portion of the OU1 Area. Groundwater in the regional aquifer generally flows to the southwest, along the length of the Pohatcong Valley. Pohatcong Creek runs approximately through the central axis of the Valley (see Appendix I, Figure 1).

The groundwater in Pohatcong Valley is used as a source of potable drinking water, for industrial cooling and process water, and for irrigation purposes. New Jersey American Water Company (NJAWC) owns and operates the Dale Avenue and Vannatta Street public supply wells in which TCE and PCE were originally

detected. Under state law, groundwater extracted from these wells is treated to meet all NJ drinking water standards. About 65 and 124 million gallons of water are produced annually by the Dale and Vannatta wells, respectively. In 2002, EPA sampling of the Vanatta Street well indicated PCE of 54 ppb, and TCE of 1 ppb. In 2001, EPA sampling of the Dale Avenue well indicated PCE of 0.9 ppb, and TCE of 130 ppb.

OU1 RI fieldwork activities were conducted from June 1999 through September 2003, in three phases, identified as 1A, 1B, and 2. The RI Phase 1A field work involved PSA site visits, utility clearances, and soil gas surveys. The soil gas survey results were used in the selection process for PSAs to be retained for further evaluation during Phase 1B. The results of Phase 1B were used to evaluate which PSAs should be retained for further Phase 2 field work. Phases 1B and 2 included the following work activities at the selected PSAs: surface geophysics; soil boring advancement; surface and subsurface soil sampling; surface water and sediment sampling; temporary well point installation and sampling; permanent monitoring well installation and sampling; borehole geophysics; and bedrock packer testing. During each phase of field work, the PSA's were narrowed to identify soil source areas.

A total of 45 PSAs underwent RI field work. Field work consisted of the following activities: 45 groundwater monitoring wells were installed; 59 temporary wells were installed; 35 domestic wells were sampled; 286 groundwater samples were collected; 152 soil borings were completed; 399 soil samples were collected; 21 sediment samples were collected; 43 surface water samples were collected; 93 soil gas samples were collected; over four miles of seismic survey and 2 miles of borehole geophysics were conducted; 320,000 gallons of waste water were treated on-site; and 550 drums of investigation derived wastes were disposed of off-site.

Soils

A soils RI was begun in the OU1 Study Area, to identify soil source areas of groundwater contamination, and determine the nature and extent of the soil contamination. During the RI, elevated levels of TCE were detected in soils at two PSAs. A full delineation of these source areas will be performed as part of a supplemental soils investigation that will be completed in the near future. As discussed, a remedy that addresses soils contamination will be selected in a subsequent ROD. To characterize the surface soils contamination at the Site, the work performed to date includes the following: 95 surface soil samples (i.e., 0 to 2 feet below ground surface), and 304

subsurface soil samples were collected (i.e., deeper than 2 feet below ground surface (bgs)). In addition, a total of 93 soil gas samples were collected for screening purposes.

Volatile Organic Compounds (VOCs)

Based on the soil data collected, TCE was found in soils at concentrations above the New Jersey Impact to Ground Water Soil Cleanup Criteria (IGWSCC) of 1 ppm at two of the 45 PSA facilities investigated, ANC and Area of Concern 1 (AC1) (see Appendix I, Figure 2). ANC is a former American National Can facility, purchased by Pechiney Plastic Packaging, Inc. in 1999, and currently owned by Alcan Packaging. The ANC property was originally developed as a manufacturing facility in the 1950s on open farmland. It is currently an operating facility manufacturing various plastics packaging products for numerous vendors. AC1 is located immediately adjacent to the south of ANC, containing a large unfinished warehouse structure. Prior to the 1980s, the AC1 property was a combination of undeveloped land and residential property. Presently, AC1 consists of a large unfinished warehouse structure, and has recently been proposed for sale and possible redevelopment as residential units.

The RI findings indicate that TCE is the most prevalent contaminant found in soils at both ANC and AC1. Surface and subsurface soil sample analytical results at the ANC facility indicate the presence of TCE in the majority of the soil samples collected from the surface to a depth of greater than 80 feet. In contrast, TCE soils contamination at AC1 was found to be limited to depths shallower than 10 feet.

At ANC, the highest concentrations of TCE detected in soil were found at two general locations, referred to as areas "ANC A" and "ANC B". At AC1, TCE was confined to a limited portion of the property immediately adjacent to and downslope of the ANC facility, within the southernmost part of the ANC A cleanup area which extends into a larger part of the ANC property (see Appendix I, Figure 2).

Surface soil sampling revealed TCE contamination at a maximum concentration of 3 ppm at the ANC facility, and 3.1 ppm at AC1. Subsurface soil sampling at AC1 revealed TCE contamination at a maximum concentration of 52 ppm at eight feet bgs, at a location immediately downslope of the ANC property, and a maximum concentration of 13 ppm at a depth of three feet at ANC.

As part of the RI, a limited investigation of a southern part of the ANC facility's external drainage system was conducted upgradient of the AC1 area to determine the level of contamination that might be in the ANC drainage system, and to determine the potential for the system to be a source and/or facilitate the transport of contamination. There are numerous drain pipes at ANC which operate through open discharge to the ground surface and through overland runoff from the facility drainage system. The two samples collected from the effluent of one of these discharge pipes had concentrations of TCE at 10 ppb, and 20 ppb.

It should be noted that a greater amount of TCE contamination has been detected in groundwater than could be accounted for entirely from the ANC A and ANC B soil source areas identified during the RI. Therefore, additional contamination is believed to occur on and in soils in the vicinity of the ANC property. Previous studies and remediation activities conducted by ANC under oversight of the NJDEP have detected TCE concentrations of up to 400 ppm in shallow soils at the ANC facility. After issuance of the Proposed Plan for the OU1 Area, NJDEP required the current site owner of ANC to conduct investigations underneath the facility. The preliminary results from this sampling effort indicates that TCE contamination above IGWSCC exists in both shallow and deep soils in the area EPA refers to as ANC C in the FS and herein. A supplemental soil investigation will be conducted in the vicinity of ANC and AC1, to refine the extent of the soil contamination.

The highest concentrations of PCE in soil were detected at the following three facilities: L&L Dry Cleaners (LNL), Modern Valet Service (MVS), and Tung Sol Tubing/Pohatcong Hosiery (TVN) facilities. Although PCE was detected at these locations in shallow soils, all soil concentrations were lower than the IGWSCC of 1 ppm, and therefore will not require remedial action. The total mass of PCE in soil at each of the three PSAs is approximately 0.5 pound. Based on these results, soils are no longer a significant source of PCE groundwater contamination.

Semi-Volatile Organic Compounds (SVOCs) and Inorganic Compounds

Although the primary objective of EPA's OU1 RI focused on the targeted compounds of TCE and PCE, and the source areas of this contamination; the samples that were collected as part of the RI were also analyzed for SVOCs and metals. Slightly elevated concentrations of semi-volatile organic compounds and metals were detected in soils at several of the investigated PSA facilities.

However, these compounds are not Site related COCs, have not historically impacted the public water supply wells and do not currently appear to be impacting groundwater. EPA will monitor these contaminants as part of the groundwater remedy implementation. For each PSA facility demonstrating an unacceptable risk, EPA will provide a summary of the risk assessment and results of the RI to each facility property owner, as well as to the State of New Jersey and local authorities for appropriate action. This information has also been made available to the State of New Jersey. The full list of contaminants that were detected during the OU1 RI and their associated risks is presented in the Final OU1 Remedial Investigation Report document, and in the Site Administrative Record. A remedy addressing contaminated soils source areas for TCE will be issued after the supplemental soils investigation has been completed.

Groundwater Contamination

Groundwater flow at the Site is to the southwest (see Appendix I, Figure 3). TCE is by far the main groundwater contaminant within the Pohatcong Valley OU1 Area. PCE is also present, though, at lower concentrations and covering a smaller aerial extent. Groundwater samples collected throughout the OU1 Study Area indicate that TCE and PCE have migrated down through unconsolidated soils from the source areas located in the Washington Borough area, into the regional aquifer, contributing to two separate plumes. The extent of the PCE plume is much smaller than the TCE plume, and it is localized within Washington Borough. The TCE plume has migrated in the regional aquifer several miles downgradient from its sources, whereas, the PCE plume has remained primarily within Washington Borough, and is approximately one and a half miles in extent (see Appendix I, Figures 4 and 5). The TCE plume is several miles in extent and is located in the center of the Pohatcong Valley. As stated above, the OU1 groundwater investigation included 45 wells, 59 temporary wells, 35 domestic well samples, and 286 groundwater samples.

The highest PCE concentration detected in groundwater monitoring wells during the RI was 54 ppb at the Vannatta Street public supply well, near the L&L Econowash Cleaners (LNL) and Modern Valet Service (MVS) facilities. The highest PCE detected in groundwater was found in one grab sample taken at the regional water table from a boring installed adjacent to L&L Dry Cleaners, which revealed PCE at a concentration of 1,500 ppb.

The highest TCE concentration detected in groundwater sampled during the RI, 2,100 ppb, was located at the former Vikon Tile Corporation (VTC) property, which is located immediately downgradient of the present ANC facility (see Appendix I, Figure 2, for the locations of these facilities). During the RI, two new groundwater monitoring wells were installed at the ANC facility, and four temporary well points were constructed, supplementing the existing monitoring wells that were in place from previous investigations conducted under NJDEP oversight. At ANC, wells and well points were constructed at depths ranging from 30 feet below ground surface (bgs), within a perched zone, to about 412 feet bgs, in the regional aquifer in the bedrock unit located beneath ANC. Sampling results in the regional aquifer revealed that groundwater underlying the ANC facility is consistently highly contaminated with TCE, at concentrations as high as 680 ppb. In the same area, sampling results at the AC1 facility revealed a concentration of TCE in groundwater of 12 ppb, indicating AC1 is located near the edge of the groundwater contaminant plume.

During the RI, water that was perched within the overburden soils, where encountered, was sampled during installation of the well points and groundwater monitoring wells to characterize potential source areas, to evaluate potential zones of contamination, and to identify potential contamination migration pathways. The ANC facility was the only facility where perched water contained detections for TCE, in samples from depths of 30 feet and 70 feet, at concentrations of 120 ppb and 170 ppb, respectively.

It should be noted that the horizontal and vertical extent of groundwater contamination in the regional aquifer has not been completely determined because the contaminants of concern were detected in the deepest monitoring well installed during the RI, at 412 feet bgs in PVANC02, and in the most downgradient OU1 monitoring well; therefore, the depth of contamination in the OU1 Area will be investigated as part of the OU1 Remedial Design phase, and a second operable unit has been established to define the nature and extent of TCE contamination in the OU2 Study Area, located downgradient of OU1. All of the existing monitoring wells have been installed within the OU1 boundary, and most of these wells indicate a plume of TCE and PCE contamination moving slowly away from the source areas within Washington Borough, to the southwest. Additional groundwater monitoring wells will be installed within the OU2 Study Area to adequately characterize flow conditions and the extent of contamination.

While the RI focused on the targeted compounds of TCE and PCE, slightly-elevated concentrations of two SVOCs were detected in two groundwater samples collected at ANC, benzo(a)pyrene and bis(2-ethylhexyl)phthalate (DEHP), at maximum concentrations of 2 ppb and 61 ppb, respectively. These concentrations exceed the applicable NJGWQS.

Sediment and Surface Water

To investigate whether sediments are impacted with chlorinated VOCs, and whether regional groundwater is impacted with chlorinated VOCs, EPA collected 21 sediment samples and 43 surface water samples in Shabbacong and Pohatcong Creeks, including 15 surface water samples collected in the former Edison Quarry.

Nine sediment samples collected from Pohatcong and Shabbacong Creeks, in both the OU1 Study Area and up to three miles southwest, beyond the OU1 Study Area, contained TCE and PCE at estimated concentrations ranging from 1 part per billion (ppb) to 26 ppb, with TCE being the most prevalent contaminant detected. The detected concentrations were below ecological screening level values. Edison Quarry surface water, located within the OU2 Study Area, was sampled and chlorinated VOCs were detected in a majority of samples at concentrations ranging from 0.36 ppb to 6.3 ppb. TCE was detected up to 87 feet deep in the Edison Quarry. This area will be further addressed during the OU2 RI/FS.

Cultural Resources Assessment

In March 2000 and several times in 2001, in accordance with 36 C.F.R 800: Protection of Historic Properties, the New Jersey Historic Preservation Office was consulted, and it was determined that the Morris Canal Historic District lies adjacent to the ANC and AC1 facilities, and in the vicinity of several other facilities that were investigated as part of the OU1 RI. The Morris Canal was listed in the National Register of Historic Places, on October 1, 1974. The trace of the Morris Canal was identified based on this consultation and through a review of local tax maps.

The Assessment of Adverse Effects concluded that the planned RI activities near the Morris Canal, including well installations and borings, would not have an adverse effect. However, in the event locations are identified for future remedial activities, consultation under Section 106 of the National Historic Preservation Act was recommended early in the remedial process.

The RI concluded that the Site poses a potential threat of off-site contaminant migration via run-off to a small portion of wetland area within the Former Morris Canal area. Thus, this remedy will address the need for measures to manage/prevent the off-site migration of contaminants to the Former Morris Canal.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Site Uses:
Groundwater within OU1 Area is classified by NJDEP as a Class IIA resource, it is a current source of drinking water, and it is expected to remain a source of drinking water in the future. Two potable public supply water wells for the NJAWC are located within OU1 Area boundary, the Dale Avenue and Vanatta Street wells. Without the use of air strippers, this resource would be rendered unusable for potable purposes due to the presence of TCE and PCE contamination.

SUMMARY OF SITE RISKS

Based upon the results of the OU1 RI, a baseline human health risk assessment (BHHRA) and an ecological risk screening were conducted to estimate the risks associated with current and future OU1 Area conditions. A risk assessment is an analysis of the potential adverse effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases under current and anticipated future land use. It should be noted that the portion of the BHHRA related to soils will be updated based on the new data collected during the upcoming supplemental soils investigation.

The risk assessment document for OU1, entitled Human Health Risk Assessment - Pohatcong Valley Groundwater Contamination Site Operable Unit 1, USEPA June 2005, is available in the Site Administrative Record file.

Human Health Risk Assessment

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

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

bioaccumulation.

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

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

Toxicity data for the human health risk assessment were obtained from EPA's Integrated Risk Information System (IRIS), EPA's consensus database for toxicity information. In the absence of an IRIS value, toxicity information was obtained from the EPA's Health Effects Assessment Summary Tables (HEAST) with updates by EPA's National Center for Environmental Assessment, as appropriate. Chemicals lacking toxicity values were evaluated qualitatively.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of Site hazards and risks. Exposures are evaluated based on the potential for noncancer health hazards and the potential risk of developing cancer. The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a chronic time period of seven years or more, with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious health effects. The ratio of the exposure dose to the reference dose is called a Hazard Quotient (HQ). An HQ of less than or equal to 1 indicates that the exposure dose is less than or equal to the RfD, and that noncarcinogenic health effects are unlikely to occur. The Hazard

Index for an exposure pathway is generated by summing the HQs for all chemicals of concern for a singular pathway and across pathways of exposure. An HI of less than or equal to 1 indicates that noncarcinogenic health effects are unlikely to occur. A Hazard Index of greater than 1 indicates the likelihood that site-related exposures may result in noncarcinogenic health effects. The HQ is calculated as follows:

$$HQ = CDI/RfD$$

where: HQ = hazard quotient
CDI = chronic daily intake (mg/kg-day)
RfD = reference dose (mg/kg-day)

For cancer, the likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; i.e. one additional cancer may be seen in a population of 10,000 people as a result of exposure to Site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk) with 10^{-6} being the point of departure. Excess lifetime cancer risk is calculated from the following equation:

$$Risk = CDI \times CSF$$

where: Risk = a unitless probability (e.g., 1×10^{-4} or one in 10,000) of an individual's developing cancer
CDI = Chronic Daily Intake averaged over 70 years (mg/kg-day)
CSF = Cancer Slope Factor, expressed as $(mg/kg\text{-}day)^{-1}$

Evaluation: The human-health estimates summarized here are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative estimates about the frequency and duration of an individual's exposure to the COCs in the various media that would be representative of Site risks, as well as the toxicity of these contaminants.

Screening-level risk was evaluated for 45 Potential Source Areas (PSAs), and for 80 groundwater monitoring and water supply wells investigated during the OU1 RI. Based on the screening-level risk evaluations, EPA selected 8 PSAs, 3 wells, and the TCE and PCE groundwater plumes to undergo a full baseline human health risk assessment (HHRA). Consistent with EPA policy, the HHRA evaluated the potential human health risks associated with

exposure to the chlorinated VOCs, as well as other constituents such as metals, semi-volatile organic compounds (SVOCs), and non-chlorinated VOCs detected during the RI.

The primary contaminants of concern (COCs) in the groundwater are TCE and PCE. Other contaminants were detected and were included in the risk assessment. **Table 1** summarizes the groundwater COCs and provides the medium-specific exposure point concentrations.

Since groundwater in the regional aquifer within the OU1 Study Area is used as a potable water supply, the risk assessment evaluated the risks associated with exposures to the groundwater in the OU1 Study Area for industrial/commercial and residential use. **Table 2** summarizes exposure pathways that are associated with OU1.

The results of the baseline risk assessment indicate that the contaminated groundwater within OU1 poses an unacceptable risk to human health. **Table 3** presents a summary of the non-cancer toxicity data used to calculate the non-carcinogenic hazards and **Table 4** presents a summary of the cancer toxicity data used to calculate the carcinogenic risk.

The hazards and risks associated with exposure to the regional aquifer groundwater within the OU1 Study Area result in risks above EPA's target risk levels for both industrial and residential scenarios. **Table 5** presents a summary of the hazard characterization for non-carcinogenic effects and **Table 6** presents a summary of the risk characterization for carcinogenic effects.

Although other contaminants were detected in groundwater and contribute to risk, TCE and PCE by far present the most concern for the Site. In contrast to the TCE and PCE groundwater contamination, other contaminants identified are limited in extent, and are localized inside and outside the TCE and PCE plumes, and a number of metals may be associated with background conditions. It should be noted that the OU1 Study Area is approximately 8.75 square miles (5,600 acres), and the aerial extent of the TCE and PCE plumes extends approximately 5 miles in length.

For the aforementioned reasons, these other groundwater contaminants within the OU1 TCE and PCE plumes will be addressed in this remedy by long-term monitoring of natural attenuation.

The evaluation of the potential inhalation risk for the vapor intrusion pathway for the OU1 Area will be included as part of the OU2 RI/FS activities.

The attached Tables present the findings of risk for soils as well as groundwater. Based on the RI, TCE is the primary COC in both surface and subsurface soil. A summary of soils risks is not presented in this ROD because a supplemental TCE soils investigation will be performed to further define and delineate the extent of the TCE soil contamination in the source areas. However, based on the OU1 RI results, for PSA facilities where there was a demonstrable unacceptable risk level, EPA will provide a summary of the risk assessment and results of the RI to each facility property owner, as well as to the State of New Jersey and local authorities for appropriate action. Upon completion of the supplemental soils investigation in the TCE source areas, a risk assessment will be performed and a soil remedy will be selected and documented in a ROD.

Uncertainty Assessment

Uncertainties are inherent in risk assessment estimates due to the assumptions and parameter values that are chosen. It is important to place the risk estimate in proper perspective, because the risk measure may be based upon either a specific set of assumptions about exposure and toxicity or a range of exposure and toxicity values. For this assessment, the risk measure is based upon a specific set of assumptions about exposure and toxicity. The uncertainties associated with the risk measure was discussed in detail in the Human Health Risk Assessment. In general, the main sources of uncertainty include the selection of chemicals of concern, exposure assessment, toxicological data, and risk characterization.

Ecological Risk Assessment

EPA conducted a screening of ecological risks and concluded that the conditions at the Site do not necessitate a quantitative ecological risk assessment. The qualitative evaluation is summarized below.

An ecological risk assessment was completed using the laboratory analytical data to evaluate the ecological impacts associated with the contaminants detected in the surface water, sediment, and surficial soil in the OU1 Study Area. The ecological risk

assessment concluded that 1) a completed exposure pathway exists at the Site for terrestrial plants/soil invertebrates, benthic macro-invertebrates, and aquatic life; and 2) the areas of impact are localized such that there is a limited overall potential for chlorinated volatile organic compounds to adversely affect the terrestrial plants/soil invertebrate, benthic macro-invertebrate, and aquatic life communities. The wetlands in the Pohatcong Valley are not presently impacted by Site contamination, and are not anticipated to be impacted during remediation.

Basis for Action

Based upon the quantitative human-health risk assessment and the qualitative ecological evaluation, EPA has determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the response action selected in this ROD, may present a current or potential threat to human health and the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs) and risk-based levels established in the risk assessment.

The following remedial action objectives for groundwater contaminated with TCE and PCE will address the human health risks and environmental concerns:

- Restore the groundwater aquifer to drinking water quality; and

- Prevent human ingestion of contaminated groundwater.

In considering how best to achieve these RAOs, EPA is utilizing the NJGWQS of 1 ppb for TCE and PCE.

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA requires that each remedial alternative be protective of human health and the environment, be cost effective, comply with

ARARs, and utilize permanent solutions and alternative treatment technologies and resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility or volume of hazardous substances.

CERCLA requires that if a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at a site above levels that allow for unlimited use and unrestricted exposure, EPA must review the action no less often than every five years after initiation of the action. Consistent with expectations set out in the NCP, none of the remedial alternatives evaluated rely exclusively on institutional controls to achieve protectiveness. The time frames for construction, as indicated below, do not include the time needed to perform Remedial Design activities, nor the time to procure contracts.

Common Elements

Groundwater Alternatives GW2 through GW4 require groundwater extraction, treatment, and discharge of the treated effluent via reinjection back to the regional aquifer as common elements. Since Groundwater Alternatives GW2 and GW3 do not consider pumping and treatment of the entire OU1 plume, another common element for groundwater is natural attenuation. Natural attenuation is expected to be effective in the lesser contaminated downgradient portion of the aquifer based on the large capacity and other physical characteristics of the aquifer.

A Well Restriction Area is already in place for groundwater. However, the Well Restriction Area does not cover the entire extent of the OU1 groundwater contaminant plume in the upgradient area. Institutional controls, such as the implementation of a Classification Exemption Area, are needed as a common element for all alternatives to ensure the restriction of the use of groundwater within the entire OU1 area until the aquifer is restored.

For the three active groundwater pump and treatment alternatives, GW2, GW3 and GW4, if, during implementation, residences or businesses within the aerial extent of the OU1 plume are found to have not yet been connected to public water, EPA would consider connecting them, and sealing their wells as another common element. Each of these alternatives includes groundwater reinjection. This technology is expected to be effective based on the overall characteristics of the regional aquifer.

REMEDIAL ALTERNATIVES

The remedial alternatives for contaminated groundwater within the OU1 Study Area are summarized below. Four remedial alternatives were developed for groundwater. The alternatives will address the extent of contamination above the cleanup criteria of 1 ppb for TCE and PCE in groundwater. These alternatives were selected from the alternatives that were evaluated in detail in the Feasibility Study for this Site. It should be noted that the soils source areas will undergo further delineation during a supplemental investigation to more accurately determine the extent of contaminated material, and to define specific locations that need to be remediated in a subsequent soils ROD.

GROUNDWATER ALTERNATIVES

Groundwater Alternative GW1: No Action

Estimated Capital Cost: $0

Estimated Annual O&M Cost: $0

Estimated Present Worth Cost: $0

Estimated Construction Time frame: None

Estimated Time of Environmental Restoration: greater than 60 years

Regulations governing the Superfund program generally require that the No Action alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action to address contaminated groundwater within the OU1 Area. Review of the remedy every five years would be required. Costs for five year reviews are not included in the present worth evaluation.

Groundwater Alternative GW2: Source Treatment and Natural Attenuation

Estimated Capital Cost: $2,552,000

Estimated Annual O&M Cost: $606,000

Estimated Present Worth Cost: $8,060,000

Estimated Construction Time frame: 1 Year

Estimated Time of Environmental Restoration: 55 years

The objective of Groundwater Alternative GW2 is to extract and treat the most contaminated part of the TCE plume in the OU1 Area (concentrations that exceed 500 ppb) using a series of extraction wells along the downgradient edge of this source area. The TCE treatment system would consist of three high yield extraction wells, each pumping at approximately 140 gallons per minute (gpm). The PCE system would consist of one extraction well, placed within the PCE contaminant plume, pumping at approximately 100 gpm. Total generated groundwater for both systems would be approximately 520 gpm, for a total of approximately 749,000 gallons per day (gpd). Extracted groundwater would be treated using air stripping (transferring TCE and PCE from liquid to vapor phase, with off-gas treatment) prior to reinjection of the treated water into the regional aquifer. Long-term monitoring of natural attenuation for target compound list VOCs and SVOCs, and target analyte list metals, in the downgradient portions of the OU1 TCE and PCE plumes to determine whether these contaminants are meeting drinking water standards.

This alternative will actively reduce the concentrations of TCE and PCE in groundwater in the portion of the OU1 Area having the highest contamination. In addition, natural attenuation is expected to be effective in the lessor contaminated downgradient portion of the aquifer based on the large capacity and other physical characteristics of the aquifer. A Well Restriction Area is already in place for groundwater. However, the Well Restriction Area does not cover the entire extent of the OU1 groundwater contaminant plume. Institutional controls, such as the implementation of a Classification Exemption Area, are needed to assure that groundwater use is restricted within the entire area of the OU1 groundwater plume until the aquifer is restored. While it is believed that most businesses and residences are connected to public water, if, during implementation, residences or businesses within the aerial extent of the OU1 plume are found to have not yet been connected to public water, EPA would consider connecting them, and sealing their wells.

Groundwater Alternative GW3: Expanded Source Treatment and Natural Attenuation

Estimated Capital Cost: $3,399,000

Estimated Annual O&M Cost: $996,000

Estimated Present Worth Cost: $25,760,000

Estimated Construction Time frame: 1.5 Years

Estimated Time of Environmental Restoration: 47 years

This alternative is similar to and modifies the Groundwater Alternative GW2 by installing additional extraction wells and increasing the pumping rate to capture a larger area of groundwater that exceeds 100 ppb of TCE within the OU1 Area. The TCE treatment system would include five high yield extraction wells, each pumping at approximately 280 gpm. The PCE system would consist of two extraction wells placed within the PCE source areas, each pumping at approximately 210 gpm. Total generated groundwater for both systems would be approximately 1,610 gpm, for a total of approximately 2,318,400 gallons per day. Extracted water would be treated in the same manner as Groundwater Alternative GW2 via air stripping, prior to reinjection into the regional aquifer. Long-term monitoring of natural attenuation for target compund list VOCs and SVOCs, and target analyte list metals, in the downgradient portions of the OU1 TCE and PCE plumes to determine whether these contaminants are meeting drinking water standards.

This alternative meets the remedial objectives by extracting and treating the areas of groundwater contamination containing the highest concentrations of TCE and PCE within the OU1 Area. This alternative will actively reduce the concentrations of TCE and PCE in groundwater in the OU1 Area having the highest contamination. In addition, natural attenuation is expected to be effective in the lessor contaminated downgradient portion of the aquifer based on the large capacity and other physical characteristics of the aquifer. A Well Restriction Area is already in place for groundwater. However, the Well Restriction Area does not cover the entire extent of the OU1 groundwater contaminant plume. Institutional controls, such as the implementation of a Classification Exemption Area, are needed to restrict the use of groundwater within the entire area of the OU1 plume until the aquifer is restored. If, during implementation, residences or businesses within the aerial extent of the OU1 plume are found to have not yet been connected to public water, EPA would consider connecting them, and sealing their wells.

Groundwater Alternative GW4: Entire Plume Capture and Treatment

Estimated Capital Cost: $10,811,000

Estimated Annual O&M Cost: $2,373,000

Estimated Present Worth Cost: $46,840,000

Estimated Construction Time frame: 3 Years

Estimated Time of Environmental Restoration: 22 years

Groundwater Alternative GW4 meets the groundwater cleanup standards through the capture and treatment of the entire groundwater plume that exceeds a concentration of 1 ppb of TCE and 1 ppb of PCE, within the OU1 Area. This alternative protects human health and the environment within the OU1 Area and downgradient of the plume by removing the greatest amount of contaminated groundwater from the regional aquifer, since this alternative includes entire plume capture and treatment. It would require six sets of five extraction wells (30 wells total) oriented perpendicular to the migration of the plume, with each set spaced approximately 4,000 feet along the longitudinal extent of the OU1 TCE and PCE plumes. To completely capture the plume, an estimated minimum of 1,500 gpm would need to be pumped at each set of extraction wells. This extraction system would produce a total of 9,000 gpm, for nearly 13 million gallons per day. The groundwater treatment system is assumed to be similar in process to that presented for Groundwater Alternatives GW2 and GW3, although significantly larger in scale to allow for treatment of higher volumes of groundwater (e.g., approximately six treatment plants may be needed to treat the amount of water extracted under this alternative). Under this alternative, groundwater remediation goals would be met in approximately 22 years.

This alternative meets the remedial objectives by extracting and treating the largest area of groundwater contamination in the OU1 Area. This alternative would actively reduce the concentrations of TCE and PCE in groundwater in the OU1 Area having the highest contamination. Similar to Alternatives GW1, GW2, and GW3, a Well Restriction Area is already in place for groundwater. However, the Well Restriction Area does not cover the entire extent of the OU1 groundwater contaminant plume. Institutional controls, such as the implementation of a Classification Exemption Area, are needed to restrict the use of groundwater within the entire area of the OU1 groundwater plume until the aquifer is restored. If, during implementation, residences or businesses within the aerial extent of the OU1 plume are found to have not yet been connected to public water, EPA would consider connecting them, and sealing their wells.

EVALUATION OF ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select the preferred remedial alternative. This section of the ROD profiles the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration. The nine evaluation criteria are described in the text box. (Appendix I, Figure 6) The Detailed Analysis of Alternatives can be found in the FS report.

1. Overall Protection of Human Health and the Environment

The No Action Groundwater Alternative GW1 is not considered protective of human health and the environment because it does not reduce contamination, or include groundwater monitoring to determine the fate and transport of the groundwater contaminant plume over time. Future exposure to groundwater could result in unacceptable and uncontrolled risks to the public.

The remaining alternatives are considered protective. Groundwater Alternatives GW2 and GW3 include long-term monitoring of natural attenuation for the downgradient portion of the plumes. Each alternative progressively treats more groundwater contamination, with GW4 expected to treat the highest volume of groundwater.

2. Compliance with ARARs

Major applicable ARARs for the OU1 Area are listed below.

Chemical Specific ARARs: Federal MCLs (40 CFR 141)- Groundwater NJDEP GWQS (N.J.A.C. 7:9-6).

Action Specific ARARs: Federal Safe Drinking Water Act (40 CFR 144); Underground injection permitting NJDEP GWQS (N.J.A.C. 7:9-6) - Treatment standards for re-injection of groundwater; National Contingency Plan (CERCLA) - (40 CFR 300, Subpart E) - General Remediation.

Location Specific ARARs: National Historic Preservation Act (16 U.S.C. 470) - Preserving historic places (Morris Canal); Wetlands Act of 1970 (N.J.S.A. 13:9A-1 et.seq.) - Protection of wetlands.

A full list of ARARs, including relevant NJDEP Technical Regulations (N.J.A.C. 7:26E) - General Remediation in New Jersey, is included in Table 9, of this ROD.

With the exception of the No Action Groundwater Alternative, GW1, each groundwater alternative satisfies the ARARs.

All alternatives that involve active groundwater treatment, GW2, GW3, and GW4, would restore the aquifer to drinking water cleanup standards in less time than Alternative GW1. Air treatment for emissions from the treatment plants to meet Clean Air Act and applicable NJDEP ARARs may be required for GW2, GW3, and GW4.

3. Long-term Effectiveness and Permanence

The long-term effectiveness and permanence of the extraction and ex-situ treatment Groundwater Alternatives GW2, GW3 and GW4, are better than Alternative GW1, because these involve the active reduction of TCE and PCE concentrations in groundwater through treatment near the highest areas of contamination. The remaining alternative, GW1, the No Action Groundwater Alternative, is not considered to be effective in the long term.

The groundwater collection and treatment alternatives, GW2, GW3 and GW4, are similar in their long-term effectiveness and permanence due to the relatively high rates of pumping and treatment of groundwater. Groundwater Alternative GW4 ranks higher in long-term effectiveness and permanence because a larger mass of TCE and PCE in groundwater would be actively removed. Groundwater Alternative GW2 would take longer than GW3 to achieve remediation goals, while Groundwater Alternative GW4 would take the shortest amount of time.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Groundwater Alternatives GW2, GW3, and GW4 each reduce contaminant mass by removing TCE and PCE from impacted groundwater prior to reinjecting it into the aquifer.

Groundwater Alternative GW4 is the most effective alternative because it removes TCE and PCE from the groundwater throughout the entire contaminant plume. Groundwater Alternatives GW2 and GW3 also remove TCE and PCE within the targeted cleanup areas to below the cleanup criteria. The targeted TCE and PCE cleanup areas for Alternative GW2 are smaller than for either Alternative GW3 or GW4, but addresses more concentrated contamination than would be treated by these other alternatives. Groundwater Alternative GW1 does not reduce contaminant mass through treatment.

5. Short-term Effectiveness

The No Action Groundwater Alternative, GW1, has no short-term impacts because it involves no remedial action.

Groundwater Alternative GW4 is considered to have the greatest negative short-term impact, because the large volumes of water extracted may promote dewatering within the Valley, which could lessen recharge to streams, and damage natural resources such as the tributaries and wetlands along Pohatcong Creek. The implementability of this alternative is also considered to be

poor because of the number of extraction wells required (approximately 30) and the number of large treatment systems that would require multiple operators on a daily basis, as well as numerous lengthy piping runs to extraction, treatment and reinjection systems that may be disruptive within portions of Washington Township.

Groundwater Alternatives GW2 and GW3 would have significantly less short term impacts than GW4 with respect to the environment, the protection of workers during remedial construction, and the disruption of the community during remedial action.

The time until RAOs are achieved are shorter for the groundwater collection and treatment alternatives, GW2, GW3 and GW4, compared to the No Action Alternative, GW1, because these alternatives would actively reduce the concentrations of contaminants in groundwater. Groundwater Alternatives GW2 and GW3 are similar in terms of time frames and short-term effectiveness related to time until RAOs are met, estimated at 55 and 47 years, respectively. The time to achieve RAOs is longest for Alternative GW1, which would take greater than an estimated 60 years, and shortest for GW4, estimated at 22 years.

6. Implementability

Groundwater Alternative GW2 is easier to implement when compared to both Groundwater Alternatives GW3 and GW4, due to the lesser volumes of water to be extracted and treated. The additional water would require more or larger treatment systems to be constructed in Washington Township, as well as more extensive operation and maintenance and greatly increased cost. Moreover, the estimated time frame for remediation is not significantly reduced between Groundwater Alternatives GW2 and GW3 (from 55 to 47 years); however, the volume of water to be treated is tripled.

Groundwater Alternative GW4 would require excessive disruption of local streets and infrastructure during implementation, and for future repairs and maintenance work that would be necessary during the long-term operation and maintenance of the system. The siting of the numerous required treatment plants would pose challenges for Groundwater Alternatives GW3 and GW4. The large quantities of extracted groundwater in Groundwater Alternative GW4 would also present technical difficulties in terms of handling and reinjection. Permitting at the state and local levels would likely be much more difficult when compared to Groundwater Alternatives GW2 and GW3, due to the larger volume of water being extracted and treated, and the greater potential for negative impacts on the aquifer, streams and surface water bodies. The additional volumes of water would require multiple

extraction and treatment systems throughout the Valley. With Groundwater Alternative GW4, there is also the potential to damage natural resources in the Valley, through dewatering local surface water bodies and streams. This would possibly also place limits on water use by the municipal supply wells, production wells, and local irrigation wells. Access requirements for the construction of the large number of extraction systems and the lengthy piping runs to these systems would be extensive throughout the Valley. The costs for implementing Groundwater Alternative GW4 are nearly six times higher than Groundwater Alternative GW2; however, the time of remediation is only cut in half.

Alternatives GW3 and GW4 are much more difficult to implement than Alternative GW2. The mass reduction of TCE and PCE in groundwater is estimated to be the same throughout the life of the remedial action.

7. Cost

The No Action Groundwater Alternative, GW1, has the lowest present worth cost of $0. The present worth cost for Alternative GW2, is much lower than for Alternatives GW3 and GW4. The present worth cost for Alternative GW2 is $8,060,000, and for Alternative GW3, $25,760,000. Alternative GW4 is the most expensive alternative at $46,840,000, significantly more than the other alternatives.

8. State/Support Agency Acceptance

The State of New Jersey concurs with the selected groundwater remedy, Alternative GW-2.

9. Community Acceptance

The Proposed Plan and supporting documentation for OU1 were released to the public for comment on July 27, 2005. On July 27, 2005, EPA published a notice in the Express Times newspaper containing information concerning the public comment period for the Site, including the duration of the comment period, the date of the public meeting and availability of the administrative record. The supporting documents were made available to the public at the Warren County Department of Health Offices, 315 West Washington Avenue, Washington Borough, New Jersey, 07882; as well as at the EPA Superfund Records Center, 290 Broadway, 18th Floor, New York, New York.

The public comment period was initially scheduled to end on August 26, 2005. In response to a request at the August 4th

public meeting, EPA extended the comment period to September 26, 2005. EPA placed an additional public notice in the Express Times on August 23, 2005 to notify the public of this extension.

The public was generally supportive of the Proposed Alternatives.

The Responsiveness Summary, Appendix V, addresses the comments received during the public comment period.

PRINCIPAL THREAT WASTE

EPA's findings to date indicate the presence of "principal threat" wastes at the former ANC facility and at AC1. Principal threat wastes are considered source materials, i.e., materials that include or contain hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur.

A remedy addressing principal threat wastes will be outlined in a subsequent ROD, after the supplemental soils investigation has been completed and evaluated.

SELECTED REMEDY

Based upon consideration of the results of the OU1 RI, the requirements of CERCLA, the detailed analysis of remedial alternatives, and public comments, EPA has determined that Groundwater Alternative GW2 is the appropriate remedy for contaminated groundwater at the Site. This remedy best satisfies the requirements of CERCLA Section 121 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR § 300.430(e)(9). This remedy includes the following components:

- Pumping the most contaminated part of the TCE and PCE groundwater plumes using a series of extraction wells near the downgradient edge of the suspected soils source areas. For TCE, this will be implemented at the approximate location of the 500 parts per billion (ppb) isoconcentration isopleth of TCE; and for PCE, the location of an extraction

well will be in the approximate center of the PCE groundwater plume.

- Treatment of extracted water to meet the New Jersey Groundwater Quality Standards (NJ GWQSs) of 1 ppb for TCE and 1 ppb for PCE using air stripping (transferring TCE and PCE from liquid to vapor phase) prior to reinjection into the regional aquifer; and

- Long-term monitoring of natural attenuation for target compound list VOCs and SVOCs, and target analyte list metals, in the downgradient portions of the OU1 TCE and PCE plumes to determine whether these contaminants are meeting the appropriate NJ GWQSs or MCLs, whichever is lower; and

- Institutional controls, such as the implementation of a Classification Exemption Area to further restrict the use of groundwater within the OU1 area until the aquifer is restored.

While it is believed that most businesses and residences are connected to public water, if, during implementation, residences or businesses within the aerial extent of the OU1 plume are found to have not yet been connected to public water, EPA would consider connecting them, and sealing their wells.

The estimated cost of Alternative GW2 is $ 8,060,000. A summary of the estimated remedy costs are included in Appendix II, **Tables 7, 8 and 9**.

STATUTORY DETERMINATIONS

As was previously noted, CERCLA Section 121(b)(1) mandates that a remedial action must be protective of human health and the environment, must be cost-effective, and must utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. CERCLA Section 121(b)(1) also establishes a preference for remedial actions that employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA Section 121(d) further specifies that a remedial action must satisfy ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4). For the reasons discussed below, EPA has determined that the Selected Remedy meets the requirements of CERCLA Section 121.

Protection of Human Health and the Environment

The Selected Remedy, Groundwater Alternative GW2, will adequately protect human health and the environment by removing and treating the most highly contaminated groundwater, while utilizing institutional controls on the remainder of the groundwater plume undergoing natural attenuation. This action will result in the reduction of exposure levels to acceptable risk levels within EPA's generally acceptable risk range of 10^{-4} to 10^{-6} for carcinogens and below a hazard index (HI) of 1 for noncarcinogens. Implementation of the Selected Remedy will not pose unacceptable short-term risks or adverse cross-media impacts.

Compliance with ARARs

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs", unless such ARARs are waived under CERCLA section 121(d)(4).

During and at the completion of the response action for the contaminated groundwater, the Selected Remedy will meet action-specific , chemical-specific , and location specific ARARs. A complete list of ARARs are presented in Table 9.

Cost-Effectiveness

The Selected Remedy is cost-effective and represents reasonable value for the money to be spent. Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The overall effectiveness of the Selected Remedy has been determined to be proportional to the costs, and the Selected Remedy therefore represents reasonable value for the money to be spent.

The estimated present worth cost of the Selected Groundwater Remedy is $8,060,000, which includes source area groundwater treatment and natural attenuation with institutional controls for

the remainder of the groundwater plume. When comparing the Selected Remedy to Groundwater Alternative GW3, which also includes source treatment of a larger area of the groundwater plume, present worth costs are tripled while only capturing a slightly larger aerial extent of the groundwater plume. When comparing the Selected Remedy to Groundwater Alternative GW4, present worth costs are nearly six times higher, due to the extensive network of treatment systems and infrastructure and the volume of groundwater requiring treatment and reinjection. The Selected Remedy represents reasonable value for the money to be spent.

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

EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner for groundwater within the OU1 Area at the Site. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the Selected Remedy provides the best balance of trade-offs among the alternatives with respect to the five primary balancing criteria.

The Selected Remedy for groundwater satisfies the criteria for long-term effectiveness and permanence by removing the highest concentrations of groundwater contamination for treatment and reinjection, and relying on the utilization of institutional controls to prevent exposure to the contaminated groundwater plume within the OU1 Area.

The Selected Remedy is implementable at the Site since it incorporates a proven series of remedial technologies to address groundwater contamination. In addition, natural attenuation is expected to be effective in the lessor contaminated downgradient portion of the aquifer based on the large capacity and other physical characteristics of the aquifer. When compared to groundwater alternatives that capture larger volumes of impacted groundwater (GW3 and GW4), the Selected Remedy is easier to implement since a significant but smaller quantity of water will be managed, treated, and reinjected. Also, extensive networks of piping to handle the large volume of water makes Groundwater Alternatives GW3 and GW4 harder to implement than the Selected Remedy, because of the large aerial extent of the groundwater plume throughout the Valley which makes capture and management of the entire plume difficult. There is also the potential for natural resource injury to occur when pumping large volumes of water from the aquifer throughout the Valley that makes GW3 and GW4 less feasible than the Selected Remedy.

Preference for Treatment as a Principal Element

By utilizing groundwater pump and treatment for impacted groundwater, the statutory preference for remedies that employ treatment as a principal element is satisfied.

Five-Year Review Requirements

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

DOCUMENTATION OF SIGNIFICANT CHANGES

All written and verbal comments submitted during the public comment period were reviewed and responded to by EPA in the Responsiveness Summary, Appendix V. Upon review of these comments, it was determined that a significant change to the remedy, as it was originally identified in the Proposed Plan, was necessary. The Proposed Plan described EPA's preferred remedies for addressing the remediation of TCE and PCE-contaminated groundwater, as well as TCE-contaminated soils at the Site. After considering all comments received, EPA has decided to conduct a supplemental soils investigation to further define the extent of the TCE source area instead of conducting additional soils investigation during the remedial design phase as originally contemplated in the Proposed Plan. Therefore, the Selected Remedy described in this document addresses the remediation of TCE and PCE-contaminated groundwater within the OUI Area. A remedy addressing contaminated soils will be issued after the supplemental soils investigation has been completed.

GLOSSARY

ARARs: Applicable or Relevant and Appropriate Requirements. These are Federal or State environmental rules and regulations that may pertain to the site or a particular alternative.

Carcinogenic Risk: Cancer risks are expressed as a number reflecting the increased chance that a person will develop cancer if exposed to chemicals or substances. For example, EPA's acceptable risk range for Superfund hazardous waste sites is 1 x 10-4 to 1 x 10-6, meaning there is 1 additional chance in 10,000 (1 x 10-4) to 1 additional chance in 1 million (1 x 10-6) that a person will develop cancer if exposed to a site contaminant that is not remediated.

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act. A Federal law, commonly referred to as the "Superfund" Program, passed in 1980 that provides for response actions at sites found to be contaminated with hazardous substances, pollutants or contaminants that endanger public health and safety or the environment.

COC: Chemicals of Concern.

COPC: Chemicals of Potential Concern.

ERA: Ecological Risk Assessment. An evaluation of the risk posed to the environment if remedial activities are not performed at the site.

FS: Feasibility Study. Analysis of the practicability of multiple remedial action options for the site.

Groundwater: Subsurface water that occurs in soils and geologic formations that are fully saturated.

HHRA: Human Health Risk Assessment. An evaluation of the risk posed to human health should remedial activities not be implemented.

HI: Hazard Index. A number indicative of noncarcinogenic health effects that is the ratio of the existing level of exposure to an acceptable level of exposure. A value equal to or less than one indicates that the human population is not likely to experience adverse effects.

HQ: Hazard Quotient. HQs are used to evaluate noncarcinogenic health effects and ecological risks. A value equal to or less than one indicates that the human or ecological population are not likely to experience adverse effects.

IGWSCC: Impact to Ground Water Soil Cleanup Criteria.

ICs: Institutional Controls. Administrative methods to prevent human exposure to contaminants, such as by restricting the use of groundwater for drinking water purposes.

Nine Evaluation Criteria: See text box on Page 10.

Noncarcinogenic Risk: Noncancer Hazards (or risk) are expressed as a quotient that compares the existing level of exposure to the acceptable level of exposure. There is a level of exposure (the reference dose) below which it is unlikely for even a sensitive population to experience adverse health effects. USEPA's threshold level for noncarcinogenic risk at Superfund sites is 1, meaning that if the exposure exceeds the threshold; there may be a concern for potential noncancer effects.

NJDEP: New Jersey Department of Environmental Protection

NPL: National Priorities List. A list developed by USEPA of uncontrolled hazardous substance release sites in the United States that are considered priorities for long-term remedial evaluation and response.

Operable Unit (OU): a discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site.

Present-Worth Cost: Total cost, in current dollars, of the remedial action. The present-worth cost includes capital costs required to implement the remedial action, as well as the cost of long-term operations, maintenance, and monitoring.

Proposed Plan: A document that presents the preferred remedial alternative and requests public input regarding the proposed cleanup alternative.

Public Comment Period: The time allowed for the members of a potentially affected community to express views and concerns regarding USEPA's preferred remedial alternative.

RAOs: Remedial Action Objectives. Objectives of remedial actions that are developed based on contaminated media, contaminants of concern, potential receptors and exposure scenarios, human health and ecological risk assessment, and attainment of regulatory cleanup levels.

Record of Decision (ROD): A legal document that describes the cleanup action or remedy selected for a site, the basis for choosing that remedy, and public comments on the selected remedy.

Remedial Action: A cleanup to address hazardous substances at a site.

RI: Remedial Investigation. A study of a facility that supports the selection of a remedy where hazardous substances have been disposed or released. The RI identifies the nature and extent of contamination at the facility and analyzes risk associated with COPCs.

SVOC: Semi-Volatile Organic Compound. Type of chemical that somewhat vaporizes, often producing a distinguishable odor.

TBCs: "To-be-considereds," consists of non-promulgated advisories and/or guidance that were developed by EPA, other federal agencies, or states that may be useful in developing CERCLA remedies.

USEPA: United States Environmental Protection Agency. The Federal agency responsible for administration and enforcement of CERCLA (and other environmental statutes and regulations), and final approval authority for the selected ROD.

VOC: Volatile Organic Compound. Type of chemical that readily vaporizes, often producing a distinguishable odor.

APPENDIX I

FIGURES

Figure 1

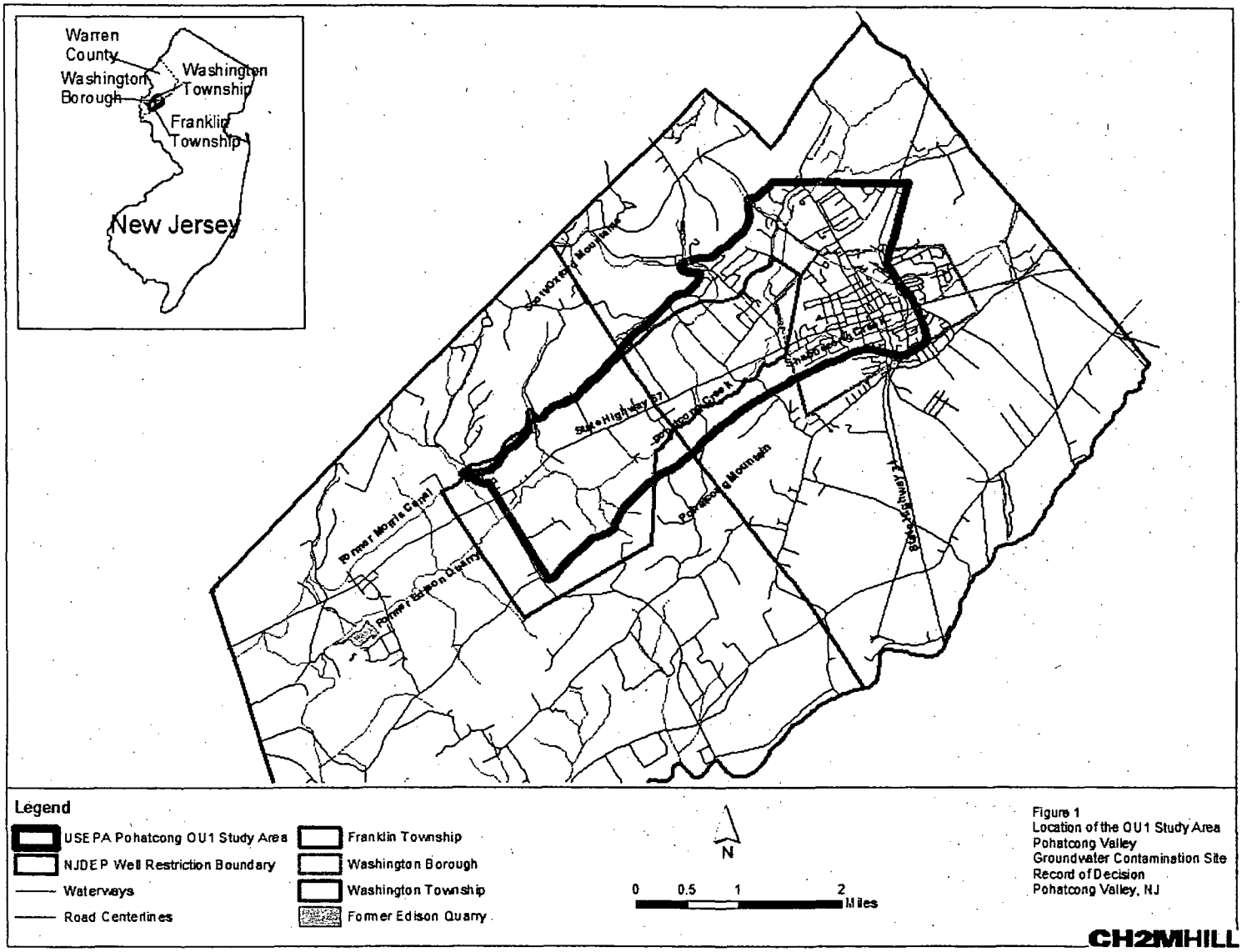
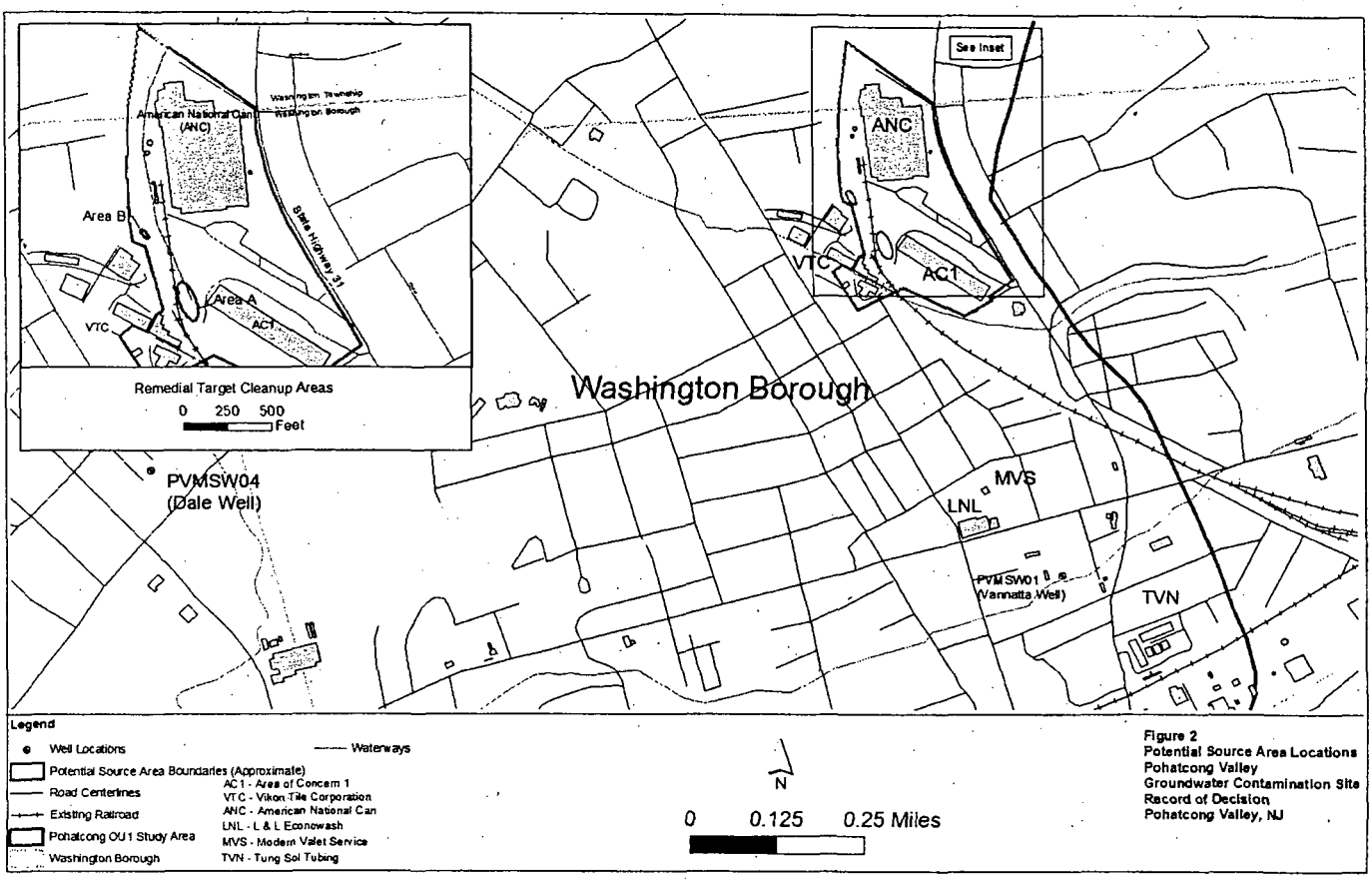

Warren County
Washington Borough
Washington Township
Franklin Township
New Jersey
Scott Road
Scott Mountain
Shabbecong Creek
State Highway 57
Pohatcong Creek
Pohatcong Mountain
Former Morris Canal
Former Edison Quarry
Legend
USEPA Pohatcong OU1 Study Area
NJDEP Well Restriction Boundary
Waterways
Road Centerlines
Franklin Township
Washington Borough
Washington Township
Former Edison Quarry
N
0 0.5 1 2
Miles
Figure 1
Location of the OU1 Study Area
Pohatcong Valley
Groundwater Contamination Site
Record of Decision
Pohatcong Valley, NJ
CH2MHILL

Figure 2



500043

Figure 3

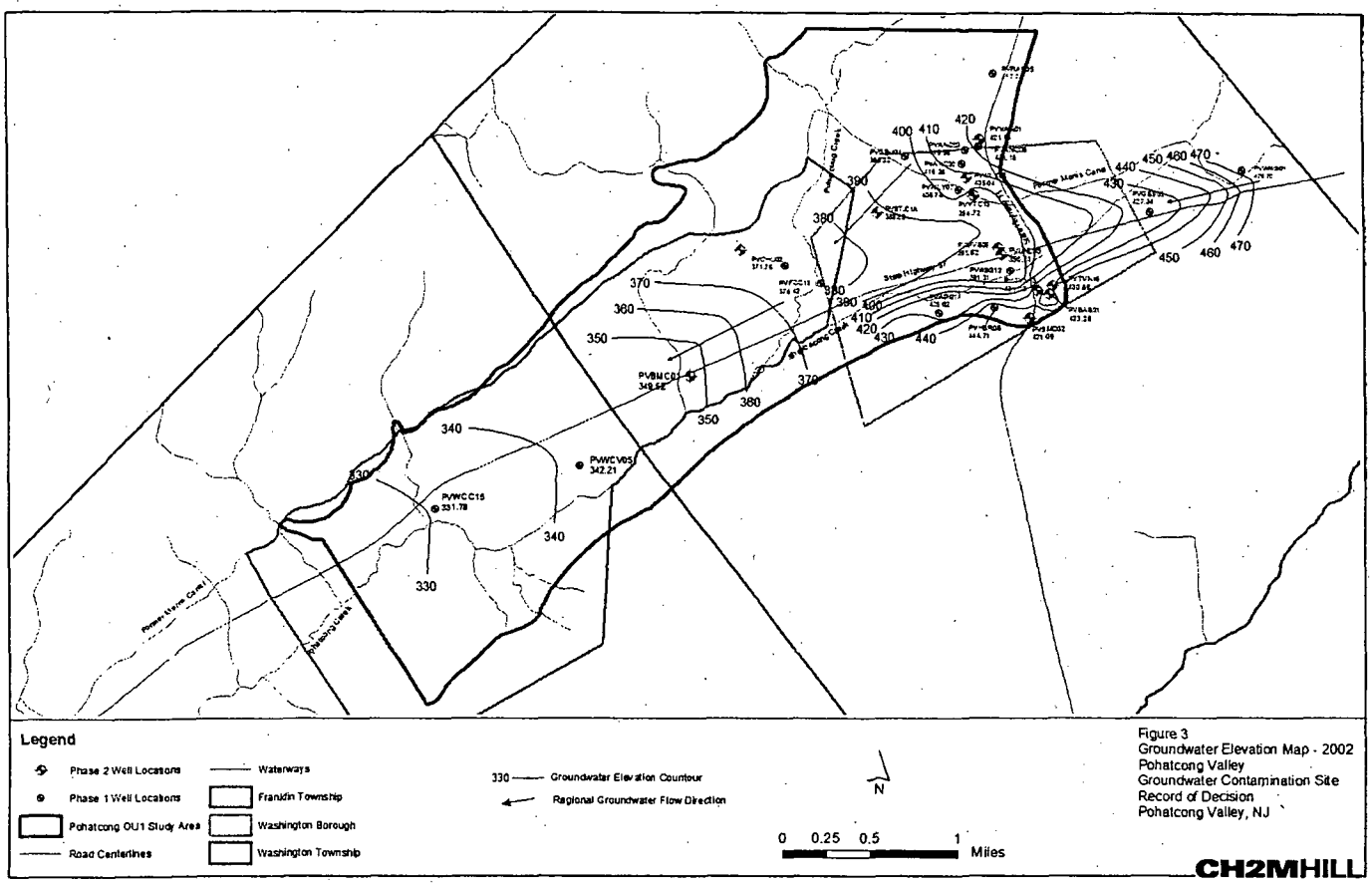

Legend
Phase 2 Well Locations
Phase 1 Well Locations
Pohatcong OU1 Study Area
Road Centerlines
Waterways
Franklin Township
Washington Borough
Washington Township
330 Groundwater Elevation Countour
Regional Groundwater Flow Direction
N
0 0.25 0.5 1
Miles
Figure 3
Groundwater Elevation Map - 2002
Pohatcong Valley
Groundwater Contamination Site
Record of Decision
Pohatcong Valley, NJ
CH2MHILL

Figure 4

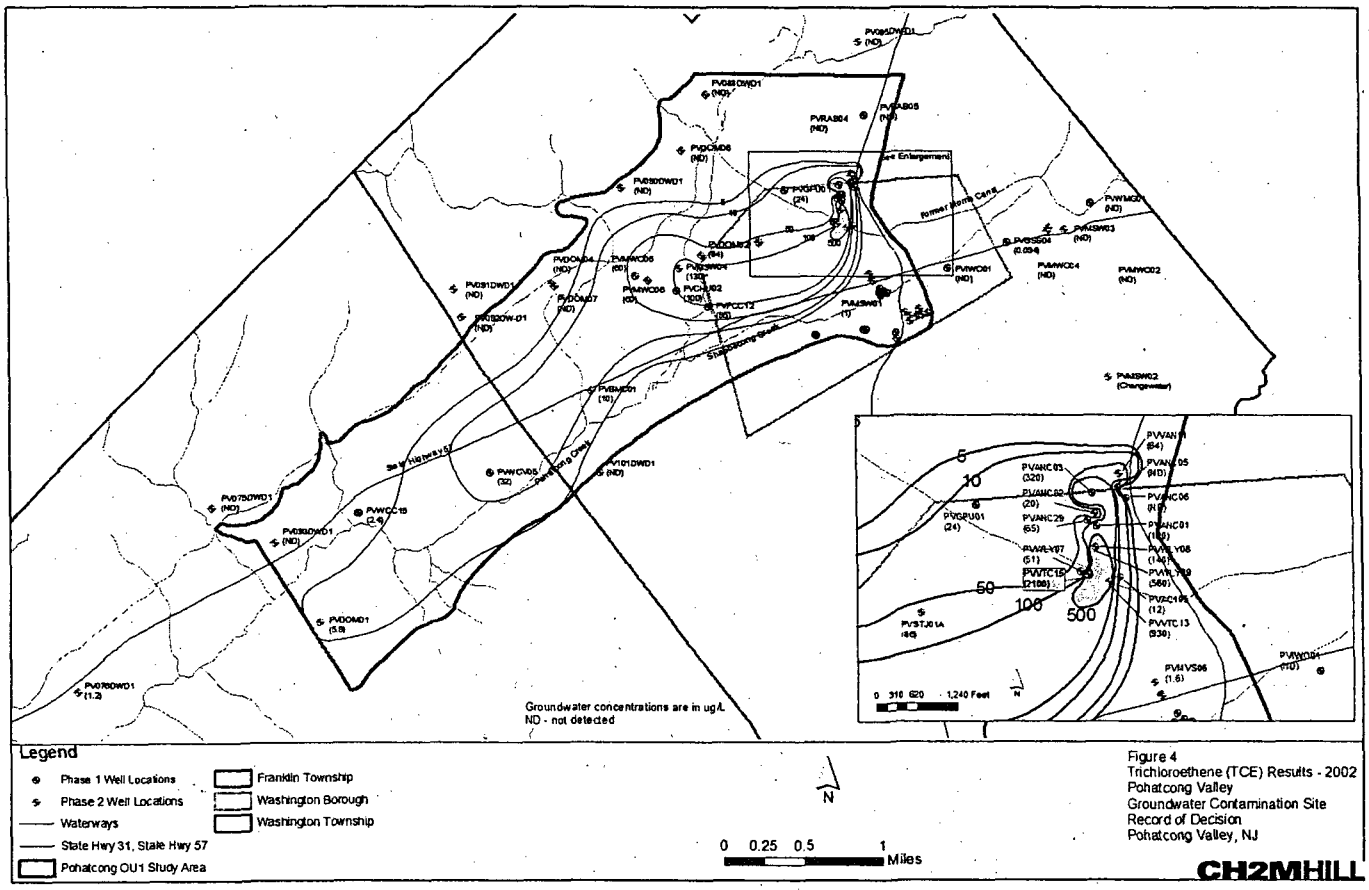

Groundwater concentrations are in ug/L
ND - not detected
Legend
Phase 1 Well Locations
Phase 2 Well Locations
Waterways
State Hwy 31, State Hwy 57
Pohatcong OU1 Study Area
Franklin Township
Washington Borough
Washington Township
N
0 0.25 0.5 1
Miles
Figure 4
Trichloroethene (TCE) Results - 2002
Pohatcong Valley
Groundwater Contamination Site
Record of Decision
Pohatcong Valley, NJ
CH2MHILL

Figure 5

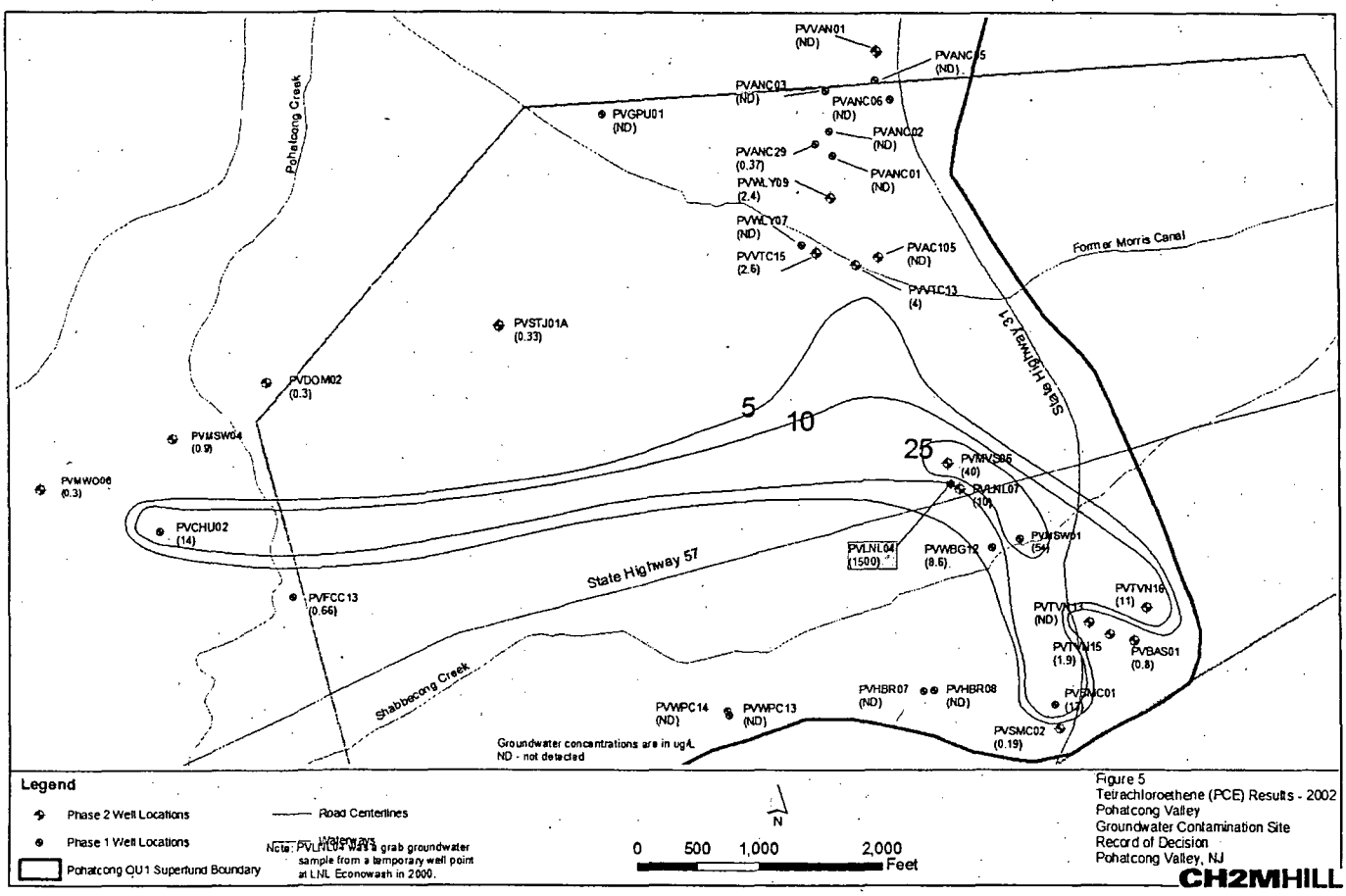

PVVAN01 (ND)
PVANC05 (ND)
PVANC03 (ND)
PVANC06 (ND)
PVGPU01 (ND)
PVANC02 (ND)
PVANC29 (0.37)
PVANC01 (ND)
PVWLY09 (2.4)
PVWLY07 (ND)
PVVTC15 (2.6)
PVAC105 (ND)
PVVTC13 (4)
Former Morris Canal
Pohatcong Creek
PVSTJ01A (0.33)
PVDOM02 (0.3)
PVMSW04 (0.9)
PVMWO06 (0.3)
PVCHU02 (14)
PVFCC13 (0.66)
5
10
25
PVMVS05 (40)
PVVNL07 (10)
PVMSW01 (54)
PVLNL04 (1500)
PVWBG12 (8.6)
State Highway 57
State Highway 31
PVTVN16 (11)
PVTVN13 (ND)
PVTVN15 (1.9)
PVBAS01 (0.8)
PVHBR07 (ND)
PVHBR08 (ND)
PVBMC01 (12)
PVWPC14 (ND)
PVWPC13 (ND)
PVSMC02 (0.19)
Shabbacong Creek
Groundwater concentrations are in ug/L
ND - not detected
Legend
Phase 2 Well Locations
Phase 1 Well Locations
Pohatcong OU1 Superfund Boundary
Road Centerlines
Waterways
Note: PVLNL04 was a grab groundwater sample from a temporary well point at LNL Econowash in 2000.
N
0 500 1,000 2,000
Feet
Figure 5
Tetrachloroethene (PCE) Results - 2002
Pohatcong Valley
Groundwater Contamination Site
Record of Decision
Pohatcong Valley, NJ
CH2MHILL

Figure 6

THE NINE SUPERFUND EVALUATION CRITERIA

1. **Overall Protectiveness of Human Health and the Environment** evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

3. **Long-term Effectiveness and Permanence** considers the ability of an alternative to maintain protection of human health and the environment over time.

4. **Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment** evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

5. **Short-term Effectiveness** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

6. **Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. **Cost** includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. **State/Support Agency Acceptance** considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

9. **Community Acceptance** considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

APPENDIX II

TABLES

TABLE 1

Page 1 of 4

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
PVGCS Area Regional Groundwater - TCE Plume	Antimony	1.6	8.3	ug/l	4/44	8.3	ug/l	Max
	Arsenic	1.8	24.2	ug/l	8/44	5.77	ug/l	95% Cheb-m
	Cadmium	2.7	12.3	ug/l	3/44	3.88	ug/l	95% Cheb-m
	Chromium	0.65	518	ug/l	25/41	89.7	ug/l	95% Cheb
	Iron	18	204,000	ug/l	35/46	54,463	ug/l	99% Cheb-m
	Manganese	0.47	4,350	ug/l	32/46	1,987	ug/l	97.5% Cheb
	Thallium	3.3	23.1	ug/l	3/44	5.36	ug/l	95% Cheb-m
	Vanadium	0.64	107	ug/l	18/44	38	ug/l	99% Cheb-m
	Tetrachloroethylene	0.2	61	ug/l	26/53	16.3	ug/l	97.5% Cheb-m
	Trichloroethylene	1	2,100	ug/l	49/53	422	ug/l	97.5% Cheb-m

TABLE 1

Page 2 of 4

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
PVGCS Area Regional Groundwater - PCE Plume	Aluminum	21	290,000	ug/l	13/14	228,340	ug/l	99% Cheb-m
	Antimony	3.2	3.15	ug/l	1/13	3.15	ug/l	Max
	Arsenic	3	11.9	ug/l	2/13	11.9	ug/l	Max
	Barium	15	1560	ug/l	13/14	1,560	ug/l	Max
	Beryllium	0.19	1,700	ug/l	7/13	1,434	ug/l	99% Cheb-m
	Cadmium	5.9	5.9	ug/l	1/13	5.7	ug/l	99% Cheb-m
	Chromium	6	1,100	ug/l	6/12	1,010	ug/l	99% Cheb-m
	Copper	1.6	610	ug/l	11/13	349	ug/l	99% Cheb
	Iron	35	186,000	ug/l	11/14	186,000	ug/l	Max
	Manganese	0.1	11,600	ug/l	9/13	11,600	ug/l	Max
	Nickel	0.5	106	ug/l	7/14	106	ug/l	Max
	Thallium	3.3	27.1	ug/l	2/13	15.7	ug/l	95% Cheb-m
	Vanadium	0.5	200	ug/l	5/13	183.6	ug/l	99% Cheb-m
	Tetrachloroethylene	1.6	1,500	ug/l	14/14	380	ug/l	99% Cheb
	Trichloroethlyene	0.3	110	ug/l	11/14	110	ug/l	Max

TABLE 1

Page 3 of 4

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Subsurface soil
Exposure Medium: Subsurface soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Subsurface soil at ANC	Aluminum	16,000	44,800	mg/kg	16/16	26,410	mg/kg	95% UCL-T
	Chromium	5.4	231	mg/kg	16/16	88.2	mg/kg	95% Cheb-m
	Iron	23,000	35,600	mg/kg	16/16	32,460	mg/kg	95% Cheb-m
	Manganese	490	1,700	mg/kg	9/9	1,700	mg/kg	Max

TABLE 1

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Subsurface soil at AC1	Aluminum	11,000	37,500	mg/kg	3/3	37,500	mg/kg	Max
	Iron	14,000	35,500	mg/kg	3/3	35,500	mg/kg	Max
	Manganese	210	833	mg/kg	3/3	883	mg/kg	Max
	Trichloroethylene	0.008	52	mg/kg	2/3	52	mg/kg	Max

Key

ug/kg: microgram/kilogram
ug/l: microgram/liter
Max: Maximum Concentration
95% UCL - T: 95% Upper Confidence Limit -T Statistic
95% Cheb: 95% Upper Confidence Limit - Chebyshev Statistic (MVUE)
97.5% Cheb: 97.5% Upper Confidence Limit - Chebyshev Statistic (MVUE)
95% Cheb-m: 95% Upper Confidence Limit - Chebyshev Statistic (mean, STD)
97.5% Cheb-m: 97.5% Upper Confidence Limit - Chebyshev Statistic (mean, STD)
99% Cheb-m: 99% Upper Confidence Limit - Chebyshev Statistic (mean, STD)

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

The table presents the chemicals of concern (COPCs) and exposure point concentration for each of the COPCs detected in Mackenzie Chemical soils and the groundwater (*i.e.*, the concentration that will be used to estimate the exposure and risk from each COPC in each media). The table includes the range of concentrations detected for each COPC, as well as the frequency of detection(i.e., the number of times the chemical was detected in the samples collected at the site), the exposure point concentration (EPC), and how the EPC was derived.

TABLE 2

Page 1 of 3

Selection of Exposure Pathways

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Rationale for Selection/ Exclusion of Exposure Pathway
Future	Groundwater	Groundwater	PVGCS Area Regional Groundwater - TCE Plume and PCE Plume (Tap water)	Resident	Adult	Ingestion	Onsite	Groundwater could be used as a potable water supply in the future.
						Dermal	Onsite	Groundwater could be used as a potable water supply in the future.
					Child	Ingestion	Onsite	Groundwater could be used as a potable water supply in the future.
						Dermal	Onsite	Groundwater could be used as a potable water supply in the future.
		Air	PVGCS Area Regional Groundwater - TCE Plume and PCE Plume (Shower Head)	Resident	Adult	Inhalation	Onsite	Groundwater could be used as a potable water supply in the future.
						Dermal	Onsite	Groundwater could be used as a potable water supply in the future.
					Child	Inhalation	Onsite	Groundwater could be used as a potable water supply in the future.
					Child	Dermal	Onsite	Groundwater could be used as a potable water supply in the future.

TABLE 2

Page 2 of 3

Selection of Exposure Pathways

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Rationale for Selection/ Exclusion of Exposure Pathway
Future	Soil	Surface and Subsurface Soil	Surface and subsurface soil at ANC and AC1	Resident	Adult	Ingestion	Onsite	Future residents could contact surface and subsurface soil.
						Dermal	Onsite	Future residents could contact surface and subsurface soil.
					Child	Ingestion	Onsite	Future residents could contact surface and subsurface soil.
						Dermal	Onsite	Future residents could contact surface and subsurface soil.
				Industrial Worker	Adult	Ingestion	Onsite	Future industrial workers could contact surface and subsurface soil.
						Dermal	Onsite	Future industrial workers could contact surface and subsurface soil.
						Inhalation	Onsite	Future industrial workers could contact surface and subsurface soil.
				Construction Worker	Adult	Ingestion	Onsite	Construction workers could contact surface and subsurface soil while performing construction work.

TABLE 2

Page 3 of 3

Selection of Exposure Pathways

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Rationale for Selection/ Exclusion of Exposure Pathway
Future	Soil	Surface and Subsurface Soil	Surface and subsurface soil at ANC and AC1	Construction Worker	Adult	Dermal	Onsite	Construction workers could contact surface and subsurface soil while performing construction work.
						Inhalation	Onsite	Construction workers could contact surface and subsurface soil while performing construction work.

Summary of Selection of Exposure Pathways

The table presents all exposure pathways considered for the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 3
Page 1 of 2
Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Aluminum	Chronic	1.0E+00	mg/kg-day	1.0	1.0E+00	mg/kg-day	CNS	100	NCEA	06/21/01
Antimony	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Blood	1000/1	IRIS	01/31/03
Antimony	Subchronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Blood	1000	HEAST	07/01/97
Arsenic	Chronic	3.0E-04	mg/kg-day	0.95	3.0E-04	mg/kg-day	Skin, vascular	3/1	IRIS	01/31/03
Arsenic	Subchronic	3.0E-04	mg/kg-day	0.95	3.0E-04	mg/kg-day	Skin, vascular	3	HEAST	07/07/97
Barium	Chronic	7.0E-02	mg/kg-day	0.07	4.9E-03	mg/kg-day	Cardiovas cular	3/1	IRIS	03/04/04
Barium	Subchronic	7.0E-02	mg/kg-day	0.07	4.9E-03	mg/kg-day	Cardiovas cular	3	HEAST	07/01/97
Beryllium	Chronic	2.0E-3	mg/kg-day	0.007	1.4E-05	mg/kg-day	Gastroint estinal	300/1	IRIS	01/31/03
Beryllium	Subchronic	5.0E-03	mg/kg-day	0.007	3.5E-05	mg/kg-day	NOAEL	100	HEAST	07/01/97
Cadmium (food)	Chronic	1.0E-03	mg/kg-day	0.025	2.5E-05	mg/kg-day	Kidney	10/1	IRIS	11/25/02
Cadmium (water)	Chronic	5.0E-04	mg/kg-day	0.05	2.5E-05	mg/kg-day	Kidney	10/1	IRIS	11/25/02
Chromium (VI)	Chronic	3.0E-03	mg/kg-day	0.025	7.5E-05	mg/kg-day	None	300/3	IRIS	01/31/03
Chromium (III)	Subchronic	2.0E-02	mg/kg-day	0.025	5.0E-04	mg/kg-day	NOAEL	100	HEAST	07/01/97
Copper	Chronic	4.0E-02	mg/kg-day	1	4.0E-02	mg/kg-day	Gastroint estinal	NA	HEAST	07/01/97
Iron	Chronic	3.0E-01	mg/kg-day	1.0	3.0E-01	mg/kg-day	Gastroint estinal	1	NCEA	06/21/01
Manganese (non-food)	Chronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	CNS	1	IRIS	01/31/03
Nickel, soluble salts	Chronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	Weight	300/1	IRIS	06/16/03
Nickel, soluble salts	Chronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	Weight	300	HEAST	07/01/97
Tetrachloroethylene	Chronic	1.0E-02	mg/kg-day	1.0	1.0E-02	mg/kg-day	Liver	1000/1	IRIS	01/31/03
Thallium	Chronic	6.6E-05	mg/kg-day	1.0	6.6E-05	mg/kg-day	Liver, blood	3000/1	IRIS	01/31/03
Trichloroethylene	Chronic	3.0E-04	mg/kg-day	1.0	3.0E-04	mg/kg-day	Liver, kidney	3000	NCEA	08/01/01
Vanadium	Chronic	1.0E-03	mg/kg-day	0.026	2.6E-05	mg/kg-day	Kidney	100	NCEA	05/01/00

TABLE 3
Page 2 of 2
Non-Cancer Toxicity Data Summary

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates:
Aluminum	Chronic	4.9E-03	mg/m3	1.4E-03	mg/kg/day	CNS	300	NCEA	08/13/99
Chromium	Chronic	8.0E-06	mg/m3	2.3E-06	mg/kg/day	Respiratory	90/1	IRIS	01/31/03
Manganese	Chronic	5.0E-05	mg/m3	1.4E-05	mg/kg/day	CNS.	1000/1	IRIS	01/31/03
Trichloroethylene	Chronic	4.0E-02	mg/m3	1.0E-02	mg/kg/day	CNS, Liver	1000	NCEA	08/01/01

Key

NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA
HEAST: Health Effects Assessment Summary Tables, U.S. EPA
NCEA: National Center for Environmental Assessment, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in groundwater and soil. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

TABLE 4
Page 1 of 1
Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Arsenic	1.5E+00	mg/kg-day	1.5E+00	mg/kg-day	A	IRIS	01/31/03
Tetrachloroethylene	5.4E-01	mg/kg-day	5.4E-01	mg/kg-day	B2/C	CalEPA	06/12/03
Trichloroethene	4.0E-01	mg/kg-day	4.0E-01	mg/kg-day	B1	NCEA	08/01/01

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Tetrachloroethylene	5.7E-06	(ug/m3)-1	2.0E-02	mg/kg-day -1	B2/C	CalEPA	06/12/03
Trichloroethene	1.1E-04	(ug/m3)-1	4.0E-01	mg/kg-day -1	B1	NCEA	08/01/01

Key:
NA - No information available
IRIS - Integrated Risk Information System, U.S. EPA
NCEA - National Center for Environmental Assessment
HEAST - Health Effects Assessment Summary Tables
CalEPA - California Environmental Protection Agency

EPA Group:
A - Human carcinogen
B1 - Probable Human Carcinogen - Indicates that limited human data are available
B2 - Probable Human Carcinogen - Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in groundwater and soils. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5

Page 1 of 8

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - TCE Plume	Tap water	Trichloroethylene	Liver, Kidney, Fetus	2.9		0.5	3.4
			Chromium	None	0.82		0.34	1.2
			Iron	Gastrointestinal	4.9		0.025	4.9
			Manganese	CNS	2.7		0.36	3.1
			Thallium	Liver, Blood, Hair	2.2		0.012	2.2
			Vanadium	Kidney	1.0		0.21	1.2
							Groundwater Hazard Index Total =	16
		Shower Head	Trichloroethylene	CNS, Liver, Endocrine system		73		73
							Groundwater Hazard Index Total =	73

TABLE 5

Page 2 of 8

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - TCE Plume	Tap water	Trichloroethylene	Liver, Kidney, Fetus	6.7		1.1	7.9
			Antimony	Blood	1.3		0.058	1.4
			Arsenic	Skin, Vascular	1.2		0.0083	1.2
			Chromium	None	1.9		1.0	2.9
			Iron	Gastrointestinal	11		0.075	11
			Manganese	CNS	6.4		1	7.4
			Thallium	Liver, Blood, Hair	5.2		0.034	5.2
			Vanadium	Kidney	2.4		0.62	3.0
							Groundwater Hazard Index Total =	40
		Shower Head	Trichloroethylene	CNS, Liver, Endocrine system		160		160
							Groundwater Hazard Index Total =	160

TABLE 5

Page 3 of 8

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - TCE Plume	Tap Water	Trichloroethylene	Liver, Kidney, Fetus	1.0		0.36	1.4
			Iron	Gastrointestinal	1.7		0.018	1.8
			Manganese	CNS	0.97		0.25	1.2
							Groundwater Hazard Index Total =	4.4
		Shower Head	Trichloroethylene	Liver, Kidney, Fetus		52		52
							Groundwater Hazard Index Total =	52

TABLE 5

Page 4 of 8

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Tap water	Tetrachloroethylene	Liver	1.0		0.62	1.7
			Trichloroethylene	Liver, Kidney, Fetus	10		1.7	12
			Aluminum	CNS	6.3		0.033	6.3
			Arsenic	Skin, Vascular	1.1		0.0057	1.1
			Chromium	None	9.2		3.9	13
			Iron	Gastrointestinal	17		0.089	17
			Manganese	CNS	250		33	290
			Thallium	Liver, Blood, Hair	4800		25	4,800
							Groundwater Hazard Index Total =	5,141
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Shower Head	Trichloroethylene	CNS, Liver, Endocrine system		1.7		1.7
							Groundwater Hazard Index Total =	1.7

TABLE 5

Page 5 of 8

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Tap water	Tetrachloroethylene	Liver	2.4		4.5	7.0
			Trichloroethylene	Liver, Kidney, Fetus	23		44	67
			Aluminum	CNS	15		2.4	17
			Antimony	Blood	0.5		0.55	1.1
			Arsenic	Skin, Vascular	2.5		0.42	3.0
			Barium	Kidney	1.4		3.4	4.8
			Beryllium	Gastrointestinal	46		1,100	1,100
			Cadmium	Kidney	0.73		2.4	3.1
			Chromium	None	22		140	162
			Copper	Gastrointestinal	1.1		0.18	1.3
			Iron	Gastrointestinal	40		6.5	46
			Manganese	CNS	590		2,500	3,090
			Nickel	Decreased weight	0.37		1.5	1.9
			Thallium	Liver, Blood, Hair	11,000		1,900	12,900
			Vanadium	Kidney	6.8		43	50
							Groundwater Hazard Index Total =	17,454
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Shower Head	Tetrachloroethylene	Liver, Whole body		4.1		4.1
			Trichloroethylene	CNS, Liver, Endocrine system		20		20
							Groundwater Hazard Index Total =	24

TABLE 5

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Tap Water	Trichloroethylene	Liver, Kidney, Fetus	3.6		1.2	4.8
			Beryllium	Gastrointestinal	7.0		10	17
			Chromium	None	3.3		2.8	6.0
			Iron	Gastrointestinal	6.1		0.063	6.1
			Manganese	CNS	91		24	115
			Thallium	Liver, Blood, Hair	1,700		18	1,718
			Vanadium	Kidney	1.0		0.42	1.4
							Groundwater Hazard Index Total =	1,868
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Shower Head	Trichloroethylene	Liver, Kidney, Fetus		1.2		1.2
							Groundwater Hazard Index Total =	1.2

TABLE 5

Page 7 of 8

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface soil	Subsurface soil	Subsurface soil at ANC	Iron	Gastrointestinal	1.4			1.4
			Manganese	CNS	1.1			1.1
							Soil Hazard Index Total =	2.5
Subsurface soil	Subsurface soil	Subsurface soil at AC1	Iron	Gastrointestinal	1.5			1.5
			Trichloroethylene	CNS, Liver, Endocrine system	2.2			2.2
							Soil Hazard Index Total =	3.7
Subsurface soil	Air from Emissions	Emissions from Subsurface soil at AC1	Trichloroethylene	CNS, Liver, Endocrine system		1.4		1.4
							Soil Hazard Index Total =	1.4

TABLE 5

Page 8 of 8

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface soil	Air from Emissions	Emissions from Subsurface soil at ANC	Aluminum	CNS		1.1		1.1
			Chromium	Respiratory		2.3		2.3
			Manganese	CNS		7.2		7.2
							Soil Hazard Index Total =	10.6
Subsurface soil	Air from Emissions	Emissions from Subsurface soil at AC1	Aluminum	CNS		1.5		1.5
			Manganese	CNS		3.5		3.5
			Trichloroethylene	CNS, Liver, Endocrine system		2.1		2.1
							Soil Hazard Index Total =	7.1

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

TABLE 6

Page 1 of 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - TCE Plume	Tap water	Tetrachloroethylene	1.3E-04		7.7E-05	2.1E-04
			Trichloroethylene	2.5E-03		4.3E-04	2.9E-03
			Arsenic	1.3E-04		7.4E-07	1.3E-04
						Total Risk =	3.2E-03
Groundwater	PVGCS Area Regional Groundwater - TCE Plume	Shower Head	Trichloroethylene		3.5E-02		3.5E-02
						Total Risk =	3.5E-02

TABLE 6

Page 2 of 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - TCE Plume	Tap water	Trichloroethylene	5.9E-04		2.0E-04	7.9E-04
						Total Risk =	7.9E-04
Groundwater	PVGCS Area Regional Groundwater - TCE Plume	Shower Head	Tetrachloroethylene		1.4E-04		1.4E-04
			Trichloroethylene		7.4E-02		7.4E-02
						Total Risk =	7.4E-02

TABLE 6

Page 3 of 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Tap Water	Tetrachloroethylene	3.1E-03		3.2E-03	6.3E-03
			Trichloroethylene	6.6E-04		5.2E-04	1.2E-03
			Arsenic	2.7E-04		1.7E-05	2.8E-04
						Total Risk =	7.8E-03
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Shower Head	Tetrachloroethylene		1.6E-03		1.6E-03
			Trichloroethylene		9.1E-03		9.1E-03
						Total Risk =	1.1E-02

TABLE 6

Page 4 of 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Tap Water	Tetrachloroethylene	7.2E-04		8.6E-04	1.6E-03
			Trichloroethylene	1.5E-04		5.3E-05	2.1E-04
						Total Risk =	1.8E-03
Groundwater	PVGCS Area Regional Groundwater - PCE Plume	Shower Head	Tetrachloroethylene		3.0E-04		3.0E-4
			Trichloroethylene		1.7E-03		1.7E-03
						Total Risk =	2.0E-03

TABLE 6

Page 5 of 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air Emissions from Subsurface Soil	Emissions from Subsurface Soil at AC1	Trichloroethylene		1.2E-03		1.2E-03
						Total Risk =	1.2E-03
Subsurface Soil	Air Emissions from Subsurface Soil	Emissions from Subsurface Soil at AC1	Trichloroethylene		4.6E-04		4.6E-04
						Total Risk =	4.6E-04

TABLE 6

Page 6 of 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air Emissions from Subsurface Soil	Emissions from Subsurface Soil at AC1	Trichloroethylene		1.2E-04		1.2E-04
						Total Risk =	1.2E-04

Summary of Risk Characterization - Carcinogens

The table presents risk estimates for the significant routes of exposure. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of the receptors exposure to soil and groundwater, as well as the toxicity of the COCs.

TABLE 7
COMPARISON OF TOTAL COST OF REMEDIAL ALTERNATIVES
Page 1 of 1

Site:	PVGCS OU1 Study Area	**Base Year:**	2005
Location:	Groundwater Media	**Date:**	April 25, 2005
Phase:	Feasibility Study		

	Groundwater Alternative GW1 No Further Action	Groundwater Alternative GW2 Source Treatment and MNA	Groundwater Alternative GW3 Expanded Source Treatment and MNA	Groundwater Alternative GW4 Entire Plume Collection and Treatment
Total Project Duration (Years)	60	55	47	22
Capital Cost	$0	$2,552,000	$3,399,000	$10,811,000
Annual O&M Cost	$0	$606,000	$996,000	$2,373,000
Total Cost	$0	$9,350,000	$48,347,000	$63,077,000
Total Present Value of Alternative	$0	$8,060,000	$25,760,000	$46,840,000

Disclaimer: The information in this cost estimate is based on the best available information regarding the anticipated scope of the remedial alternatives. Changes in the cost estimates are likely to occur as a result of new information and data collected during the engineering design of the remedial alternatives. This is an order-of-magnitude cost estimate that is expected to be within -30 to +50 percent of the actual project costs.

TABLE 8

Cost Estimate Summary: Selected Groundwater Remedy - Source Treatment and MNA

Site: PVGCS OU1 Study Area
Location: Groundwater Media
Phase: Feasibility Study
Base Year: 2005
Date: 4/25/2005

Description: Containment of TCE plume over 500 ug/L through series of 3 pumping wells and one pumping well for PCE. Total flows of 420 gpm (TCE plume) and 100 gpm (PCE plume). Assumes two treatment systems operating for 11 years.

CAPITAL COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Groundwater Use Restrictions	1	LS	$15,000	$15,000	
Pre-Design Investigations					
Install New Monitoring Wells					
Mobilization/Demobilization	1	LS	$25,000	$25,000	
Soil Borings	1,360	FT	$47	$63,920	Miller Drilling Quote.
2" Well Casing	1,360	FT	$15	$20,400	33-23-0101
2" Well Screen	1,360	FT	$25	$34,000	33-23-0256
Installation Oversight Labor	160	HR	$80	$12,800	CH2M Est.
SUBTOTAL				$156,120	
Contingency	30%			$46,836	10% Scope + 20% Bid
SUBTOTAL				$202,956	
Sample Existing and New Wells					
Groundwater Samples	58	LS	$110	$6,380	Contractor Estimate
QC Samples	7.8	LS	$110	$858	Contractor Estimate
Sampling Labor	120	HRS	$80	$9,600	CH2M Est. - 2 persons
Equipment - meters	1	LS	$2,000	$2,000	CH2M Est.
Consumables	1	LS	$400	$400	CH2M Est.
Data Validation	32.9	HRS	$80	$2,632	CH2M Est.
Reporting	16	HRS	$80	$1,280	CH2M Est.
SUBTOTAL				$23,150	
Allowance for Misc. Items	20%			$4,630	
SUBTOTAL				$27,780	
Contingency	30%			$8,334	10% Scope + 20% Bid
				$36,114	
Site Preparation					
Site Preparation	1	LS	$10,000	$10,000	
Silt Fencing and Erosion Controls (Temp.)	1	LS	$500	$500	
Surveying	1	LS	$0	$0	
SUBTOTAL				$10,500	
Water Supply Connection					
Door-to-Door Survey	40	HR	$80	$3,200	
Connection to Municipal Supply System(100')	30	LS	$3,000	$90,000	
Connection to Municipal Supply System(1000')	30	LS	$4,500	$135,000	
Home Well Abandonment	16,500	LF	$10	$165,000	Contractor Estimate
SUBTOTAL				$393,200	
ANC Production Well Treatment					
Shallow Tray Air Stripper	1	EA	$105,000	$105,000	Contractor Estimate
Miscellaneous Piping and Fittings	1	LS	$2,000	$2,000	
SUBTOTAL				$107,000	

TABLE 8

Cost Estimate Summary: Selected Groundwater Remedy - Source Treatment and MNA

CAPITAL COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Groundwater Extraction/Injection Wells					
TCE PLUME					
Mobilization	1	LS	$24,264	$24,264	
12-inch Borehole	980	LF	$30	$29,400	
8-inch Well Casing	980	LF	$35	$34,300	
Well Grout Seal	980	LF	$20	$19,600	
8-inch Borehole	1400	LF	$25	$35,000	
Well Development	224	HR	$250	$56,000	
25-Horsepower Pump and Motor	4	EA	$20,000	$80,000	
Wellhead Piping, Vault, etc.	7	LS	$7,000	$49,000	
Installation Oversight Labor	160	HR	$80	$12,800	CH2M Est.
SUBTOTAL				$340,364	
PCE PLUME					
Mobilization	1	LS	$5,488	$5,488	
12-inch Borehole	160	LF	$30	$4,800	
8-inch Well Casing	160	LF	$35	$5,600	
Well Grout Seal	160	LF	$20	$3,200	
8-inch Borehole	400	LF	$25	$10,000	
Well Development	64	HR	$250	$16,000	
15-Horsepower Pump and Motor	1	EA	$15,000	$15,000	
Wellhead Piping, Vault, etc.	2	LS	$7,000	$14,000	
Installation Oversight Labor	160	HR	$80	$12,800	CH2M Est.
SUBTOTAL				$86,888	
Groundwater Treatment Systems					
Excavation for Building Foundation	2	LS	$10,000	$20,000	Contractor Estimate
Concrete Building Foundation	2	LS	$15,000	$30,000	Contractor Estimate
Concrete Footer	2	LS	$15,000	$30,000	Contractor Estimate
GW Treatment Building	2	LS	$20,000	$40,000	Contractor Estimate
Miscellaneous (Construction)	1	LS	$5,000	$5,000	CH2M Est.
Paved Access Road	14	TONS	$57	$798	CH2M Est.
10,000 gal Equalization Tank	2	EA	$8,726	$17,452	33-10-9662
Bag Filtration (2 filters/system)	4	EA	$4,334	$17,336	33-13-0117
Air Stripper	2	EA	$105,000	$210,000	Contractor Estimate
Activated Carbon Unit	4	EA	$2,000	$8,000	33-13-1942
4" Venturi Flow Meter	4	EA	$4,000	$16,000	CH2M Est.
4" Steel Pipe (Exposed)	4,000	LF	$13	$50,320	33-26-0104
4" Steel Fittings (Exposed)	20	EA	$119	$2,380	33-27-0534/0552/0562
4" Check Valve	10	EA	$292	$2,920	33-27-0404
4" Butterfly Valve	10	EA	$544	$5,437	33-27-0424
Pressure Gauge Assembly	4	EA	$276	$1,104	Grainger Estimate
Effluent Tank (Gravity Feed)	2	EA	$8,726	$17,452	33-10-9662
Gravity Discharge Piping (8" HDPE)	200	LF	$8	$1,546	33-26-0514
Air Stripper Drain Line (4" HDPE)	100	LF	$4	$391	33-26-0512
Misc. (pipe stands, brackets, etc.)	1	LS	$5,000	$5,000	CH2M Est.
SUBTOTAL				$481,136	
Electrical Service (GW Treatment Systems and Wells)					
Electrical service	1	LS	$10,000	$10,000	CH2M Est.
SUBTOTAL				$10,000	

TABLE 8

Cost Estimate Summary: Selected Groundwater Remedy - Source Treatment and MNA

CAPITAL COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
SUBTOTAL				**$1,683,158**	
Contingency	25%			$420,789	10% Scope + 15% Bid
SUBTOTAL				$2,103,947	
Project Management	5%			$105,197	USEPA 2000, p. 5-13, $2MM-$10MM
Engineering Design and Planning	8%			$168,316	USEPA 2000, p. 5-13, $2MM-$10MM
Construction Management	6%			$126,237	USEPA 2000, p. 5-13, $2MM-$10MM
Permitting (Air and Re-Injection)	1	LS	$30,000	$30,000	CH2M Est.
Operations and Maintenance Manual	1	LS	$7,500	$7,500	CH2M Est.
Procurement	1	LS	$2,500	$2,500	CH2M Est.
Construction Completion and QA/QC Report	1	LS	$8,000	$8,000	CH2M Est.
TOTAL CAPITAL COST				**$2,552,000**	

OPERATIONS AND MAINTENANCE COST

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Treatment Building Property Leasing					
Property Leasing for TCE Treatment Building	15,000	SF	$7	$105,000	OMI Estimate
Property Leasing for PCE Treatment Building	15,000	SF	$7	$105,000	OMI Estimate
Inspection and Monitoring					
Monthly Site Visits					
Labor for Visit/Compliance Sampling	96	HR	$80	$7,680	CH2M Est. - 1 person/mth
Effluent Sampling (GW)	12	LS	$110	$1,320	Contractor Estimate
VOC Analysis (Method TO-14) - Offgas	4	LS	$150	$600	Contractor Estimate
Reporting (Quarterly)	4	LS	$8,000	$32,000	CH2M Est.
Other Expenses (Shipping, supplies, etc.)	1	LS	$1,000	$1,000	CH2M Est.
SUBTOTAL				$42,600	
Allowance for Misc. Items	20%			$8,520	
SUBTOTAL				$51,120	
Contingency	30%			$15,336	
ANC Production Well Treatment Maintenance					
Shallow Tray Air Stripper - Cleaning	1	EA	$10,000	$10,000	CH2M est. - $2500 per quarter
Treatment System Maintenance					
O&M Staff (labor, overheads, vehicles, etc)	2	EA	$120,000	$240,000	OMI Estimate - 2 people
Carbon Usage	1	LS	$40,000	$40,000	OMI Estimate
Line and Pump Acid Cleaning	1	LS	$30,000	$30,000	OMI Estimate
Pump Rebuilds	1	LS	$3,000	$3,000	OMI Estimate
ANC, Vannatta Street, and Dale Avenue Sampling					
Monthly Site Visits					
Labor for Visit/Compliance Sampling	48	HR	$80	$3,840	CH2M Est. - 1 person/mth
Effluent Sampling (GW)	24	LS	$110	$2,640	Contractor Estimate
TOTAL ANNUAL O&M COST				**$606,000**	

TABLE 8

Cost Estimate Summary: Selected Groundwater Remedy - Source Treatment and MNA

PERIODIC COSTS

DESCRIPTION	YEAR	QTY	UNIT	UNIT COST	TOTAL	NOTES
Groundwater Sampling Every 5 years	5					
Groundwater Samples		10	LS	$110	$1,100	Contractor Estimate
QC Samples		4	LS	$110	$440	Contractor Estimate
Groundwater Sampling, Level D						
Labor		48	HRS	$80	$3,840	CH2M Est. - 2 persons
Equipment - meters		1	LS	$500	$500	CH2M Est.
Consumables		1	LS	$200	$200	CH2M Est.
Data Validation		7	HRS	$80	$560	CH2M Est.
Reporting		16	HRS	$80	$1,280	CH2M Est.
SUBTOTAL					$7,920	
Allowance for Misc. Items		20%			$1,584	
SUBTOTAL					$9,504	
Contingency		30%			$2,851	10% Scope + 20% Bid
					Total = $12,355	
Groundwater Sampling Every 5 years						
SUBTOTAL	5				$12,000	(Rounded from Total)
Groundwater Sampling Every 5 years						
SUBTOTAL	10				$12,000	
Groundwater Sampling Every 5 years						
SUBTOTAL	15				$12,000	
Groundwater Sampling Every 5 years						
SUBTOTAL	20				$12,000	
Groundwater Sampling Every 5 years						
SUBTOTAL	25				$12,000	
Groundwater Sampling Every 5 years						
SUBTOTAL	30				$12,000	
Groundwater Sampling Every 5 years						
SUBTOTAL	35				$12,000	
Groundwater Sampling Every 5 years						
SUBTOTAL	40				$12,000	
Groundwater Sampling Every 5 years						
SUBTOTAL	45				$12,000	
Groundwater Sampling Every 5 years						
SUBTOTAL	50				$12,000	
Groundwater Sampling Every 5 years						
SUBTOTAL	55				$12,000	

TABLE 8

Cost Estimate Summary: Selected Groundwater Remedy - Source Treatment and MNA

PRESENT VALUE ANALYSIS		Discount Rate =	3.5%			
COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (3.5%)	PRESENT VALUE	NOTES
CAPITAL COST	0	$2,552,000	$2,552,000	1.000	$2,552,000	
ANNUAL O&M COST	1 to 11	$6,666,000	$606,000	9.002	$5,454,940	
PERIODIC COST	5	$12,000	$12,000	0.84	$10,104	
PERIODIC COST	10	$12,000	$12,000	0.71	$8,507	
PERIODIC COST	15	$12,000	$12,000	0.60	$7,163	
PERIODIC COST	20	$12,000	$12,000	0.50	$6,031	
PERIODIC COST	25	$12,000	$12,000	0.42	$5,078	
PERIODIC COST	30	$12,000	$12,000	0.36	$4,275	
PERIODIC COST	35	$12,000	$12,000	0.30	$3,600	
PERIODIC COST	40	$12,000	$12,000	0.25	$3,031	
PERIODIC COST	45	$12,000	$12,000	0.21	$2,552	
PERIODIC COST	50	$12,000	$12,000	0.18	$2,149	
PERIODIC COST	55	$12,000	$12,000	0.15	$1,809	
		$9,350,000			$8,061,237	
TOTAL PRESENT VALUE OF ALTERNATIVE					**$8,060,000**	

SOURCE INFORMATION

1. United States Environmental Protection Agency. July 2000. A Guide to Preparing and Documenting Cost Estimates During the Feasibility Study. EPA 540-R-00-002. (USEPA, 2000).

TABLE 9
ARARS

Compliance with ARARs

During and at the completion of the response action for the contaminated groundwater, the Selected Remedy will meet the following:

Compliance with action-specific ARARs will be achieved by conducting the remedial action activities in accordance with the following:

- Federal Safe Drinking Water Act - 40 CFR 144 - Establishes performance standards, well requirements, and permitting requirements for groundwater re-injection wells.

- Clean Water Act (CWA) - Section 402 of the CWA, 33 U.S.C. § 1342, and its regulations codified at 40 CFR Part 122, govern discharge of stormwater from construction sites of more than one acre.

- State of New Jersey Statutes and Rules - The New Jersey Pollutant Discharge Elimination System - N.J.A.C. 7:14A - establishes standards for discharge of pollutants to surface and groundwater.

- NJDEP Technical Requirements for Site Remediation - These requirements, codified at N.J.A.C. 7:26E, with specific application and relevance to Subchapters 6, 7, and 8, specify technical standards, permitting requirements, and engineering and institutional controls to be followed at sites undergoing remediation pursuant to New Jersey remediation programs.

- New Jersey Air Quality Regulations - Requirements codified at N.J.A.C. 7:27 are applicable to the generation and emission of air pollutants.

- Federal Clean Water Act - 40 CFR 403 - Prohibits discharge of pollutants to a POTW which cause or may cause pass-through or interference with operations of the POTW.

- Federal Clean Water Act - 40 CFR 414 - Requires specific effluent characteristics for discharge under NPDES permits.

- Federal Clean Water Act - 40 CFR 131.36 - Establishes criteria for surface water quality based on toxicity to aquatic organisms and human health.

- Federal Clean Water Act - Water Quality Criteria Summary - Includes non-promulgated guidance values for surface water based on toxicity to aquatic organisms and human health. Issued by the EPA office of Science and Technology, Health and Ecological Criteria Division.

- Water Pollution Control Act - 33 U.S.C. 1251 - Protects and maintains the chemical, physical, and biological integrity of the nation's water.

- Effluent Limitations - 33 U.S.C. 1251 Section 301 - Technology-based discharge limitations for point sources of conventional, non-conventional, and toxic pollutants.

- Water Quality Related Effluent Limitations - 33 U.S.C. 1251 Section 302 - Protection of intended uses of receiving waters (e.g., public water supply, recreations uses).

- Toxic and Pretreatment Effluent Standards - 33 U.S.C. 1251 Section 307 - Establishes list of toxic pollutants and promulgates pretreatment standards for discharge into POTWs.

- National Pollutant Discharge Elimination System (NPDES) - 33 U.S.C. 1251 - Issues permits for discharge into navigable waters.

- State of New Jersey Statutes and Rules - N.J.A.C. 7:9-6 Groundwater Quality Standards - Establishes standards for the protection of ambient groundwater quality. Used as the primary basis for setting numerical criteria for groundwater cleanups and discharges to groundwater.

- State of New Jersey Statutes and Rules - N.J.A.C. 7:9B Surface Water Quality Standards - Establishes standards for the protection and enhancement of surface water resources.

- Wastewater Discharge Requirements - N.J.A.C. 7:9-5.1 - Minimum treatment requirements and effluent standards for discharge to surface water.

- Worker and Community Right to Know Act - P.L. 1983c.315 P.L. 1985c.543 Executive Order #161 - Notification of presence of hazardous substances to State Emergency Planning Commissions and to local Emergency Planning Committees.

- Safe Drinking Water - N.J.S.A. 58:12A - Regulates periodic testing of Public Community Water Systems.

- Interim Safe Drinking Water Testing Schedule - N.J.A.C. 7:10-14.1 et.seq. - Requires periodic testing, analysis, and reporting for Public Community Water Systems.

- New Jersey Safe Drinking Water Act - N.J.A.C. 7:10 - Sets standards for drinking water including MCLs, disinfecting requirements, secondary drinking water regulations, and monitoring requirements.

- RCRA Hazardous Waste Management Systems, General - 40 CFR 260 - Establishes procedures and criteria for modification or revocation of any provision in 40 CFR Part 260-265.

- Federal Resource Conservation and Recovery Act - 40 CFR 265 - Establishes organic air emission standards for tanks, surface impoundments, and containers.

- Federal Occupational Safety and Health Act - 29 CFR 1904 - Requirements for recording and reporting occupation injuries and illnesses

- Emergency Response Notice of Release of Hazardous Substance to Atmosphere - N.J.S.A. 7:26, 26:2C-19 - Control exposure to air pollution by immediate notification to the department hotline of any air release incident.

- Water Pollution Control - NJAC 7:21(E) - Immediate notification of any spill of hazardous substances.

- Noise Control Act - N.J.S.A. 13:1G-1 et.seq. - Prohibits and restricts noise which unnecessarily degrades the quality of life.

- Disposition of Material Generated During Site Investigations (NJDEP - NJDEP's Guidance Document - Provides guidance on the disposition of IDW.

- Noise Pollution - N.J.A.C. 7:29-1 - Sets maximum limits of sound from any industrial, commercial, public service or community service facility.

- Federal Occupational Safety and Health Act - 29 CFR 1904 - Worker Protection

- General Requirements for Permitting Wells - N.J.A.C. 7:9-7 - Regulates permit procedures, general requirements for drilling and installation of wells, licensing of well driller and pump installer, construction specification, and well casing.

- Sealing of Abandoned Wells - N.J.A.C. 7:9-9 - General requirements for sealing of all wells (e.g., single cased, multiple cased, hand dug, test wells, boreholes and monitoring wells, abandoned wells).

- Well Drillers and Pump Installers Act - N.J.S.A. 58:4A-5 et.seq. - Well drillers licensing, supervision, inspection and sampling.

- Requirement for Groundwater Monitoring - N.J.A.C. 7:26-9 - Groundwater monitoring system requirements.

- Federal Clean Air Act - 40 CFR 60 - Provides emissions requirements for new stationary sources.

- Federal Clean Air Act - 40 CFR 61 - Provides emission standards for 8 contaminants including benzene and vinyl chloride. Identifies 25 additional contaminants, as having serious health effects but does not provide emission standards for these contaminants.

Chemical-Specific ARARs

- State of New Jersey Statutes and Rules - N.J.A.C. 7:9-6 Groundwater Quality Standards - establishes standards for the protection of ambient groundwater quality. Used as the primary basis for setting numerical criteria for groundwater cleanups.

- Federal Safe Drinking Water Act - 40 CFR 143 - Establishes standards for public drinking water systems for those contaminants which impact the aesthetic qualities of drinking water (secondary MCL).

- Quality Criteria for Water - 40 CFR 131 - Sets criteria for water quality based on toxicity to aquatic organisms and human health.

- Federal Clean Water Act; National Pollution Discharge Elimination System (NPDES) - 40 CFR 129 - Establishes effluent standards or prohibitions for certain toxic pollutants; i.e., aldrin/dieldrin, DDT, DDD, DDE, endrin,

toxaphene, benzideine, and PCBs.

- National Ambient Air Quality Standards (NAAQS) - 40 CFR 50 - Defines air quality levels adequate to protect public health/welfare. Defines emissions limitations for sulfur oxides, particulate matter, carbon monoxide, ozone, nitrogen oxide, and lead.

- Federal Resource Conservation and Recovery Act - 40 CFR 264, Subpart F - Establishes standards for groundwater protection for several metals and pesticides.

- Federal Safe Drinking Water Act - 40 CFR 141 - establishes health-based standards for public drinking water systems. Also establishes drinking water quality goals set at levels at which no adverse health effects are anticipated, with an adequate margin of safety.

- Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) - A-280 Amendments - establishes State criteria for drinking water.

- State of New Jersey Statutes and Rules - N.J.A.C. 7:10-7 Safe Drinking Water Act - establishes standards for public drinking water systems for those contaminants which impact the aesthetic qualities of drinking water.

- New Jersey Pollutant Discharge Elimination System (NJPDES) - N.J.A.C. 7:14a - Establishes discharge standards when written into permits.

- Surface Water Criteria - N.J.A.C. 7:9-4 - Criteria for surface water classes.

- Prohibition of Air Pollution and Ambient Air Quality Standards - N.J.A.C. 7:27-5 and N.J.A.C.7:27-13 - Prohibits air pollution and establishes ambient air quality standards.

Location-Specific ARARs

- National Historic Preservation Act - Pursuant to Section 106 of the National Historic Preservation Act, potentially significant cultural resources at the Site must be identified.

- Executive Order 11990, "Protection of Wetlands" - Requires consideration of impacts to wetlands in order to minimize destruction, loss or degradation and to preserve and enhance

wetland values.

- "Freshwater Wetlands Protection Act Rules" - New Jersey requirements codified at N.J.A.C. 7:7A, regulate the disturbance or alteration of freshwater wetlands and their buffers.

- U.S. Army Corps of Engineers Nationwide Permit Program - 33 CFR 330 - prohibits activity that adversely affects a wetland if a practical alternative that has less effect is available.

- EPA's 1985 Statement of "Policy on Floodplains and Wetlands Assessments for CERCLA Action".

- NJDEP standards for soil erosion and sediment control, N.J.A.C. 2:90-1.1, describes the recommended approach and standards to be used for soil erosion and sediment control plans.

- Executive Order Floodplain Management - Exec. Order No. 11988 40 CFR 2 6:302(b) and Appendix A - Requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the maximum extent possible, the adverse impacts associated with direct and indirect development of a floodplain.

- Federal Flood Plains Regulatory Requirements - (RCRA Location Standards (40 CFR 264.18) - This regulation outlines the requirements for constructing a RCRA facility on a 100-year flood plain.

- National Wildlife System - 16 U.S.C. 668 50 CFR 27 - Restricts activities within a National Wildlife Refuge.

- Wild and Scenic Rivers Act - 16 U.S.C. 1274 40 CFR 6:302 - Prohibits adverse effects on scenic rivers.

- Clean Water Act - 33 U.S.C. 1251 Section 404, 40 CFR 230, 231 - Prohibits discharge of dredged or fill material into wetlands without a permit. Preserves and enhances wetlands.

- Endangered Species Act - 16 U.S.C. 1531 - Restricts activities where endangered species may be present.

- Farmland Protection Policy Act (FPPA) of 1980 and 1995 - 7 U.S.C. 4201 et seq - Instructs the Department of Agriculture, in cooperation with other agencies and other

units of the Federal government, to develop criteria for identifying the effects of Federal programs on the conversion of farmland to nonagricultural uses. It does not provide a basis for any action.

- National Historic Preservation Act - 16 U.S.C. 470 - Requires federal agencies to take into account the effect of any federally-assisted undertaking or licensing on any district, site, building, structure, or object that is included in or is eligible for inclusion in the National Register of Historic Places.

- Rivers and Harbors Act of 1899 - 33 CFR 320-330 - Establishes a Corps of Engineers permit program for dams, dikes, dredging, and other construction in navigable waters of the U.S.

- Fish and Wildlife Coordination Act - 16 U.S.C. 661 40 CFR 2 6:302(g) - Requires consultation with the U.S. Fish and Wildlife Services when a Federal department or agency proposes or authorizes any modification of any stream or other water body, and adequate provision for protection of fish and wildlife resources.

- National Ambient Air Quality Standards (NAAQS) - 40 CFR 50 - Establishes non-attainment zones with respect to health-based criteria.

- Federal Endangered and Non-Game Species Act - N.J.S.A. 23:2A-1 - Standards for the protection of threatened and endangered species.

- Flood Hazard Area Regulations - N.J.A.C. 7:13 - Protects floodplains through permitting requirements for construction and development activities

- Flood Hazard Area Control Act - N.J.S.A. 58: 16A-50 - Delineates flood hazard areas and regulates use.

- Wetland Act of 1970 - N.J.S.A. 13:9A-1 et.seq. - Establishes listing and permitting requirements for regulated activities

- Freshwater Wetlands Protection Act - N.J.S.A. 13:9B - Establishes listings and permitting requirements for regulated activities in state freshwater wetlands

- Open Lands Management - N.J.A.C. 7:2-12.1 et.seq. -

Considers impact of remedial actions on recreational projects funded by Open Lands Management Grants.

- Natural Areas System - N.J.A.C. 7:2-11 - Protects natural area sites listed under the Natural Areas Register.

- State Trails System - N.J.S.A. 13:8-30 et. seq. - Requires that use of trail does not interfere with nature; maintains natural and scenic qualities.

- New Jersey Wild and Scenic Rivers System - N.J.S.A. 13:8-45 et. seq. - Governs component river area, flood hazard area, or part of state park, wildlife refuge or similar area.

- New Jersey's Threatened Plant Species - Lists threatened plant species.

- Endangered Plant/Animal Species Habitats - New Jersey's Endangered Species Act - Lists threatened habitats where endangered species occur.

APPENDIX III

ADMINISTRATIVE RECORD INDEX

POHATCONG VALLEY GROUNDWATER CONTAMINATION SITE
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

1.0 SITE IDENTIFICATION

1.1 Background - RCRA and Other Information

P. 100001 - 100013 - Report: Documentation Records for Hazard Ranking System, Pohatcong Valley Groundwater Contamination, Franklin Township, Washington Township, Washington Boro, Warren County, New Jersey, January, 1983.

P. 100014 - 100016 - Report: Facility Name: Pohatcong Valley Groundwater Contamination, Franklin Township, Washington Township, Washington Boro, Warren County, New Jersey, prepared by Mr. Kenneth J. Kloo, HSMS IV, December 2, 1985.

P. 100017 - 100017 - Notice: Pohatcong Valley Groundwater Contamination, Region 2, Identification Number: NJD981179047, July 31, 1995.

P. 100018 - 100134 - Report: Pohatcong Valley Groundwater Contamination, Franklin Township, Washington Township, Washington Boro, Warren County, New Jersey. Reference A - Base Maps; Reference B - Potable Water Analyses; Reference C - Hydrogeology and Water Supply Data, undated.

1.2 Notification/Site Inspection Reports

P. 100135 - 100148 - Report: Potential Hazardous Waste Site, Site Inspection Report, Pohatcong Valley Groundwater Contamination, Franklin Township, Washington Township, Washington Boro, Warren County, New Jersey, Inspectors: Mr. Paul Muscalo, NJDEP/DWR Geologist, Ms. Isabel Boho, NJDEP/DWR Northern Enforcement, prepared by Mr. Kenneth Kloo, HSMA/SEU, New Jersey Department of Environmental Protection, undated.

1.3 Preliminary Assessment Reports

P. 100149 - 100161 Form: Preliminary Assessment Review Form, Pohatcong Valley Groundwater Contamination, New Jersey Water Company, May 11, 1985. (Attachment: Report: Preliminary Assessment Photo Log, prepared by Malcolm Pirnie, March 12, 1985).

P. 100162 - 100165 Report: Potential Hazardous Waste Site, Preliminary Assessment, Pohatcong Valley Groundwater Contamination, Washington Township, Washington Boro, Franklin Township, Warren County, New Jersey, prepared by Mr. Kenneth J. Kloo, HSMA, New Jersey Department of Environmental Protection, October 25, 1985.

P. 100166 - 100167 Form: Preliminary Assessment Review Form, Pohatcong Valley Groundwater Contamination, Reviewer: Mr. Peter J. Acker, June 3, 1986. (Attachment: Pohatcong Valley Groundwater Contamination/AKA Brass Castle - Broadway/Washington Boro Well Contamination, Franklin Township, Washington Township, Washington Boro, Warren County, New Jersey).

1.4 Site Investigation Reports

P. 100168 - 100175 Report: Pohatcong Valley Groundwater Contamination, Franklin Township, Washington Township, Washington Boro, Warren County, New Jersey, December 2, 1985.

1.6 Correspondence

P. 100176 - 100221 Memorandum to Ms. Isabel Boho, through Mr. Robert Plumb, Assistant Chief, Northern Region Enforcement, DWR, State of New Jersey, Department of Environmental Protection, Division of Water Resources, from Mr. David Muscalo, through Mr. Steven Spayd, Supervisor, Bureau of Ground-Water Pollution Analysis, NJGS, State of New Jersey, Department of Environmental Protection, re: Brass Castle/Broadway Well Contamination, Warren County,- Preliminary Site Evaluation and Recommendations, March 20, 1985.

P. 100222 - 100227 Memorandum to Mr. Sonny Saroya, through Mr. John Preczewski, Section Chief, Bureau of Water Supply, State of New Jersey, Department of Environmental Protection, from Mr. David Muscalo, through Mr. Steven Spayd and Mr. William Althoff, Chief, Bureau of Ground Water Pollution Analysis, State of New Jersey, Department of Environmental Protection, Division of Water Resources, re: Brass Castle/Broadway Well Contamination - Washington/ Franklin Townships - Red-line Area, May 7, 1985.

P. 100228 - 100231 Memorandum to Mr. Kenneth Kloo, Senior Specialist, Bureau of Planning and Assessment, DHWM, State of New Jersey, Department of Environmental Protection, from Mr. David Muscalo, through Mr. Steven Spayd, Section Chief, Bureau of Groundwater Pollution Analysis, New Jersey Geological Survey, State of New Jersey, Department of Environmental Protection, Division of Water Resources, re: Brass Castle/ Broadway Well Contamination, Washington/Franklin Townships, Warren County - Ongoing Contaminant Source Investigation, July 10, 1987.

P. 100232 - 100264 Memorandum (w/attachments) to Mr. Rocky Richards, Section Chief, Bureau of Site Management, New Jersey Department of Environmental Protection, from Mr. Marc Romanell, Supervising Geologist, BGWPA, New Jersey Department of Environmental Protection, Division of Publicly Funded Site Remediation, Bureau of Groundwater Pollution Abatement, re: Pohatcong Valley Groundwater Contamination, Franklin & Washington Townships, Washington Boro, Warren County, Job #: W220BY00, August 21, 1987.

P. 100265 - 100267 Memorandum to Mr. Kenneth Kloo, Senior Specialist, Bureau of Planning and Assessment, DHWM, State of New Jersey, Department of Environmental Protection, from Mr. David Muscalo, through Mr. Steven Spayd, Section Chief, Bureau of Groundwater Pollution Analysis, New Jersey Geological Survey, State of New Jersey, Department of Environmental Protection, Division of Water Resources, re: Brass Castle/ Broadway Well Contamination, Washington/Franklin Townships, Warren County - Justification for Consolidation of Hydrogeologic Investigations in the Well-Restriction Area, September 28, 1987.

P. 100268 - 100282 Memorandum (w/attachments) to Mr. Robert Oberthaler, Bureau of Water Supply, State of New Jersey, Department of Environmental Protection, from Mr. Stuart Messur, Site Manager, Bureau of Site Management, State of New Jersey, Department of Environmental Protection, Division of Hazardous Site Mitigation, re: Highpoint Landfill Potable Well Sampling, August 1, 1988.

P. 100283 - 100284 Letter to Mr. David Hicks, Warren County, from Mr. Steven Nieswand, P.E., Acting Assistant Director, Water Supply Element, State of New Jersey, Department of Environmental Protection, Division of Water Resources, re: Spill Compensations Fund, Brass Castle, August 15, 1988.

P. 100285 - 100307 Letter to Victaulic Company of America, from Mr. Charles Ziegmont, Environmental Specialist, Groundwater Discharge Enforcement, State of New Jersey, Department of Environmental Protection, Division of Water Resources, Northern Bureau of Regional Enforcement, re: Industrial Sampling, NJPDES No. : NJ0099791, Apex Facility, Franklin Township, Warren County, January 10, 1989. (w/cover letter).

3.0 REMEDIAL INVESTIGATION

3.3 Work Plans

P. 300001 - 300033 Report: Pohatcong Valley Superfund Site, Field Operations Plan Tables (Data Quality Objectives for the Pohatcong Valley Sampling Program), March 1999.

P. 300034 - 300187 Report: Pohatcong Valley Groundwater Contamination Site, Statement of Work for EPA Region 6 Response Action Contract, June 1, 1999.

P. 300188 - 300305A Report: Work Plan, Pohatcong Valley Groundwater Contamination Site, Remedial Investigation/ Feasibility Study Volume I of II, Response Action Contract No. 68-W6-0036, EPA Work Assignment No. 037-RICO-023J, CH2M HILL Project No. 153634 DCN 99-1307, prepared by CH2M HILL, Inc., prepared for U.S. EPA, Region 2, August 23, 1999.

P. 300306 - 300859 Report: Field Operations Plan, Pohatcong Valley Groundwater Contamination Site, Remedial Investigation/Feasibility Study, Response Action Contract No. 68-W6-0036, EPA Work Assignment No. 037-RICO-023, CH2M HILL Project No. 153634, prepared by CH2M HILL, prepared for U.S. EPA, Region 2, December, 1999.

P. 300860 - 300941 Report: Pohatcong Valley Groundwater Contamination Site, Addendum to the December 1999 Field Operation Plan, prepared by CH2M HILL, prepared for U.S. EPA, Region 2 (w/transmittal memo), June, 2001.

P. 300942 - 300994 Report: CH2M HILL Health and Safety Plan (Reference CH2M HILL SOP HS-19, Site-Specific Written Safety Plans), Project No: 164440, Pohatcong Valley Groundwater Contamination Site, prepared by CH2M HILL, prepared for U.S. EPA, Region 2, May 13, 2003.

3.4 Remedial Investigation Reports

P. 300995 - 300995 Compact Disk: Final OU1 Remedial Investigation Report, Pohatcong Valley Groundwater Contamination Site, prepared by CH2MHill, prepared for U.S. EPA, Region 2, June 2005.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400001 Compact Disk: Final OU1 Feasibility Study Report, Pohatcong Valley Groundwater Contamination Site, prepared by CH2MHill, prepared for U.S. EPA, Region 2, June 2005.

7.0 ENFORCEMENT

7.7 Notice Letters and Responses - 104e's

P. 700001- 700003 Letter to Ms. Ilene Gordon, President, Pechiney Plastic Packaging, Inc., from Mr. George Pavlou, Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, re: General Notice Letter for the Pohatcong Valley Groundwater Contamination Site in Warren County, New Jersey, June 8, 2004.

P. 700004 - 700006 Letter to Kedari Reddy, Office of Regional Counsel, New Jersey Superfund Branch, U.S. EPA, Region 2, from Barbara Magel, Karaganis, White & Magel, Ltd., re: Response to General Notice Letter - Pohatcong Valley Groundwater Contamination Site, June 30, 2004.

P. 700007 - 700009 Letter to L&L Drycleaners from Mr. George Pavlou, Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, re: General Notice Letter for the Pohatcong Valley Groundwater Contamination Site, Warren County, New Jersey, August 3, 2004.

P. 700010 - 700012 Letter to Mr. George Koorie, Modern Valet Service, from Mr. George Pavlou, Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, re: General Notice Letter for the Pohatcong Valley Groundwater Contamination Site, Warren County, New Jersey, August 3, 2004.

7.8 Correspondence

P. 700013 - 700016 Memorandum (with attachment) to Pohatcong Valley Groundwater Contamination Superfund Site Administrative Record from Kedari Reddy, Assistant Regional Counsel, U.S. EPA, Region 2, re: Availability of Documents, April 27, 2005.

8.0 HEALTH ASSESSMENTS

8.1 ATSDR Health Assessments

P. 800001 - 800009 Report: Health Assessment, Pohatcong Valley Groundwater Contamination, Warren County, New Jersey, prepared by Environmental Health Service, New Jersey Department of Health (NJDOH) and Division of Science and Research, New Jersey Department of Environmental Protection (NJDEP), prepared for Agency for Toxic Substances and Disease Registry (ATSDR), undated.

10.0 PUBLIC PARTICIPATION

10.2 Community Relations Plans

P. 10.00001-10.00049 Report: Final Revised Community Relations Plan for the Pohatcong Valley Superfund Site, Warren County, New Jersey, EPA ARCS II Contract No. 68-W8-0124, EPA Work Assignment No. 003-2L3J, prepared by ICF Kaiser Engineers, Inc., prepared for U.S. EPA, Region 2, April 1998.

10.9 Proposed Plan

P. 10.00050-10.00067 Superfund Program Proposed Plan, Pohatcong Valley Groundwater Contamination Site, Operable Unit 1 Study Area, prepared by U.S. EPA, Region 2, July 2005.

APPENDIX IV

STATE CONCURRENCE LETTER

State of New Jersey
Department of Environmental Protection

Richard J. Codey
Acting Governor

Bradley M. Campt
Commissioner

Steinberg
Callahan
Gerco
cc Paulon

Honorable Alan J. Steinberg, Regional Administrator
United States Environmental Protection Agency Region II
290 Broadway
New York, NY 10007-1866

SEP 30 2005

Peterson

RE: Record of Decision (ROD) Operable Unit #1
Pohatcong Valley Groundwater Contamination Site
Washington Township, Washington Boro,
Franklin Township, Warren County, NJ

Dear Mr. Steinberg:

The New Jersey Department of Environmental Protection (Department) has completed review of the September 2005 Draft Record of Decision (ROD) for the Pohatcong Valley Groundwater Contamination Site Operable Unit #1 (OU1) submitted by the United States Environmental Protection Agency (EPA). The OU1 ROD addresses soil and groundwater contamination at the site. The Department concurs with EPA's chosen groundwater remedy, while it further evaluates the soil remedy.

The selected groundwater remedy for OU1 is Alternative GW2 (Source Treatment and Natural Attenuation). Alternative GW2 is comprised of the following components:

- Pumping and treatment of the most contaminated portions of the TCE and PCE groundwater plumes using a series of extraction wells near the downgradient edge of the source areas. For TCE, groundwater levels at approximately 500 pbb and above will be extracted and treated;

- Treatment of extracted water to meet the New Jersey Groundwater Quality Standard (NJ GWQS) of 1 part per billion (ppb) for TCE and PCE using air stripping (transferring TCE and PCE from liquid to vapor phase) prior to reinjection into the regional aquifer; and

- Long-term monitoring of natural attenuation in the downgradient portions of the TCE and PCE plumes to determine whether these contaminants are meeting the New Jersey Groundwater Quality Standard (NJ GWQS) of 1 ppb.

- Institutional controls, such as the implementation of a Classification Exception Area to restrict the use of groundwater within the area until the aquifer is restored.

500096

The EPA agrees that it will coordinate remedial efforts with NJDEP's ISRA program, which currently oversees a separate responsible party remedial investigation/cleanup with American National Can (ANC).

The Department appreciates the opportunity to participate in the remedial decision making process and the efforts of the EPA to address this contaminated site.

If you have any questions, please do not hesitate to call me at (609) 292-1250.

Sincerely,

Joseph J. Seebode, Assistant Commissioner
Site Remediation & Waste Management Program

cc: Thomas Cozzi, NJDEP Director
Edward Putnam, NJDEP Assistant Director
Bruce Venner, NJDEP Bureau Chief
Kenneth Petrone, NJDEP Section Chief
Luis Sanders, NJDEP Site Manager
Chris Blake, NJDEP Case Manager
Carey Compton, NJDEP Technical Coordinator
David Kaplan, NJDEP Geologist

APPENDIX V

RESPONSIVENESS SUMMARY
POHATCONG VALLEY GROUNDWATER CONTAMINATION
SUPERFUND, INC. SITE
OPERABLE UNIT ONE

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Plan for the Pohatcong Valley Groundwater Contamination Superfund Site (Site), and the EPA's responses to those comments. At the time of the public comment period, EPA proposed preferred alternatives for groundwater and source areas soil contamination. These comments were provided in oral form during the August 4, 2005 Public Meeting and in written form during the Public Comment Period of July 27, 2005 to September 26, 2005. The oral comments and written comments and associated responses are presented below.

Public Meeting and Comments

A Public Meeting was held on August 4, 2005 in the Warren County Vocational Technical School auditorium.

The attendance list is provided in Attachment 1. The meeting consisted of a brief presentation of the Pohatcong Valley Remedial Investigation (RI) findings, the Feasibility Study (FS) results, and the proposed selected remedial alternative in the Proposed Plan, followed by an open question and answer period. Several people in the audience provided oral comments and questions and these comments and associated responses were summarized and organized into major categories to facilitate presentation in this written format. The comments are provided below.

EPA held a public comment period to solicit community input in the remedy selection process. EPA's Proposed Plan for OU1 was released to the public on July 27, 2005. A copy of the Proposed Plan was placed in the Administrative Record and was made available in the information repository at the Warren County Health Department offices, Washington Borough, Warren County, New Jersey. A public notice was published in the Express Times, advising the public of the availability of the Proposed Plan. The notice also announced the opening of a public comment period and invited all interested parties to attend an upcoming public meeting. The public comment period extended from July 27, 2005 to September 26, 2005. The oral comments and written comments received by EPA and associated responses are presented below.

Upon review of these comments, it was determined that a significant change to the remedy, as it was originally identified in the Proposed Plan, was appropriate. The Proposed Plan described EPA's preferred remedies for addressing the remediation of TCE and PCE-contaminated groundwater, as well as TCE contaminated soils at the Site. After considering all comments

received, EPA has decided to conduct a supplemental soils investigation to further define the extent of the TCE soil contaminated in the soil source area instead of conducting additional soils investigation during the remedial design phase as originally contemplated in the Proposed Plan. Therefore, the Selected Remedy described in this document addresses only the remediation of TCE and PCE-contaminated groundwater within the OUI Study Area. A remedy addressing contaminated soils in the OU1 Area will be issued after the supplemental soils investigation has been completed.

This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS: This section provides the history of community involvement and interests regarding the Pohatcong Valley Groundwater Contamination Superfund Site.

II. PUBLIC MEETING OVERVIEW: This section briefly describes the public meeting held on August 4, 2005 and includes historical information about the Pohatcong Valley Groundwater Contamination Superfund Site;

III. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS, AND RESPONSES: This section describes written and verbal comments received from various people or organizations during the public comment period, and provides EPA's responses.

ATTACHMENT C contains the public meeting sign-in sheet.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The level of community involvement and concern with the Site has been high. Local officials and residents first learned of contamination that later became known as the Pohatcong Valley Groundwater Contamination Superfund Site in the late 1970's when two public water supply wells became contaminated with TCE and PCE, and the State and Warren County Health Department became involved, investigating the extent of the groundwater contamination. The State and local health officials continued studying the site, and recommended that it be place on the National Priorities List (NPL) in 1989. After subsequent investigations, the State installed public water supply connections throughout parts of Washington and Franklin Township.

The Site was included on the NPL on March 30, 1989. Since then, EPA has conducted an extensive Remedial Investigation and Feasibility study that were completed in 2005, and at the same time conducted an community relations program to meet the community's need for information and to support community participation in seeking remedies for the Site. Since 1990, EPA has held several public meetings and public availability sessions, and met with local officials regarding various Site related matters, in an effort to keep residents and local officials informed of

the site-related activities. In addition to the public participation responsibilities associated with the OU1 remedy, EPA continues to have regular communications with various officials regarding the Site. Several of the identified soils source areas are within Washington Borough's downtown area, and have been the effort of the Borough's efforts to develop and revitalize its downtown. As a result, in 2005 and 2006, EPA has meet with township officials and a potential developer to expeditiously and efficiently handle these diverse matters, to assure that future development will not have a negative impact on planned cleanup activities at the Site. To this day, community interest in the cleanup of the Site remains high and EPA remains responsive to addressing issues and concerns raised by local officials and the community.

II. PUBLIC MEETING OVERVIEW

The public meeting for the Pohatcong Valley Groundwater Contamination Superfund Site began at approximately 7:00 p.m. on August 4, 2005 with presentations by EPA, and its contractor, CH2MHill Corporation. Approximately 50 residents and local officials attended the meeting. The Attendance Sheet is Attachment E.

EPA representatives at the meeting were Kim O'Connell, Section Chief; Stephen Cipot, Remedial Project Manager, for the Site; Charles Nace, Risk Assessor, Robert Alvey, Hydrologist, and Pat Seppi, Community Relations Coordinator, and CH2MHill Corporation representative Murray Rosenberg, Project Manager.

Ms. Seppi introduced each of the speakers and explained that the purpose of the meeting was to present EPA's Proposed Plan for the cleanup of contaminated soil and groundwater at the Site. Ms. Seppi presented a brief overview of how the Superfund process works. She described how a site may be placed onto the National Priorities List and how a remedy is selected. She indicated that sites such as Pohatcong Valley Groundwater Contamination Superfund Site are often complex and are frequently addressed in stages called operable units. Studies conducted to characterize contamination and evaluate the risks to human health and the environment are reported in the RI and the results of studies to identify and evaluate remedial alternatives to address the site contamination are reported in the FS. Once the FS is completed, EPA develops a Proposed Plan and presents EPA's preferred cleanup alternative to the public.

Ms. Seppi explained that the community's concerns would be factored into EPA's ROD for the Site. Ms. Seppi informed the audience that EPA would accept comments throughout the remainder of the public comment period. Ms. Seppi also informed the group that the RI and FS Reports and other site-related documents are available for public review at the local information repositories listed in the Proposed Plan. Copies of the Proposed Plan were available for the taking at the meeting. Ms. Seppi went on to say that public participation is an important element of the Superfund process. EPA provides the public an opportunity to comment on the results of the studies and the proposed remedy. After considering public comments, EPA will document the selected cleanup alternative in the ROD. Once the ROD is final, the remedial design process

begins where the specifications and plans for the selected remedy are developed. Remedial action is initiated after the design is completed and is the stage where construction and cleanup activity occur at a site. Ms. Seppi then introduced Mr. Cipot.

Mr. Cipot presented an update of the status of activities that EPA has been involved with at the Site. He announced that EPA can move forward with the Site remediation of the soil and groundwater, once the ROD has been issued. Mr. Cipot. summarized the results of the June 2005 Remedial Investigation Report (RI), the June 2005 Feasibility Study Report (FS), and the August 2005 Proposed Plan for remedial action for soil and groundwater. Mr. Cipot then discussed the risks posed by these findings, as described in the RI. Mr. Cipot explained that once EPA set the objectives for cleanup of the Site, the FS studied various alternatives to determine which may be successfully implemented. Mr. Cipot described the Remedial Alternatives for each media, soil and groundwater, and the Preferred Alternatives for each. EPA compared a number of alternatives including a No Action Alternative (required in all Superfund Feasibility Studies). Each alternative is summarized in the Proposed Plan along with the rationale EPA developed for selection of a preferred alternative for the various media.

Ms. Seppi then invited the stakeholders present at the meeting to offer comments and ask questions. EPA and its contractor, CH2MHill, responded to questions and comments.

III. **COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS, AND RESPONSES**: This section describes written and verbal comments received from various people or organizations during the public comment period and are summarized below.

Comments Received at the Public Meeting

Issues and comments raised during the public comment period regarding the fourth ROD for the Site are summarized below and are organized into the following categories:

Land Development
Funding Issues
Water Supply in Designated Critical Area for the NJ Highlands
Health and Safety-related Issues
Legal Issues
Technical and Other Questions
Written and Other Comments Received During the Public Comment Period

Land Development

Comment #1 (Consisting of individual comments from several audience members) - There are

significant pressures to develop open land downgradient from the OU1 Study Areas. How would future land development impact the cleanup process or the plume migration? Would future land development hinder the cleanup process? Would the construction of additional developments, sewage treatment plants, etc; enhance plume migration into the OU2 area? Are groundwater models going to be used to assess the effect of future development? Are local municipalities required to contact EPA to discuss future land use?

EPA Response - Generally, matters pertaining to local land development are under the jurisdiction of local government and the state. EPA can provide local governments and officials with information that may be useful for planning purposes. Currently, it is not anticipated that land development downgradient from the OU1 Study Area would effect the proposed OU1 cleanup. EPA recommends that local communities and governments contact us to discuss the potential impacts of land development, especially in the event that there are any large scale projects planned that may require large withdrawals of water from the regional aquifer. EPA is developing a computer model in conjunction with the USGS. This model may be used to predict the effects of various groundwater withdrawals from the aquifer. Future land use and development may be an issue for the OU2 remedy, however, and the OU2 remedy has not yet been selected. An OU2 RI/FS to determine the full nature and extent of contamination in the OU2 Study Area has just been initiated and is in the work plan phase. After the OU2 study is complete, future land use and development in the OU2 area can be considered when EPA evaluates the feasibility of various OU2 remedial options.

Larry D'Andrea, a local resident as well as a USEPA employee in the Brownfields Program, attended the public meeting and pointed out that EPA has initiated communication with local governments in the vicinity of the Site regarding land use issues. Continued integration efforts between the EPA and the community will allow the community to plan for the appropriate land use development, while considering EPA's planned cleanup activities.

Comment #2 - Does EPA provide information about land use restrictions and limit the amount of water that can be extracted from the aquifer due to groundwater contamination? For example, if a development is going to include a large area having up to eight homes per acre, how many acres of development would it take to have an impact on the polluted groundwater area?

EPA Response - EPA generally does not restrict land use and limit the amount of water that can be produced; however, the example illustrated above is not expected to have an adverse impact on the remedy. There is a lot of water moving through the aquifer in the vicinity of the Site, and there would have to be thousands of new homes on private wells, in order to have a noticeable effect on the aquifer. In addition, it should be noted that new public water supply wells are required by State and Federal law to meet drinking water standards.

Comment #3 - Would future land development in the OU2 Study Area, including installation of additional water supply wells, enhance the migration of the contaminant plume toward the developed areas. If so, would it not be a good idea to make a moratorium on building in that area

until this project is underway?

EPA Response - If additional water supply wells are installed in the OU2 Study Area, their operation is not anticipated to affect the OU1 remedial system pumping. The system will not be pumping that much water compared to the amount of water in the aquifer system. Furthermore, the distance between the OU1 treatment system and the OU2 area is large. EPA would assist local official in making land development decisions by communicating our findings with them.

Comment #4 - Are there plans to require the testing of newly installed water wells for parameters such as Perchloroethene (PCE) and trichloroethene (TCE)?

EPA Response - *The State of New Jersey has the responsibility of requiring the testing of water supply wells. EPA will refer your question to the appropriate NJDEP officials.*

Funding Issues

Comment #1 - Is the implementation of the planned cleanup contingent upon private industry funding it, or could the EPA proceed without private funding?

EPA Response - The implementation of the remedy is not contingent on private industry funding. EPA will contact the potentially responsible parties and give them an opportunity to negotiate a legal agreement by which they would implement the remedy. EPA also has the option of performing the cleanup through the use of federal funding.

Comment #2 (Consisting of individual comments from several audience members) - What law does the EPA have to help leverage the responsible companies to shoulder the cost of remediation? If the finances from the responsible parties fall short, are public funds available? Does the NPL ranking affect the ability to secure public funds? Where would the Pohatcong site rank in terms of public impact?

EPA Response - The Superfund law provides EPA with specific enforcement authorities and gives the EPA the ability to pursue the responsible parties for cleanups, as appropriate. For the Pohatcong OU1 Study Area, EPA has named three companies as potentially responsible parties. These parties were identified and named as potentially responsible parties during the remedial investigation. After the Record of Decision is issued, EPA will provide these parties with an opportunity to enter into negotiations regarding the implementation of the selected remedy. If negotiations are unsuccessful, EPA has other options for implementing the remedy, including the use of federal funds. The preference is for the responsible parties do the cleanup, as opposed to using limited public dollars. If there are not enough federal funds available to clean up sites that are ready to be cleaned up, the sites are ranked and available funds are allocated based on the ranking. This ranking is based on the potential health risk to humans and is different than the NPL ranking, which does not change. The remedy for the Pohatcong Valley site has not been ranked at

this time, as EPA expects to proceed with negotiations immediately after issuance of the Record of Decision.

Comment #3 - During negotiations with the responsible companies, does EPA consider the cost of the remedy? Are there negotiations with the people that pollute while EPA is trying to clean the site up, and does the EPA consider what remedy a company is likely to contribute to in the selection of a remedy?

EPA Response - The cost of the remedy is one of the factors EPA considers when the EPA selects the remedy. However, remedy selection is based on nine criteria, and anticipating what remedy a company may be likely to perform is not something EPA considers. EPA does not negotiate with any party prior to selecting a remedy. A remedy is selected through a well defined process that includes a public comment period. All comments received during the public comment period, including all comments received by potentially responsible parties, are considered by EPA prior to remedy selection. After the remedy is selected we expect to enter into negotiations with potentially responsible parties. The results of such negotiations may be finalized in an enforcement agreement that would set the terms by which the parties implement the remedy.

Comment #4 - Has the responsible company or its consultant reached out to the EPA to discuss the cost of the remedy? Does the EPA know who the responsible companies and their consultants are?

EPA Response - EPA named three companies as potentially responsible parties during the remedial investigation. These parties are Pechiney Plastic Packaging, Inc. (PPPI), L&L Econowash Cleaners and Modern Valet Services. One of the identified parties, PPPI, is currently performing environmental studies and has performed some cleanup work at the American Can facility under the direction of the State of New Jersey. EPA has met with representatives of PPPI and their consultant, Environ, to discuss some items related to the remedial investigation, but we have not discussed the cost or any other element of the remedy.

Comment #5 - The present worth cost for the preferred groundwater alternative (GW3) is $25,765,000. How is that cost distributed over time? Is it spread out over one and a half years or the forty seven years estimated for the cleanup to be achieved?

EPA Response - The cost is spread out over 30 years.

Comment #6 - Is the cost spread out evenly, similar to borrowing money for a mortgage, so that it will be less than a million dollars a year for 30 years?

EPA Response - The calculation of the present-worth cost for the project is similar to borrowing money for a mortgage; however, there are up-front costs to construct the system and the rest is mainly for Operation and Maintenance (O&M). The O&M costs are approximately one million dollars a year, and are included in the total cost estimate.

Comment #7 - How much did this study cost to do?

EPA Response - It has cost approximately 12 million dollars to conduct the RI/FS for the OU1 Study Area.

Water Supply in Designated Critical Area for the NJ Highlands

Comment #1 - The Pohatcong Valley area has been nationally designated as a critical water supply area to the NJ Highlands. Given this designation, why was the alternative that remediates the area in the shortest time not selected as the preferred alternative? What was the decision process and was the critical nature of this area for the NJ Highlands considered?

EPA Response - The groundwater alternative with the shortest remedial time to achieve cleanup goals is GW4, which provides for the treatment of the entire groundwater contaminant plume using six sets of five extraction wells laid out across the OU1 Study Area, for a total of 30 wells. Upon detailed evaluation, several drawbacks to this alternative became apparent. First, the installed remedial system would be very large and take up a significant amount of space. Secondly, when EPA considered pumping and treating the whole plume, a number of problems were identified, such as the potential for dewatering surface water bodies and streams. The system would have to withdraw about 13 million gallons per day from the aquifer, which would have a significant negative impact on this aquifer in the NJ Highlands area, the surface water bodies, and the potable wells in the area based on the computer modeling. Third, the GW4 alternative would not satisfy some important criteria, the first 7 of the NCP Criteria, as defined in FS Table 5-2 (Page 123).

Lastly, the significant cost of the alternative, at $46,840,000, is considered a drawback when compared to cost and time-of-restoration of the other alternatives, especially the preferred alternative. The preferred remedy was considered to be the most efficient way of remediating the groundwater by focusing on the highest areas of contamination, and restoring the aquifer in a reasonable time frame compared to other alternatives, for a comparatively reasonable cost of approximately 8 million dollars.

Please note that the estimated time-of-restoration values for the four alternatives developed and analyzed were estimates based on modeling so we can predict how long a cleanup might take in a comparative sense. Modeling is not an exact science. When systems are up and running for a number of years, the EPA will have a better idea of what the time-of-restoration might be. Time-of-restoration estimates were developed to allow us to compare and contrast different alternatives during the evaluation process, but these are approximate, not exact. What is clear from the evaluation is that for a plume of this size, the time to restore the aquifer to meet drinking water standards will take decades for any alternative.

Comment #2 - The State has mandated the development of a regional development plan for this area, and this includes the Highlands Preservation area. A lot of development is proposed to come

from the surrounding preservation areas into the Pohatcong Valley because there will be no other place for it to go. Should the Highlands council be contacting the EPA to put the identified plans for growth into the cleanup plan? Should the different agencies come on board with what is going into the master plan for the preservation area? Does the EPA put limits on how much the raw land can be developed and if this development will have an impact on the groundwater contamination and remediation activities in this area?

EPA Response - The EPA can provide information from the remedial investigation and feasibility study process, and how we are planning to address and remediate the Site. The State of New Jersey is aware of all the Superfund activities which have taken place to date. All data EPA has collected at the Site has been made available to the public and to local officials and may be used by local officials to help decide how to handle development issues, in conjunction with the State, if appropriate. EPA expects to coordinate all future cleanup actions with State and local authorities, to assure that all State and local requirements are met during remedial activities. EPA anticipates that State and local authorities will take all relevant information collected during cleanup and use that appropriately in making decisions about local development. EPA hopes to meet with appropriate local or State officials during the cleanup process and work closely with these officials during the cleanup process to assure that potential development does not have any negative impact on cleanup activities.

Health and Safety-related Issues

Comment #1 (Consisting of individual comments from several audience members) - It was stated in the presentation that the contamination was believed to have started in 1950s and 1960s, and the public water system located downgradient from Washington Borough was installed in 1989. That suggests that there was potentially 30 years where people were drinking contaminated water. Would this situation warrant any additional epidemiological study of people who lived in that region during that period of time? Has there been any study or survey or even questionnaires sent out? Has anybody become ill? Are there any identified cancer clusters in the area?

EPA Response - The Superfund Program is concerned about people's health; however, EPA does not do epidemiological studies or send out health surveys of this type. The State of New Jersey Department of Health and Senior Services has responsibility for conducting cancer studies. The State collects cancer data through a cancer registry and it evaluates and looks at the cancer reports to evaluate if there are elevated rates in any particular area. EPA understands that the State examines the data on a regular basis. The EPA is unaware of a report identifying a cancer cluster in this area. EPA is not aware of any specific surveys sent out to the residents.

Comment #2 (Consisting of individual comments from several audience members) - In regards to the historical contamination, have precautions been taken over the years to assure the safety of the workers at the American National Can facility? If there is extensive contamination underneath the building at that facility, there is a potential for that to be a source of contamination into that

building. In addition, the facility's drainage system may be a source of contamination. Anecdotal information indicates that there was dumping of barrels of contaminants in the river. There is a concern that the past and present workers at the American National Can have been or are being subjected to excessive levels of contamination without knowing it.

EPA Response - The American National Can facility is currently an operating facility and the Occupational Safety and Health Administration is responsible for regulating safety issues at industrial facilities. Past and present workers can follow up with OSHA to determine if worker protection requirements have or have not been met over time. If individuals have any information about past disposal practices at the facility, they should contact EPA's project manager for the Pohatcong Valley Superfund site. EPA will follow up on any pertinent information it receives.

Legal Issues

Comment #1 - Does EPA or the federal government mandate disclosure to potential home buyers that are buying property in Pohatcong Valley regarding the Superfund Site? If so, who is supposed to police their compliance?

EPA Response - There is no federal law that requires homeowners to be notified of Superfund sites in the area, but there is a NJ state law for such a notification that realtors must comply with.

Comment #2 - Do you feel that a homeowner would have legal recourse against a realtor for not being notified of the existence of the Superfund Site?

EPA Response - You will have to consult with an attorney on that question.

Comment #3 - The State of New Jersey has a Damage to Natural Resources Program where they assess the polluters for the damage they've done. Do you know what damage has been done to this aquifer? What is the volume of water contaminated?

EPA Response - Natural Resource Damages have not been assessed at this point by the State or federal government. Estimates of the volume of water contaminated have not been calculated.

Areas Downgradient from OU1 Study Area

Comment #1 - From the presentation, it looks like the downgradient edge of the TCE plume is going into Greenwich Township. Is there a potential that the TCE plume will continue to migrate into Greenwich Township under this Proposed Plan? What is EPA doing to address this concern of residents in Greenwich Township?

EPA Response - The EPA has initiated investigations for the OU2 Study Area of the Site which

includes the area of impacted groundwater in the area of Greenwich Township. At this point it is possible that the plume from the OU1 Study Area is traveling downgradient, but EPA has not, at this time, established if the two study areas, OU1 and OU2, are connected or not. There is a large area in the middle of the two study areas where EPA does not have any groundwater data. There are a number of potential source areas in the OU2 Study area that will need to be investigated in the OU2 Study before any connection between OU1 and OU2 can be established. The proposed plan will treat the most contaminated portion of the groundwater plume, located in Washington Township and cut off this source area from making continued contributions to groundwater and to downgradient areas. In addition, EPA has initiated OU2 remedial investigation activities to determine the nature and extent of contamination in a number of areas including Greenwich Township, so an appropriate remedy can be selected to address those areas.

Comment #2 - Are there public water supplies in the OU2 Study Area that are impacted?

EPA Response - In the OU2 Study Area, there are no public water supply wells such as the Dale Avenue and Vannatta Street wells, which are located in the OU1 area. Everyone in the OU2 Study Area is supplied by a private well. The sampling conducted on some of the residential wells in the OU2 Study Area by the Warren County Department of Health and the NJDEP indicate that there are levels of TCE present in some of the wells at levels above the NJDEP groundwater standard of 1 part billion. For these impacted residential wells, the State of New Jersey has been installing portable treatment units.

Comment #3 - If the wells in the OU1 Study Area are capped and residents of that area are on public water, why is public water not available in the areas downgradient from the OU1 Study Area?

EPA Response - In general, the State and local authorities are responsible for planning related to the extending of public water lines. In the OU1 Study Area, a public water supply line was extended by the State up to a location estimated to be the limits of contamination at the time. This location was later determined to be the downgradient edge of the OU1 Study Area based on EPA's remedial investigation.

Comment #4 - For the OU2 Study Area, how long will it be until you know where the contamination is coming from and how to clean it up, and how will we be notified about it? Is the time it takes to do the study dependent on available funding?

EPA Response - The time frame will likely be several years. The phase of work being planned now is a remedial investigation and feasibility study, which is a long-term study. EPA hopes to collect data in the field later this year and into next year. EPA is currently completing a workplan for the first part of the OU2 study. The workplan will provide the details for the collection and analysis of data. It may be a few years before EPA gets to the point where it is ready to select a remedy. There are several ways the EPA can communicate with the community more frequently throughout the study. The EPA has a mailing list through which it provides periodic updates on

the status of activities to the community. Perhaps another public meeting will be held at the end of the first phase of fieldwork, and EPA can put out a fact sheet to the interested community. The public is encouraged to contact EPA's Remedial Project Manager any time for an update on the work status.

Technical and Other Questions

Comment #1 - Can you provide an explanation of why there is a suspected third site in the TCE source area called ANC-C?

EPA Response - First, there were a significant number of TCE detections in soil samples on the former ANC property, both in the historical data and in the EPA's RI findings. Also, there are perched layers of groundwater containing TCE at concentrations of 120 ppb at a depth of about 30 feet, and of 170 ppb at a depth of 70 feet, both of which are located above the regional aquifer. Because the perched aquifers do not extend laterally for any great distance, these TCE detections originated from a local source which EPA believes is at the ANC facility.

Second, historical engineering drawings of the ANC facility indicate that there were a number of different types of drains, including floor drains throughout the facility in the 1960s, and that there were different types of machines that EPA believes were in operation that might have used TCE at the time. We think most of the contamination occurred in the 1950s through the 1970s. The operations at the facility had changed in nature substantially by the end of the 1970s and 1980s. EPA sampled a number of surface water points with water actually flowing out of them during the RI, that appeared to be coming from the ANC facility, that are perhaps linked to building drains or rain water drains. Water from one active outfall pipe contained TCE at a concentration of 10 parts per billion. This is contamination that EPA believes is residual and is still in the system, and that drain water or storm water was picking up the TCE that was already present; it is not from current operations because the company has not reportedly used TCE in its processes for a long time. A subsequent sample from the same outfall location had TCE at 20 parts per billion in water that was flowing out of it after a rain event.

Lastly, the nature of the TCE plume was considered. The TCE concentrations in the groundwater plume were relatively constant (steady-state conditions) during the RI activities, which indicates that there is an on-going soil source of TCE that is feeding or leaching into the groundwater. If this source were not present, TCE plume levels would have been decreasing over time similar to the observed decrease in the PCE plume, and that has not been observed. EPA also based this on engineering estimates of the approximate amount of TCE currently in the plume and estimated the amount of TCE needed yearly to feed the plume in order to maintain the observed steady-state conditions. EPA also estimated the mass of TCE that had been detected in the soil sources found during the RI. Based on these engineering estimates, the TCE plume contains approximately 8,000 pounds of TCE. The amount of TCE in the soil that is needed to leach into the groundwater each year to maintain this plume is approximately 310 pounds, and the total amount of TCE

estimated at the ANC A and ANC B soil source areas is less than 1,600 pounds. Therefore, with 310 pounds estimated to be leaching into the groundwater each year to create steady-state, the source areas would be exhausted in several years which has not occurred., EPA would expect more TCE in source areas than has been defined and estimated. Therefore EPA does not believe that the currently identified soil sources are the only source areas and an additional soil source area were calling the suspected ANC C area, is located at or near the ANC facility. [Note: There have been additional developments since EPA held the public meeting. NJDEP required PPPI to conduct sampling in the ANC C area. The preliminary results from this sampling confirmed the presence of TCE contamination well above NJ IGWSCC (as high as 190 ppm) in both shallow and deep soil samples in a boring advanced to groundwater. These findings support EPA's conclusion that this facility is a source of TCE groundwater contamination at the Site. EPA will investigate this area further during a supplemental soils investigation.]

Comment #2 - The EPA has been working on this project for several years and the public is just getting the synopsis tonight. I'm respectfully asking for an extension to the comment period since many people really haven't had a chance to digest this or are away on vacations.

EPA Response - EPA will consider extending the public comment period for 30 days to accommodate the request. If EPA does, it will place a notice in the newspaper to that effect.

Comment #3 - Based on tonight's presentation, the Dale Avenue and Vannatta Street water supplies are affected by the groundwater contamination. Are there any other water supplies in the Operable Unit 1 Study Area that are impacted?

EPA Response - No other public water supply wells other than the Dale Avenue and Vannatta Street wells are impacted by groundwater contamination in the OU1 Study Area.

Comment #4 - As the public supply wells are still being used, is the removal of water from the aquifer under the proposed plan going to dry up or affect the public supply wells?

EPA Response -EPA does not expect the preferred alternative to interfere with the water withdrawals of public water supply wells. Alternative GW4, which calls for the extraction of the entire plume, involving the pumping of more than 13 million gallons per day from the aquifer, would potentially have a negative impact on public supply wells, which is one reason why the EPA has not recommended GW4. Computer modeling of the aquifer was done to look at the hydraulic effects of various pumping scenarios to come up with an efficient number of pumping wells and pumping rates. Also, the preferred alternative relies on pumping and treating the contaminated groundwater and re-injecting the treated water back into the aquifer to improve the water quality and to maintain the groundwater resource.

Comment #5 - With regard to the groundwater analysis you performed which included a suite of 136 tests including VOCs, SVOCs and metals, did you find any other contaminants of concern?

EPA Response - At a number of investigated facilities, EPA found potential contamination other than TCE and PCE, which are the main contaminants of concern. The additional compounds include metals, SVOCs and VOCs. TCE and PCE are the contaminants that are included in the widespread groundwater contamination at the site and are the contaminants which will be addressed in the OU1 remedy. All detected contaminants, along with comparisons to regulatory standards, are highlighted in the Remedial Investigation report, and EPA has provided these data to the NJDEP for further assessment.

Comment #6 - With the contaminants in the groundwater, is there a potential that vapors are seeping through the ground into basements and then are being inhaled?

EPA Response - Yes, there is a potential for the inhalation of vapors from "Vapor Intrusion" of volatile contaminants. The concept of vapor intrusion is that volatile contaminants, such as TCE, which are dissolved in the groundwater plume, may enter into a gaseous or vapor phase and migrate vertically up through the soil and reach the ground surface. If a house is over the groundwater plume, these vapors could potentially enter a basement.

The science of dealing with vapor intrusion from a regulatory standpoint is new and it was only identified by EPA as a potential concern at the end the OU1 remedial investigation in late 2003. The regulatory community have been adopting and updating guidelines of how to conduct vapor intrusion investigations.

One of the methods to evaluate the potential of vapor intrusion into buildings is to use a screening criteria that considers the maximum contaminant concentration in the groundwater plume and then collecting data in the field where plume concentrations exceed the trigger criteria to see if there are any vapors actually being generated that might be a health concern. It was decided that it is in the best interests of public health to collect vapor samples beneath residential basements to better define the potential issues. Therefore, during upcoming OU2 work, a vapor intrusion study will be conducted in both the OU1 and OU2 Study Areas to better evaluate potential risk due to inhalation. EPA is planning to focus on three areas, Washington Borough, the Franklin Township/Washington Township border, and the Edison Quarry area, looking at two to three houses in each area. The study for each house would go into basements, drill through the floor and take air samples below the basement floor to see if there is any vapor collecting underneath. The results will help EPA determine if volatile compounds are present.

Comment #7 - I have noticed that there was a gentleman here from Washington Borough. Were all the affected townships notified about this meeting, because it seems strange that their representatives are not here?

EPA Response - The EPA provided notification through a comprehensive mailing and posted a half-page notice in the local Express-Times newspaper. Members of the Warren County Environmental Commission also sent an e-mail notification about this meeting.

OTHER WRITTEN AND VERBAL COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD

Written and verbal comments were received from various people or organizations during the public comment period and are summarized below, followed by EPA's responses.

Comment # 1 - The following verbal comment was received via telephone on August 23: There are reports from various sources that other wells may be open and in use in the OU1 area, in addition to residential wells. The health department is aware of at least one farm well, and possible irrigation wells; will these additional wells be included in the OU1 remedy, and if so how will they be handled?

EPA Response: It is acknowledged that there may be some wells open and in use in the OU1 Study Area. If, during implementation of the remedy, residences or businesses within the aerial extent of the OU1 plume are found to have not yet been connected to public water, EPA would consider connecting them, and sealing their wells.

Comment #2 - A letter comment was received from a member of the Warren County Planning Commission that requested that the EPA hold an additional public meeting to discuss the Proposed Plan with the public. The commenter also asked if it would be possible to send written comments shortly after the September 26 deadline.

EPA Response: EPA called the commenter on September 15, 2005, and explained that EPA would not hold another public meeting at this time. It was also explained that approximately one week prior to the public meeting a large mailing was sent out to all of the key local officials, and a half page sized notice was printed in the July 27 Express Times local newspaper announcing the meeting. In addition, various members of the Warren County Environmental Commission sent an e-mail announcement of the meeting to a large list of interested persons and included an attached file of the Proposed Plan. Over 30 people attended the meeting. Subsequent to the meeting, EPA answered additional questions from the public on the telephone regarding the Proposed Plan and other site-related topics. With respect to the request to submit comments after the close of business September 26, EPA clarified to the commenter that all comments would have to be received within the public comment period, which ended on September 26, 2005.

Comment #3 - The commentator indicated that his residence is located downgradient of the Pohatcong OU1 Study Area boundary and requested that the residential well on the property be sampled by EPA.

EPA Response: The NJDEP, in conjunction with the Warren County Department of Health, is responsible for sampling residential wells in the area referred to as the OU2 Study Area, and it is EPA's understanding that NJDEP has been arranging for the installation of individual treatment systems on those potable residential water supplies when contamination has been encountered above health based levels. In order to find out whether the NJDEP is currently planning to sample

residential wells in your area, you can contact Mr. Rocky Richards of the NJDEP at 609-984-2990.

Also, both the NJDEP and Warren County Department of Health have recommended sampling schedules for homeowners to follow who have residential wells, and that this sampling and associated costs are typically borne by the homeowner. In the event that during such sampling contamination is encountered above a health based level, the NJDEP and the Department of Health should be contacted. For the Warren County Department of Health, please contact Kevin Cavotta, at 908-689-6693, for information on sampling schedules.

Comment # 4: We have had an opportunity to review all of the information that has been sent to us regarding the Superfund Program Proposed Plan for the Pohatcong Valley Groundwater Contamination Site Operable Unit I Study Area and have the following comments:

1) We would like to see the same attention that was given to OU1, be given to OU2.
2) A more detailed calendar time line should be given with regard to the remediation.
3) We would be interested in possibly being involved in the testing of our property. We would need additional details as to the process.
4) We currently have a Superfund filtration system in our home and question whether OU2 should move toward conversion to city water. Is this being considered in the OU2 remediation plan?

EPA Response:

1) EPA is close to completing the planing stage of the OU2 remedial investigation work and expects to begin the first phase of field investigations in 2006.
2) EPA will continue to keep the community informed regarding the progress of investigation work for the OU2 Study Area. In addition, the public should feel free to contact EPA representatives for this Site to get updates.
3) EPA will contact you in the future, should there be an opportunity and need for testing at your location.
4) The first phase of the OU2 remedial investigation is just beginning and no cleanup alternatives will be developed or considered until the remedial investigation is complete. The public will be involved in the selection of the OU2 remedy after the investigation is complete.

Comment # 5: This letter is in response to the ongoing Superfund Program in the area in which I and my family reside. I live in the OU2 portion of the Superfund area, known as the Edison Lake Development of Franklin Township. It is with great concern that I express my opinion that the agency continues to go forth and remediate the groundwater issues as it has done in the OU2 area. The implementation of a remedy to rectify the contamination needs to continue for the health and welfare of our community. Please keep me informed as to any further progress or developments concerning this matter.

EPA Response: EPA has started the investigation in OU2 but still has much work to do prior to selecting and implementing an appropriate remedial cleanup for OU2. During this process, the community will be informed of EPA's progress at major milestones along the way. Feel free to

contact EPA should you have any questions about the Superfund process or progress toward completion.

Comment #6: The New Jersey Department of Environmental Protection (NJDEP) has created a unique partnership with private law firms. This is known as the Natural Resource Damage Program, aimed at quantifying damages to the land, air, wildlife and drinking water, and then restoring these natural resources. USEPA over the years has compiled a mountain of data documenting such damages in the Pohatcong Valley Superfund Site. The Warren County Environmental Commission (WCEC) asks that USEPA supply this data to NJDEP and urge NJDEP to immediately initiate a "Damage to Natural Resources" (DNR) suit.

EPA Response: EPA has coordinated closely with the State of New Jersey throughout all activities leading up to the selection of the remedy for Operable Unit 1 of the Pohatcong Valley Superfund Site, including the performance of the remedial investigation, and feasibility study. The NJDEP has received copies and reviewed all of the extensive data collected at the Site.

Comment #7: USEPA data indicates that TCE and PCE contamination of the groundwater in the Washington Borough and Township may have begun in the 1950s or 1960s. Closure of private wells and filtration of the public water supply did not begin until the late 1980's, leaving a very long window of exposure. WCEC asks that USEPA, in cooperation with the appropriate authorities, immediately initiate an epidemiology study to measure the health impacts of this exposure.

EPA Response: EPA does not perform epidemiological studies. These types of studies are performed by federal or state health agencies. Since the potential exposures at the Site potentially occurred from the 1950s through the 1980s, there may be very limited epidemiological data available for use in such studies. EPA has contacted the Agency for Toxic Substances and Disease Registry (ATSDR) and relayed your request. However, please contact Arthur Block of ATSDR directly at 212-637-4307 if you would like to discuss this issue further.

Comment #8: USEPA has identified Alcan, formerly American Can, as a source of the TCE groundwater contamination. Alcan's 2004 revenue was TWENTY FOUR BILLION EIGHT HUNDRED EIGHTY FIVE MILLION DOLLARS ($24,885,000,000). The highest level of cleanup discussed by USEPA would cost $57,240,000 over 30 years, or about 40 minutes' ALCAN revenue per year (see attached). WCEC can find no economic justification for pursuing anything less than the highest level of cleanup.

EPA Response: As described in the Proposed Plan and at the public meeting, EPA considers nine specific criteria as part of the remedy selection process at Superfund sites. EPA evaluates each cleanup alternative developed against each of these criteria to select a remedy that is the best balance overall. The criteria evaluated are: protectiveness; compliance with relevant and appropriate requirements; long term effectiveness and permanence; reduction of toxicity, mobility or volume of contaminants through treatment; short-term effectiveness; implementability; cost; state acceptance; and community acceptance. The financial resources of any potentially

responsible party are not considered in the remedy selection process. The alternative you referred to is GW4 and involves the capture and treatment of the entire groundwater plume. This alternative is the most expensive alternative. However, this alternative has technical drawbacks compared to other alternatives which played a major factor in EPA's decision in not proposing this as the preferred alternative. This alternative would draw so much water form the aquifer that it would likely cause negatively impact surface water streams and water bodies in the Valley and have negative ecological effects as well.

Comment #9: Contamination has affected several thousand acres in the Pohatcong Valley Superfund Site (OU1), and the contamination is spreading into O U2. WCEC asks that the EPA recommend to the Warren County Health Department that TCE testing be added to the permit requirements for any new wells within OU2.

EPA Response: EPA has made the County officials, as well as State officials who regulate the construction of new wells aware of the results of groundwater studies in Pohatcong Valley.

Comment #10: The State of New York has re-opened several remediated contaminated sites because of vapor intrusion. Recent studies indicate that VOC's may be hazardous at levels below those previously deemed safe. WCEC asks that USEPA immediately begin vapor intrusion studies in the areas closest to the contamination sources in Washington.

EPA Response: EPA agrees that a vapor intrusion study within the Pohatcong Valley is appropriate. As stated at the August 4 public meeting, EPA is planning to perform such studies as part of the upcoming OU2 Study Area remedial investigation. The potential for vapor intrusion will be investigated in Washington Borough, in Franklin Township, as well as at a lower portion of the Valley. At the time of the public meeting, EPA expected to initiate this study in 2006. Since this time, in March 2006 EPA conducted a first round of vapor intrusion samples at selected residences in Washington, Franklin, and in Greenwich Townships. A limited second round of samples are presently being planned for several residences and a school in June 2006.

Comment #11: Since the late 1980s, many Warren County residents have been forced to cap their private wells due to water contamination. WCEC asks that these people be compensated for their losses.

EPA Response: The Superfund law does not give EPA authority to provide financial compensation to residents in this scenario. If you would like to discuss this concern with the state of New Jersey, please contact Mr. Rocky Richard's of the NJDEP. Mr. Richard's office can be reached at 609-984-2990.

Comments Received From Alcan and Pechiney Plastic Packaging, Inc., one of the Potentially Responsible Parties (PRPs).

General Comments
RI/FS and Proposed Plan

General comments were presented in the first section of the comment letter from PPPI. The comment letter is attached to this Responsiveness Summary. For the purposes of this Responsiveness Summary, PPPI's general comments have been numbered and are summarized and responded to below. Note that more detailed responses to these comments are presented in the latter portions of the Responsiveness Summary, as points made in PPPI's general comments were reiterated in their specific comments.

Comment 1. EPA has made its decisions for soil and groundwater remediation based on inadequate data, inadequate assumptions and contradictory reasoning. In particular, EPA does not have adequate data to support its assumption that a TCE source area exists under the former ANC building and does not have adequate data to estimate the size of the source area referred to as AC1. In addition, EPA incorrectly determined that the former ANC property is the source of all of the TCE in the OU1 groundwater contaminant plume and is the source of TCE soil contamination. The remedial approaches proposed by EPA based on these incorrect determinations are not based in reality.

EPA's Response: EPA disagrees with this comment. The remedial decision for groundwater is based on extensive data collected during the RI which demonstrated that groundwater in a large area of the Pohatcong Valley is contaminated with TCE and PCE at high levels, warranting active remediation to help restore this important drinking water aquifer. EPA's Remedial Investigation (RI) Report describes EPA's approach used in the RI which covered an exceptionally large area comprised of several thousand acres and over one hundred potential source areas. EPA was successful in delineating groundwater contamination in the OU1 Study Area and identifying specific soil sources through extensive investigations which evaluated operations at facilities representing over 100 potential sources areas, and investigated soil and/or groundwater at 45 facilities.

After performing this notably large investigation, EPA was able to identify only one general area on and adjacent to the former ANC property which contains elevated levels of TCE in soils that are a source of groundwater contamination. The former ANC property was determined to be a source of TCE contamination in soils and groundwater based on data collected during EPA's RI and historical information submitted by ANC and PPPI in response to EPA 104(e) Information Request Letters that included the results of past investigations at this property performed under the direction the NJDEP. These investigations have demonstrated the presence of elevated levels of

TCE in soils above cleanup standards. The former ANC property and the adjacent downgradient property referred to as AC1, were the only facilities identified in EPA's RI which had soils contaminated with TCE at levels above appropriate cleanup levels, and which may currently be acting as an ongoing source of groundwater contamination. TCE was detected at the highest concentrations in the entire Pohatcong Valley in both soil and groundwater immediately adjacent to the former ANC property.

The RI data is not inadequate. The amount of data collected was extensive and all data was collected in accordance with quality assurance protocols. The data clearly demonstrates TCE contamination was detected in a large percentage of soils samples at the former ANC property. As explained in the Proposed Plan, and based on the RI findings, EPA believes that additional areas of TCE soil contamination are present on the former ANC property in areas that have not yet been fully investigated. EPA will defer the selection of a final remedy for soils at the Site until a supplemental soils investigation of the former ANC property, and adjacent properties is performed to fully characterize the nature and extent of this source area. The data collected during the RI is sufficient to support the remedial approach for groundwater.

Comment 2. EPA has failed to identify a current TCE source sufficient to support EPA's calculation of the total TCE mass present in the aquifer. Instead of concluding a source must exist elsewhere, or that EPA's estimates of how much source still exists in soils is incorrect, EPA has taken the approach of creating fictional soil source(s) with specific lateral and vertical dimensions so that it can continue to assert that the former ANC property is the TCE source. EPA failed to consider important data in its proposed decision including: upgradient contamination; lack of perched water beneath the ANC facility property; lack of detection of TCE in deeper subsurface soils indicating a lack of vertical migration of TCE; other potential sources of TCE contamination; and a complex heterogeneous aquifer.

EPA's Response: As discussed in the FS and Proposed Plan, groundwater and soils that contain elevated levels of TCE are present at and adjacent to the former ANC property. The levels of TCE detected in the groundwater and the soils make the former ANC property a past and current source of groundwater contamination. In addition, EPA has a strong basis to believe that additional areas of soils containing elevated levels of TCE are present on the former ANC property, which have not yet been delineated. Despite EPA's conduct of an extensive RI, no other sources of TCE were determined to be present at the Site, either upgradient or downgradient of the former ANC property. EPA has decided to defer the selection of a final remedy for soils at the Site until a further investigation is conducted in the area of the ANC and AC1 properties, to fully characterize the nature and extent of source area contamination.

EPA developed an investigation conceptual site model to apply to all PSA sites equally and identified the main contributors to the PCE and TCE plumes in the Pohatcong Valley. EPA successfully identified the major TCE and PCE source areas in Pohatcong Valley, which included the ANC/AC1 area for TCE, and the MVS/LNL area for PCE. As the identified TCE source areas at the ANC site are located along a railroad spur that exclusively served the ANC facility, are

located in an area topographically downgradient from ANC discharge pipes, as well as upgradient from the AC1 property, the TCE is attributed to the ANC facility as the source. Although some contamination was detected at the AC1 facility, it is only in shallow soils, and, moreover, the impacted portion of AC1 is located immediately adjacent to the former ANC property in a drainage swale downgradient of a known ANC discharge point that was also observed during the RI to have a flow of TCE contaminated water after a rain event. It should also be noted that no industrial activities are known to have taken place on the AC1 property. By contrast, the ANC facility housed a large scale can manufacturing and refinishing facility beginning in the early 1950s, involving an industry that is known to historically rely heavily on the use of chlorinated solvents and has been regulated for the same. The highest TCE concentrations in groundwater were found immediately downgradient of the identified ANC A/AC1 source area, providing additional evidence that the primary source of contamination has been identified. In addition, preliminary data collected under NJDEP oversight in early 2006 at the property further supports EPA's contention that additional areas of TCE contaminated soils remain on-site, beyond those identified in the RI.

EPA did not fail to consider important data in its decision-making at the Site. EPA's RI Report presents a clear, unbiased method for investigating a large site encompassing thousands of acres, several square miles, and numerous potential source areas in the Pohatcong Valley. The RI report describes all of EPA's findings, including: findings that TCE was not present in elevated levels in the area upgradient of the former ANC property; the confirmation that areas of perched water containing TCE exists in the subsurface in the vicinity of the former ANC property; and the confirmation of the detection of TCE in deeper subsurface soils on the ANC property. In addition, EPA is aware that the aquifer underlying the Site is a complex heterogeneous aquifer. Through the RI process EPA has gained an extensive understanding of the subsurface geology and the properties of this aquifer. EPA has taken all of this into account in selecting a remedy for Site groundwater.

Comment 3. The Agency has completed its proposed remedy selection without developing and using an appropriate three-dimensional ground water model that incorporates some of the acknowledged complexities of the bedrock aquifer to simulate fate and transport of contaminants. Although USGS is in the process of developing and completing such a model, which would significantly improve the inadequate model used by the Agency in the RI, EPA has proceeded to apply a simplified two-dimensional model to predict transport within the complex groundwater aquifer and to select a remedy based thereon.

EPA Response: As presented in the RI/FS documents, the groundwater model used by EPA calibrated well to field-measured data and was tested against known aquifer responses using a long-term pumping test. The results of these efforts demonstrated that the model was sufficient and appropriate to be used during the Feasibility Study to evaluate and compare various groundwater remedial approaches at the Site. A detailed three-dimensional model was not needed to evaluate the groundwater alternatives.

Comment 4. The Agency has skewed its risk and ecological assessments to promote its preconceived source and impact views. The risk assessments indicate significant risk estimates for metals and Polycyclic Aromatic Hydrocarbons (hereinafter "PAHs") found at several Potential Source Areas ("PSA") as not warranting further consideration. At the same time, EPA maximizes risk estimates for chlorinated solvents in groundwater by limiting the wells considered to those with elevated concentrations. The risk reduction that can be achieved through the proposed remedial approach is limited due to the continuing exposures to contaminants other than TCE, as well as apparent background exposures. In this case, the Agency is using the risk assessment as a tool to selectively emphasize potential risks from chlorinated solvents in groundwater, even though drinking water in the area has already been addressed specifically to protect against chlorinated solvents.

EPA Response: The Agency did not have any "preconceived" source areas identified for the Site. Sources were identified by EPA based on a thorough, scientific analysis of extensive soil, sediment and groundwater data collected throughout the entire OU1 Study Area which is comprised of over 1,000 acres. This analysis is presented in detail in EPA's June 2005 Remedial Investigation Report. In fact, contrary to assertion, the former ANC PSA facility was arrived at as a more likely source needing further investigation only after the first few phases of RI work had been completed. The ANC facility was initially rated fairly low on the screening list developed of PSAs based on information that the former owner/operator of the ANC facility had submitted to EPA in 1989 in response to information requests. Their responses failed to indicate that TCE was used at the facility, and EPA had relied on this information, in part, to develop its list of PSAs.

As stated earlier in EPA's response to Comment 1, above, the groundwater throughout a large area of the Pohatcong Valley is contaminated with highly elevated levels of TCE and PCE, rendering this important drinking water resource unusable without treatment. This contaminated groundwater, without treatment, poses an unacceptable risk to users, as shown in EPA's human health risk assessment. EPA has targeted the remediation of groundwater based on risks posed by the untreated groundwater to potential receptors. The risk assessment was performed consistent with EPA guidance.

As clearly stated in the EPA's June, 2005, RI Report, (see page 2), and the Proposed Plan, the focus of the RI/FS is chlorinated VOCs, specifically TCE and PCE, due to the extensive contamination of the regional drinking water aquifer. The RI performed at the Pohatcong Valley Groundwater Contamination Site was a comprehensive investigation with the goal of determining the nature and extent of the TCE and PCE groundwater contamination and its sources. Inclusion of the Site on the NPL was based on the widespread detection of primarily TCE and PCE at levels that can be harmful to human health and the environment. EPA initiated the investigation within the OU1 Study Area to identify the sources of the TCE and PCE groundwater contamination and to assess the nature and extent of these contaminants.

EPA prepared a comprehensive risk assessment for the Site, which is the basis for taking the selected remedial action. EPA's risk assessment analyzed all data collected during the RI including

a full suite of VOCs, SVOCs, and metals in accordance with EPA's Risk Assessment Guidance for Superfund. The contaminants of concern in the groundwater and soil are TCE and PCE, and the risk assessment demonstrated that risks posed by these contaminants are unacceptable. Consistent with EPA guidance, all wells that were within the 1 part per billion (ppb) isopleth were included in the risk assessment. As the purpose of the risk assessment is to assess the potential risks and hazards from exposure to the contaminated media, it is appropriate to only include well data from within the contaminated plume. It would only be appropriate to include data points from outside of the plume area if the purpose of the risk assessment was to evaluate the potential risks and hazards to the entire aquifer that underlies the Pohatcong Valley. However, if such an assessment were conducted, the results would underestimate the potential risks and hazards in the portion of the valley that has been identified as containing the "contaminated plume" because the addition of data points from outside of the contaminated plume would decrease the estimated exposure point concentration. Likewise, the results would also overestimate the potential risks and hazards to the portion of the valley that is outside of the identified contaminated plume because the addition of data points located within the plume would increase the estimated exposure point concentration. This approach does not "skew" the results, nor does is "maximize the risk estimates" as alleged in the comment, but rather results in the determination of risk within the contaminated area. This is the goal of the risk assessment. Thus, the current evaluation outlined in the risk assessment follows established Agency guidance and satisfactorily meets the desired purpose of the risk assessment (i.e., assessing the potential risks and hazards from ingestion of groundwater within the identified plume).

A number of compounds other than TCE and PCE were detected in soils at certain facilities which were investigated at levels posing unacceptable risks under EPA's guidance. Since the Pohatcong Valley Groundwater Contamination Site remediation focuses on the TCE and PCE groundwater contamination and its sources, contaminants such as PAHs and arsenic are not being addressed as part of the Superfund remediation, as they are not elevated in groundwater, have not historically impacted the public water supply wells, and were not the reason the Site was listed on the NPL. EPA will monitor these contaminants in the groundwater during the remedial action and will provide the results of the risk assessment for each facility demonstrating an unacceptable risk level due to contaminants other than TCE and PCE to each property owner, as well as to the State of New Jersey and local authorities for appropriate action.

EPA has targeted the remediation of contaminated groundwater based on risk. EPA is selecting a remedy that actively pumps and treats TCE and PCE contaminated groundwater within the area roughly defined by the 500 ppb isoconcentration isopleth, and the use of monitored natural attenuation (MNA) of the downgradient areas until remediation goals have been achieved. This will achieve the goal of restoring the aquifer to its beneficial use as a potable water source without prior treatment and to limit the continuing migration of contaminated groundwater. The fact that the contaminated groundwater plume is currently treated and used as a potable source is not relevant to the selection of the remedy.

Comment 5. The remedy proposed is inconsistent with the National Contingency Plan (NCP) because the RI/FS has not defined all the actual source areas. The remedy will fail

as it relies on a series of assumptions that amount to the "total absence of data".

EPA Response: As stated in EPA's response to Comment 4, the selected remedy will address groundwater contamination, and is consistent with the NCP. EPA will defer the selection of a final remedy for soils at the Site until a supplemental soils investigation is performed in the vicinity of the identified source area at the former ANC property. The selected groundwater remedy is based on extensive data collected during the RI, a risk assessment performed consistent with Agency guidance, a thorough Feasibility Study, state input and public comment. The remedy is consistent with the NCP.

The Following are Alcan's and PPPI's Specific Comments on the EPA OU1 Remedial Investigation Report, June, 2005 (PPPI's note: These comments are presented in page order rather than in order of their significance):

1) ***Pages 24 and 25*** - On page 24, EPA references the 1985-1999 Vannatta Street Well PCE concentrations as being as low as 7.4 parts per billion (ppb). However, the lowest concentration plotted on Figure 1.3a is approximately 30 ppb. The reason for this discrepancy is not clear.

EPA Response: A closer inspection of Figure 1-3a reveals two missing data points, one in each plot of trichloroethene ("TCE") and tetrachloroethene ("PCE"). PCE was detected at a concentration of 7.4 ug/L on March 18, 1998, and TCE was detected at a concentration of 0.1 ug/L on September 30, 1987. Breaks in the data lines can be seen at those two dates on the plots. These results represent the lowest detections of TCE and PCE in the time-series of analytical results for these wells. Both results were stated in the text of the Remedial Investigation Report on page 24, but were absent from the data plots.

2) ***Pages 48-50***, - The EPA describes a limited soil gas survey and how its results were used to winnow down the number of possible source areas subject to actual sampling. That soil gas survey was very limited in terms of numbers of samples taken per property, depth of sampling, and by the nature of the technology applied. Due to the fine-grained nature of most of the overburden materials found at the Site, soil gas is very limited in its effectiveness as a diagnostic or screening tool. In addition, the amount of actual environmental data was insufficient from a technical perspective to exclude the PSAs dismissed by EPA. Generally the Agency does not make decisions about potential contamination based on such limited surveying. Certainly, suspect areas are not normally removed from further consideration based on such minimal screening, especially in light of the limitations of this soil gas technology under these geologic conditions.

EPA Response: The purpose of conducting the soil gas survey was clearly stated in the RI, as an initial-level, investigative screening tool to help evaluate conditions across a very large site consisting of thousands of acres and many Potential Source Areas ("PSAs"). Soil gas data were collected at 33 PSAs and used in conjunction with other data to select sites to implement the first phase of intrusive investigations. Soil gas results were not expected to provide definitive

conclusions about the contamination present at PSAs nor used exclusively in the decision-making process. Information from the PSA Facility Profiles (Appendix A of the RI Report) and site visits were used to supplement the soil gas data. Of the 33 PSAs where soil gas was collected for screening purposes, 22 of the PSAs, or about 67%, were selected for further investigation during the RI. As clearly noted in the RI report, the soil gas survey was but one screening tool of many, including; the evaluation of responses to EPA's requests for information (pursuant to EPA's authority under Section 104(e) of the Comprehensive Environmental Response, Compensation and Liability Act, as amended (CERCLA)", limited or no reported solvent usage, site inspections, likelihood a facility would have used TCE or PCE and amounts of usage, location of a facility relative to the groundwater plume and other PSAs, whether a facility was a petroleum-only related site, and whether there was an ongoing or completed investigation by the NJDEP that would identify contaminants of concern. It should also be noted that the statement that most of the overburden soils were of fine-grained nature at the Site is incorrect. For example, at the former ANC property, several borings completed by EPA and Environ (PPPI's contractor) identified varying lithologies including fine-grained soils intermixed with sand, gravel, and boulders, not solely low permeability soils as stated by PPPI, above. In fact, the Environ report from November 2003 identified several borings in the former AOC 7 cleanup area (at the railroad tracks or spur, near the former foundry) that were abandoned due to boulder refusal.

3) ***Page 49***, last full paragraph - EPA states that modifications were made to the test method used to reduce the sample analysis time. However, those modifications are not described so it is not possible to evaluate the validity of the modified methods adopted for this work. As listed on pages 70 and 71, some PSAs were eliminated without even this cursory level of investigation.

EPA Response: The soil gas analytical procedure consisted of EPA Method 8021A, a gas chromatographic ("GC") procedure using electron capture and flame ionization detectors that allow detection of chlorinated volatile organic compounds and gasoline range hydrocarbons. The GC column used in the field laboratory was 30 meters long. As this GC column is shorter than some other columns used in laboratories, gas traveling through the column has a shorter residence time and therefore a shorter analytical time. While this may have increased some constituent detection limits, the objective of the soil gas screening assessments was summarily fulfilled. The PSA Facility Profiles supplemented the soil gas results to aid in the determination of which PSAs should be eliminated from further investigation based on the presence or absence of chlorinated VOCs. As stated in EPA's response to comment 2 above, PSA elimination was based on a combination of factors including: location (e.g., outside the Pohatcong Valley or close proximity to an investigated PSA), a petroleum-only related site, an ongoing or completed investigation by the NJDEP that would identify contaminants of concern, limited or no reported solvent usage, and facility 104e responses, among others mentioned in the RI. As new data were generated and evaluated through the phases of field investigation, many of these PSAs were reconsidered for further investigation. It should be noted that elimination from further consideration during the RI does not constitute a no further action decision for a given PSA by the EPA or NJDEP.

4) ***Page 50***, second full paragraph - EPA notes that their contractor Performance Analytical was unable to replicate any of its field detections and Maryland Spectral Services was only able to

confirm some. (emphasis added) Yet, EPA treats the data as valid throughout the RI. The inability to confirm results is dismissed, without evidence or adequate explanation, as due to losses during sample shipment.

EPA Response: The 44 quality control samples that were collected in association with the 130 environmental samples were reviewed by an independent data validator. The data validator found the field data to be acceptable and useable. Exceptions were specific constituent analyses (i.e., 1,1,1 trichloroethane and 1,1 dichloroethane) that were intermittently unacceptable throughout the analytical data set. Validator comments can be found in Appendix B of the RI Report. The offsite confirmatory analyses were performed using a GC/Mass Spectrometer on many fewer samples with limited confirmatory results. These results were discounted due to the lack of detections in some field samples and the potential loss of volatiles during sample shipment. For these reasons, the soil gas data were used for field screening purposes only and a high percentage of the PSAs (67%) were advanced into the intrusive investigation phase of the RI.

5) ***Pages 61 and 62***, under the heading Section 3.3.13 - EPA states that ground water samples were collected from permanent wells "using EPA's low flow purging and sample collection method." However, a review of the recorded sampling depths and well construction details included in the RI shows that many of the wells were not sampled at the appropriate depth intervals indicated by EPA protocols. In addition, the length of screen used in many of the sampled wells, including some of EPA's monitoring wells, exceeded the recommended maximum length of ten feet. Therefore, the samples collected may not be representative of the actual groundwater quality beneath the Site.

EPA Response: The comment is an incorrect presentation of EPA's sampling protocol for this Site. All of the monitoring wells were completed in accordance with NJDEP and EPA guidance, and are representative of regional aquifer conditions. Groundwater samples were collected in accordance with the EPA approved Field Operations Plan ("FOP") dated December 1999. This FOP was created using the EPA Region II Low Stress Groundwater Sampling Protocol, dated March 16, 1998. In addition, the pump used to collect the groundwater samples was placed within the screened interval of each monitoring well. Overburden monitoring wells were completed with ten-foot long screened intervals; bedrock monitoring wells were completed with twenty to twenty-five foot screened intervals. The screen lengths and screen intervals for the bedrock monitoring wells were selected based on boring logs, borehole calipers, borehole geophysical data, packer testing where specific zones in the borehole were isolated and tested, and observations during drilling. The drilling observations included several instances where the drill bit dropped several feet in the borehole, a direct indication of open spaces and voids. Detailed field data was evaluated in each case. For example, authorization was obtained from the EPA and NJDEP for completing a thirty-foot long screen interval in bedrock monitoring well PVWCV05, because of the nature of the hydrogeology encountered in the field for individual wells. It was infeasible to target depths in a bore hole for well screens where the lithology or test sample data indicated no flow from the aquifer unit. It should be noted that EPA had contracted with the USGS for technical support, and experienced USGS staff aided in much of this effort. These data were used to select screen intervals that span noted bedrock fractures with the highest concentrations of

chlorinated VOCs. It should be noted that PPPI's current investigation program being conducted under state oversight has run into similar problems with hole collapse, dissolution cavities, and the completion of wells, that EPA had similarly encountered in the field, and the PPPI's comment can be applied in reverse.

6) ***Page 65, Section 3.4.7*** - EPA provides data collected from the OU2 portion of the Site in this section and in several other portions of the RI/FS. It is not clear why OU2 data are provided at this time in a report concerning OU1. To avoid confusion, EPA should consider removing the data and reserving it for another report.

EPA Response: EPA differentiated OU 1 and OU 2 in 2004, after the field work had been completed. The Operable Units are clearly defined in the RI Report. EPA placed the OU2 data in the OU1 RI Report because it may be useful for ongoing investigations by either the EPA or the NJDEP. It makes for an efficient presentation to have all the data and results in one report, especially for completeness and continuity of effort, as these data will be used in the implementation of the OU1 remedy, and for the upcoming OU2 Remedial Investigation/Feasibility Study.

7) ***Pages 82 and 83*** - EPA states that karst development is apparently more prevalent in the area of the Site near the Van Veldhuisen (hereinafter "VAN"), former ANC and Warren Lumber Yard (hereinafter "WLY") properties than elsewhere. The basis for this statement appears to be the presence of a broken rock zone in a well at VAN and of voids in a well at WLY. This section of the RI does not provide the basis for the identification of broken rock zones and voids and it is unclear whether this determination is supported by rock cores, geophysical logging results, video camera logging or other data. However, as EPA acknowledges in the same paragraph of the RI, sinkholes, a characteristic feature of karst, are found elsewhere in the Pohatcong Valley. The EPA also fails to note that many of the other wells in this area did not have extensive voids or broken rock zones, while some wells in other portions of the Site (e.g., near L&L Econowash and Red's Auto Body) did have voids or broken rock zones. Therefore, there is no basis in the data for the determination that this particular area has more karst development than other portions of the regional aquifer. Even if one assumes broken rock zones and voids were correctly identified, evidence from only two wells does not provide sufficient data to conclude that karst development is greater in this area than elsewhere in the Pohatcong Valley.

EPA notes that the open borehole in the injection well on the former ANC property supposedly correlates with the voids detected in a well at the WLY property and the broken rock zone in a well at the VAN property. According to Figure 4-2, the elevations of the three supposedly correlated zones are 315 to 457, 330 to 405 and 303 to 434 feet above mean sea level (ASL) respectively. Although all three zones are in the same geographical area of the aquifer, the technical basis for the hypothesized correlation is unclear. Fractured bedrock, such as that found in the VAN well, is extremely common in the Pohatcong Valley regional aquifer. In fact, the prevalence of the fractured rock is the reason that the carbonate rocks function as an aquifer. Therefore, multiple fractures or broken rock extending over 130 feet may or may not be related to a series of voids in another well which extend less than 80 feet. The presence of three unrelated features in the same

general area of the aquifer over similar, but not nearly identical depth ranges, does not, by itself, indicate any correlation or connection. Before EPA may rely on such a hydraulic connection (e.g. the presence of a fracture zone), geophysical, pumping or tracer tests would need to be conducted to demonstrate a relationship in that particular area of the aquifer.

EPA concludes that the "occurrence and distribution of voids in the bedrock. . . likely form a complex three dimensional, interconnected network typical of karst." Having drawn that conclusion, EPA then goes on to ignore it in its assessment of flow direction, calculation of TCE mass in the ground water and evaluation of remedial alternatives. All of these hydrogeological elements figure in EPA's conclusion about the total TCE in the plume, and therefore, the oversimplification of these aquifer characteristics undermines EPA's descriptions of plume stability and soil sources.

EPA Response: As discussed in EPA's response to comment 5, above, the karstic nature of the bedrock aquifer has been evaluated extensively by borehole geophysical methods and packer testing. These techniques have determined aquifer characteristics in 3-dimensions and identified broken rock zones and voids that have been correlated across many boreholes. Geological cross-sections 4-2 and 4-3, including multiple wells within the bedrock aquifer, illustrate the presence of broken rock and voids across and along the Pohatcong Valley. The broken rock zone in the VAN well and the numerous voids in the WLY well do correlate generally to the injection well open-borehole interval as stated in the RI. The broken rock/void depth zones noted for these three wells overlap at least 75 feet of elevation (330-405) above mean sea level. It is noted that the voids shown on Figures 4-2 and 4-3 are major features similar to water-filled conduits and caverns and are larger than fractures. The RI Report also notes that the injection of water into a carbonate aquifer may enhance karstic development and has defined the unique area of the Pohatcong Valley where development of large voids and broken rock zones occur at a similar interval as the open-bedrock borehole of ANC's injection well. Enhanced karstic development is evident in several local production wells where numerous collapse features have been identified, including at the Vannatta Street municipal public water supply well which has recently been undergoing rehabilitation due to dissolution. The RI Report also indicates that the karstic development process is more prevalent at WLY, ANC, and VAN based on the actual field observations which were then characterized on the RI cross-sections 4-2 and 4-3.

Groundwater flow within the karst system of the Pohatcong Valley is strongly influenced by the structural geologic features of the bedrock. These features consist of faulted and thrust faulted pre-Cambrian igneous and metamorphic ridges that flank both sides of the Valley, and formed by tectonic compression directed from the northwest and southeast. This produced the strongest relative stress-induced fracturing perpendicular to the orientation of the stress. This fracturing aligns with the long axis of the Valley and its influence is observed through the potentiometric surface maps generated from numerous wells in the Valley, and through a transmissivity ellipse developed from transmissivity and storage coefficient data calculated from a long-term pumping test performed by the USGS at the Dale Avenue well. These results all point to a preferential flow direction that is sub-parallel to the long axis of the Valley. In addition, evaluation of acoustic televiewer data from the bedrock boreholes across the Valley revealed a preponderance of high

angle (sub-vertical) fracturing that promotes a high degree of interconnectivity of the voids in the vertical plane. The geology is well noted in the geologic literature and should be consulted for a better understanding of the structural geology of the Valley. A few of these references are as follows (from the June 2005 RI Report): Drake, Avery Ala Jr., 1967; Drake et. al., 1994; and Drake et. al., 1996. It should also be noted that a mapable thrust fault extends approximately through the middle of the Valley, and that several surface water bodies that are fed primarily by groundwater are observed along the trace of this thrust fault.

8) ***Pages 83 through 88, under the heading Section 4.3*** - in this Section of the RI, EPA uses groundwater elevation measurements in the wells to calculate regional groundwater flow. Although EPA acknowledges the complex, heterogeneous and anisotropic nature of the aquifer, its flow analysis includes an unstated assumption that the bedrock aquifer is one single homogeneous hydrogeologic unit. The possibility that some fracture zones and voids within the aquifer may flow in different directions than other fracture zones is not discussed or considered. Analyses by Environ International Corporation (hereinafter "Environ"), PPPI's consultant, of ground water flow near the former ANC property has shown that local flow patterns in this portion of the aquifer do not correspond to the simplistic regional pattern reported by EPA. It is likely that other portions of the regional aquifer also have localized patterns that vary from the regional flow pattern presented by EPA.

EPA Response: See EPA's response to comment 7. The groundwater flow conditions assessed by EPA were based on a network of numerous monitoring wells distributed across the Pohatcong Valley, including the available monitoring wells at the former ANC site, as well as from our understanding of the geology of the Valley. Two separate, synoptic groundwater elevation data-sets were collected from the network and confirmed the overall groundwater flow conditions. EPA recognizes that minor groundwater flow variations may occur on a local level, however, these variations must be considered in the overall groundwater flow regime, and, as noted above, on the structural context of the Valley. The limited amount of potentiometric data used by Environ to support the comment is biased toward flow only on the ANC facility property, since it only incorporates onsite data, whereas even the incorporation of readily available data immediately adjacent to the ANC facility would provide a more balanced presentation of local groundwater flow. EPA's understanding of the flow is based on a much more complete and comprehensive data set, and it covers a large area of the Valley. If new data from additional monitoring wells clearly demonstrates an unambiguous local flow pattern within the overall groundwater flow pattern, then EPA would consider and incorporate that information, where appropriate. As noted above, PPPI's restated missive inferring that EPA believes the aquifer is homogeneous is incorrect. The presentation of the transmissivity ellipse specifically identifies the ratio of aquifer anisotropy (i.e., major to minor axis) as 2.2:1, and the major axis is oriented to northeast-southwest along the same trend as the long axis of the Valley. As noted in EPA's response to comment 7, bedrock fabric has been observed to consist of broken rock and void zones and high angle fractures resulting in a high degree of 3-dimensional interconnectivity.

9) ***Page 84, second full paragraph and Page 94 - second bullet point*** - EPA makes the statement that perched aquifers were found at the former ANC plant. That is incorrect. As is true

throughout these documents (RI/FS and Proposed Plan), the Agency disregards property boundaries and assumes the railroad property adjacent to the former ANC property, and AC1, are part of the former ANC property. Again, that is incorrect. These are independent properties, each with its own operational history. Multiple borings by Environ and work by CH2M Hill on behalf of EPA did not find any perched aquifers on the actual former ANC property.

EPA Response: For the purposes of the remedial investigation, the ANC site was considered to include the adjacent railroad property. This is partly because the referenced railroad property is a short spur off the (former) main railroad line that exclusively served the ANC facility. For this spur, there is no separate operational history other than that related to deliveries and other transportation services directly to and from the ANC site. Furthermore, EPA obtained title information to determine ownership/ possessory interest of Lot 1, Block 37, that includes the railroad spur that lies within this parcel and found that PPPI has owned this property since 1999 and its plant predecessors have owned this parcel since 1958. The railroad spur portion of this property receives discharges from the ANC facility through storm water runoff and other direct discharges through conduits on the ANC facility. Since the other surrounding industrial/commercial facilities adjacent to ANC, such as Vikon Tile, AC1, and Warren Lumber Yard, occur at a lower topographic elevation relative to ANC, EPA considered contamination from this area to be related to the ANC facility. See also EPA's response to Comment 20, below. As clearly noted in the RI, perched water-bearing zones are of limited areal extent, (please refer to the definition on pages 83-84 of the RI), and refer to observations adjacent to ANC's railroad spur.

10) ***Pages 89 through 94, under the heading Section 4.4, Appropriateness of Ground Water Model; Ground Water Model Application; and Ground Water Model Predictive Scenarios*** - EPA provides modeling results to characterize the ground water flow regime in the bedrock carbonate aquifer. EPA acknowledges that the bedrock aquifer is complex and on page 82 states that voids "...likely form a complex three-dimensional, interconnected network typical of karst." Despite the complexities of the hydrogeology and pumping test data showing that the aquifer is anisotropic and heterogeneous, EPA used a ground water model that simulated two-dimensional flow and assumed an isotropic and homogenous aquifer. In public meetings, EPA and USGS representatives working with the Agency have acknowledged that they are working on developing a more appropriate model that can simulate more complex conditions. The results of that model are not reflected or referenced in the RI. Since the aquifer is known to be complex, anisotropic and heterogeneous, it is technically unjustifiable to use a clearly too simplistic model in the RI/FS rather than the admittedly more appropriate and complex model that the USGS is completing. The USGS model is likely to be similar to, but more aerially extensive than, the more complex model already developed and used by Environ to address the ground water fate and transport at and near the former ANC property (see Exhibit 1 hereto).

The data used to complete the EPA model was collected at the Dale Street well. Data from pumping tests at this well are then used to characterize the entire regional aquifer, despite EPA's repeated acknowledgment of the aquifer heterogeneity and complexity. Although appropriate wells are present in and around the assumed source area targeted by EPA, no aquifer parameter data were collected from them.

The flow patterns and capture zones predicted by the EPA based on the model do not correspond with known data concerning ground water flow and the known distribution of TCE in the aquifer. In particular, the flow patterns near the supposed source area do not correspond to known flow patterns in the area. The inferred capture zones are also not supported by the forward particle tracking data presented in the RI.

EPA Response: The analytical groundwater flow model presented in Section 4.4 of the RI Report underwent rigorous calibration and verification and was tested for sensitivity to input parameters. The model provides more than a reasonable and workable representation of regional groundwater flow in the Pohatcong Valley. One of the underlying features of the CAPZONE model code is applying computed drawdowns to a non-uniform potentiometric surface based on actual observations. Thus, the measured potentiometric surface is incorporated directly into model simulations.

It should be noted that calibration statistics of mean absolute error and root mean squared error indicates an acceptable fit to measured data of less than 5 percent difference, which the Environ model had not achieved. Similar to the groundwater flow model developed by Environ presented in Exhibit I of these comments, the model presented in the RI Report was based on the assumption that regional groundwater flow could be simulated as equivalent porous media. Use of the CAPZONE model to successfully simulate regional groundwater flow in limestone aquifers is not unique and the model was sufficient to meet its objectives for this Site. The literature contains several similar, well-documented applications of CAPZONE for this purpose (Bair and Roadcap,1991; Bair, Springer, and Roadcap; 1992, Springer, 1990; and Roadcap, 1990). See also EPA's response to comment 36 for more details on EPA's assessment of Environ's model.

11) ***Page 56, Figure 4-2*** - The total depth and casing depth of the ANC injection well shown in this figure does not correspond with the information available to PPPI. EPA shows the well with a total depth of 242 feet below grade and casing extending from the surface to a depth of 98 feet below grade. PPPI's records indicate that this well was drilled to a depth of 350 feet below grade.

EPA Response: The injection well is cased to 98 feet below grade and uncased within the bedrock. While the well may have been originally drilled to 350 feet, the USGS observed in the field that the borehole was either obstructed to or collapsed below 242 feet.

12) ***Page 110, first full paragraph*** - EPA used very limited, shallow soil gas and surface soil sampling to determine if properties were PSAs for either or both the TCE and PCE plumes. Clearly, EPA had concluded that these shallow soil conditions were indicative of subsurface impacts. Yet, in evaluating the former ANC property (which was sampled more than any other property within the Site), EPA ignores shallow findings and asserts that the non-detection of TCE at depths below six and a half feet at the former ANC plant, is not evidence that deeper soils are not impacted. On the former ANC property only, EPA believes the TCE was apparently leached through over eighty feet of intervening low permeability soils to reach the ground water while leaving no detectible trace behind in the predominately fine-grained soils at the former ANC property.

The Five Carp Company location is illustrative of EPA's inconsistent approach here. EPA knows that this property was the site of multiple lagoons and years of solvent use. EPA also knows that NJDEP required the closure of the lagoons. Yet, in assessing this location, EPA concludes that because it does not identify solvents in the shallower soils, the impacted ground water beneath the Site must be due to offsite sources. Groundwater impacts were found at this location in both overburden and bedrock wells. In addition, the concentrations detected were elevated over those in the other nearby wells. No consideration is given to the possibility that the impacted soils were removed as part of the NJDEP closure in 1995, that residual soil impacts may only be found at depth, or that these groundwater impacts may have occurred pre-1995, i.e. pre-source removal. Instead EPA simply dismisses this area as a possible contributor to regional impacts.

EPA Response: EPA previously responded to this comment, in general, please refer to EPA's responses to comments 2, 3, and 4, above. EPA collected soil and groundwater samples at PSAs that were selected for intrusive investigation. At these sites, samples were not limited to soil gas and surficial soil samples. Soil samples typically were collected at the surface and at depths of 2, 8, and 15 feet. Groundwater samples were typically collected at these sites at the first encountered saturated zone and above bedrock. For sites where permanent monitoring wells were installed, groundwater samples were also collected in completed overburden wells, during bedrock packer testing of multiple flow zones, and within permanent wells subsequently constructed in the bedrock. At the former ANC property, several borings completed by CH2M HILL and Environ identified varying lithologies including fine-grained soils intermixed with sand, gravel, and boulders, not solely low permeability soils. In fact, the Environ report from November 2003 identified several borings in the AOC 7 area (at the railroad tracks or spur, near the former foundry) that were abandoned due to boulder refusal. ANC performed remediation of soils at AOC 7 contaminated with TCE and cis-1,2 DCE at concentrations up to 400 and 490 ppm. Soil borings were completed by Environ to a depth of about 50 feet in this area. Soil screening by a photo ionization detector ("PID") resulted in readings greater than 100 ppm at depths of 24 to 34 feet, but soil samples collected to evaluate what was causing these readings were not always taken from the most-impacted depth zones. These borings were not extended to bedrock in this area so an adequate assessment of the full overburden thickness has not been completed by ANC at this location.

PPPI's inference of the assessment at Five Carp Company is incorrect. At Five Carp, deep soil borings and groundwater sampling were performed directly beneath the former wastewater lagoons. Permanent monitoring wells within the regional aquifer were also installed by drilling directly beneath the former lagoons at Five Carp. Since no TCE or PCE were detected in the soil samples, the groundwater detections were ascribed to the regional groundwater contamination.

13) ***Page 110, Scenario C*** - EPA makes the statement that "elevated chlorinated VOC concentrations represent an on-going source whereas lower concentrations represent a historic source." That statement is a gross oversimplification of the possible variables involved in determining the concentrations of chlorinated VOCs found in sampled groundwater at a given time. For example, what was the starting concentration? If the groundwater was originally at saturation, but now shows 500 ppb it may be an older condition than a finding of a residual of 100

ppb if the original concentration were 110 ppb. This type of oversimplification of variables is illustrative of EPA's approach throughout the RI/FS and Proposed Plan.

EPA Response: EPA derived the outlined scenarios as a consistent method to apply to all sites being investigated, regardless of the initial concentration of the contaminants, the residence time for the contaminated media, the degree of attenuation since emplacement, and the current contaminant concentrations. EPA's conclusions were based on actual detections or absence of TCE or PCE, including the presence or absence of daughter breakdown products, which is a more accurate overall indicator than estimating starting concentrations and other indirect criteria, as suggested by the comment. For further discussion regarding the role of breakdown or daughter products, please refer to EPA's response to comment 17; and response to comment 74 for a discussion of Site heterogeneities. In general, if a contaminant was not detected in the soils, the PSA was considered not to have impacted the groundwater. If the contaminant was not detected in groundwater, then the PSA was also considered not to have impacted the groundwater. The only situation where EPA considered the PSA as a potential on-going contributor to groundwater was if the contaminant was detected in the soil and in the groundwater. In the case of the suspected PCE source areas at L&L Econowash ("LNL") and Modern Valet Services ("MVS"), soil sampling did detect PCE though not in exceedance of NJDEP IGWSCC. However, a temporary well-point groundwater sample beneath the LNL site provided a PCE detection of 1,500 ppb and a permanent monitoring well at MVS provided a PCE detection of 40 ppb, thus indicating that these PSAs were most likely historical sources of the PCE groundwater contamination. Since the original soil concentration is unknowable for all the PSAs, the EPA's approach is considered appropriate to identify the source areas.

14) ***Page 110, Scenario D*** - Under this scenario, EPA makes the assumption that if chlorinated VOCs are not detected in the soil, but are detected in the groundwater, the possible source area is no longer to be considered a past source for chlorinated VOCs to the regional aquifer. Given the small number of samples taken and the shallow depths sampled in relation to the regional water table, this statement is premature and too simplistic. In addition, if this assumption were applied to the actual data generated for the former ANC property soils, that facility would not be considered a source of TCE to the regional aquifer either. EPA has taken a clearly elementary and inconsistent approach with respect to soil findings. (See also comment 11 above.)

EPA Response: The comment misstates the RI Report. If chlorinated VOCs are not detected in the soil, but are detected in the groundwater; the PSA is no longer considered to be a source (meaning a current or ongoing source) for chlorinated VOCs to the regional aquifer. The sampling approach used at the Site targeted the areas where soil contamination may be found based on a number of assessments, including but not limited to the 104(e) responses, Facility Profiles, site inspection results, and locations relative to the plume. See EPA's responses to comments 2 and 13, above. This approach was consistently used at all PSAs to preclude the potential for unfairly targeting one PSA over another.

According to 104e responses from both PPPI and ANC, TCE was used at the former ANC facility. Furthermore, historical investigations conducted by NJDEP, and by ANC and PPPI under NJ's

Industrial Site Recovery Act ("ISRA") at the facility have found TCE contamination in both soil and groundwater at various locations on the property: 1) adjacent to the main building and along the property boundary that ANC had remediated, and 2) in soil samples collected during the RI from the ANC facility and within the ANC property boundary.. During the RI investigation, EPA found TCE contamination at the highest concentrations in the OU1 Study Area in both soil and groundwater on or adjacent to the former ANC property. In early 2006, at NJDEP's request and under its oversight, PPPI performed sampling underneath the plant along drain lines in the area EPA refers to in the RI Report as ANC C. The preliminary results from this sampling confirm the presence of TCE contamination well above NJ IGWSCC in both shallow and deep soil samples in a recently installed boring advanced to groundwater. These findings support EPA's conclusion that this facility is a source of TCE groundwater contamination at the Site.

15) ***Page 110, last paragraph*** - EPA states that it is assumed that "migration of contaminants from soil to groundwater is the main migration pathway and that residual contaminant concentrations remain in soil source areas at detectable concentrations." Having reached that conclusion, EPA then disregards data from the former ANC plant that repeatedly shows TCE as non-detectable at depths below about 6.5 feet. For example, samples taken under the outside plant wall near AOC 7 showed no TCE. Despite this finding, EPA speculates that TCE found in AOC 7 is connected to a source beneath the southwestern corner of the building. The Agency also disregards multiple boring logs which demonstrate that no perched water was detected beneath the former ANC property. This inconsistent approach to Site assessment is applied only to the former ANC property throughout the RI/FS and Proposed Plan.

In this same paragraph, EPA alludes to "investigation constraints" that may have prevented contaminant identification in minor source areas. Those constraints are never defined. Considering that EPA found it necessary to create significant source area(s) near the former ANC property to "explain" its ground water calculations, perhaps the constraints noted are the better explanation of why identified source areas are not sufficient in EPA's view to explain the Site findings.

EPA Response: The comment is not supported by the data, historical or present. The approach used by EPA does not differentiate where in the soil column the soil contamination is found. The detection of chlorinated VOCs in any soil sample collected would indicate the potential of a release at the site and implies that the contaminant was or continues to be present at the site. Moreover, regardless of how the contamination may have gotten there, it was in fact detected and is therefore relevant. EPA has noted that ANC and PPPI have conducted remediation efforts which have detected TCE with concentrations up to 400 ppm in soils. A review of the information provided by PPPI concerning remediation conducted at the referenced area AOC 7 indicated that the remedial excavation ended at the building foundation and was not based on sufficient sample results. Furthermore, in 2005, the NJDEP expressed its serious concerns about the accuracy and adequacy of the data collected at the ANC facility, and required further detailed investigations at numerous locations, including underneath the building along piping runs which also happens to be the location that EPA refers to as ANC C. See EPA's response to comment 14, above for a discussion of PPPI's recent sampling at the ANC C area.

The investigation constraints did not limit EPA's ability to identify a significant source area for the PCE and TCE plumes. EPA clearly presents the assumptions and rationale for the suspected source area in the Feasibility Study. EPA's conclusion that ANC C is a source area is being borne out by the recent sampling conducted by PPPI (see EPA's response to comment 14, above.) EPA will investigate this area further as part of a supplemental soils investigation.

16) ***Page 113, last paragraph*** - There is a typographical error. The phrase "the data require" should be either "the data required" or the "data requires."

EPA Response: The typographical error is noted.

17) ***Page 122, Section 5.6.3, last bullet*** - EPA states that whenever the main contaminants of concern were not found in soils at a PSA, but were found in groundwater samples, that possible source area was concluded not to have contributed to the regional groundwater impacts. However, on page 100 of the RI, EPA states that a limitation of the RI approach is that historic soil source areas at a possible source property may no longer be identifiable due to contaminant degradation. Clearly, the dismissal of a PSA based solely on the very limited soil sampling done here flies in the face of EPA's own statement about degradation. Again, EPA has taken an inconsistent position in its own RI.

EPA Response: EPA acknowledges the statement on Page 122, but contrary to the comment, finds that Page 100 contains Figure 4-6 (Transmissivity Ellipse) with no reference to a limitation statement. A limitation statement is found on Page 110, however. If a major soil source for PCE or TCE concentrations existed at a PSA, it is likely that degradation would be insufficient to eliminate all detectable concentrations and the PSA could be identified. As mentioned in EPA's response to comment 13, degradation by-products of TCE and PCE have not been found in the soils throughout the Valley, indicating limited source areas. Minor soil sources may have degraded to a point where the remaining concentrations are undetectable, rendering identification of a PSA as a likely contributor to the groundwater contamination impossible. The groundwater contamination is extensive in the Valley and the highest contaminant concentrations are found in one general area, so the EPA considers that the major source areas have been identified. Lastly, the dismissal of PSAs was not solely based on the sampling results. A Facility Profile, prepared from a PSA's 104(e) response, targeted site inspections, and agency document reviews were factored into EPA's decision-making process on whether to retain a PSA for further investigation or eliminate it. In several cases, EPA retained PSAs for Phase 1B that had a low score on the decision model (see RI table 5-4) or added them later in Phase 2 because of continuing concerns about site history or proximity to identified contamination. As clearly stated in the RI, the ANC facility is one such case in point, as it had originally scored relatively low in terms of its initial ranking. However, PSAs were re-evaluated throughout the RI process based on all available sources of information including new information. The re-evaluation included the location of a PSA relative to soil or groundwater sampling results, identification of the plume "hot spots," and/or its ability to have contributed to the groundwater contamination. ANC was retained because TCE was detected in soils at levels substantially above the cleanup criteria, whereas, no other PSA had detections of TCE above the criteria. An industrial survey of AC1 did not find any

past or current industrial or other use of the AC1 property that would have contributed to the contamination found at this PSA. Furthermore, AC1's downgradient location proximate to the former ANC facility suggests that contamination from ANC migrated to AC1. See EPA's response to comment 20, below, for a more detailed discussion of this issue.

18) ***Page 123, last two bullets*** - EPA data summaries in tables and figures for the Site fail to show results for samples where contamination was not detected. This is misleading and confusing because it presents only a portion of the data and suggests that contamination was encountered throughout the study area. In fact, the absence of TCE at certain locations at or near the former ANC site (e.g., PVANC50 at AOC 16) is significant and contradicts certain EPA arguments in the RI/FS and Proposed Plan.

EPA Response: The RI clearly states on Page 123 that " . . . if chlorinated VOCs were not detected in a sample, they would not be shown on the summary tables." All the data are included in the RI Report, but only the detections were included in the summary tables. It is unclear which EPA arguments in the RI/FS and Proposed Plan would be contradicted by including the non-detection of TCE at PVANC50, especially considering the TCE detections in nearby soil samples PVANC31 and PVANC27.

19) ***Page 124*** - EPA indicates that surface water was sampled at the former ANC property. In actuality, EPA reportedly sampled flow from a stormwater drain and from areas of surface flow during a rainstorm downslope from stormwater drains. This is not surface water as it is usually understood. There are no actual surface waters on the former ANC property.

EPA Response: The surface water samples were collected from the drainage pipe (previously reported by PPPI to be from storm water) and from surface water run-off. As these were not representative of groundwater, the samples were considered to be surface water for the purposes of the RI Report.

20) ***Page 123, Section 5.9.1*** - In its description of past uses of AC1, the EPA identifies a "major interchange" of the Morris Canal, as well as railroad tracks and sidings. EPA reports that digging on this property may have found the track substrate still in place. Fill of unknown nature for the Morris Canal may be present on or adjacent to the property. Normally these uses would constitute "recognized environmental conditions" in ASTM parlance. EPA disregards them and attributes all soil impacts on AC1 to the former ANC plant. This attribution is made despite the lack of data linking conditions on the two properties. No satisfactory explanation for this skewed Agency approach is provided in the RI.

EPA Response: The comment may have intended to refer to Page 133. The investigations performed at the ANC, AC1, Vikon Tile Company (VTC), and Warren Lumber Yard (WLY) PSAs were performed as stand alone investigations to determine their potential as source areas for the regional groundwater contamination. EPA is unaware of any past or current industrial or other use of the AC1 property that would have contributed to the contamination found at this PSA. Soil borings were taken and multi-depth soil sampling was performed at each site and groundwater

samples were collected from overburden and bedrock wells. Included in these sampling events were a few locations on the WLY and VTC properties along the filled portions of the former-Morris Canal, and suspected areas of ground disturbance in the AC1 basin identified in aerial photographs. After field observations and analytical results from these PSAs were evaluated, a site model was developed that showed a linkage between the sites. The former ANC property is upgradient of AC1, VTC, and WLY topographically (i.e., surface water flow) and either upgradient or side-gradient based on groundwater flow. Discharges to the surface were observed during the RI to flow from the former ANC property toward the AC1 property to the south, through an underdrain beneath the ANC railroad spur toward the WLY site to the west, and from another direct discharging pipe toward WLY to the west. The current orientation of these discharge pipes match site plans provided by PPPI for the ANC facility prepared in the 1950s and 1960s. For a portion of that time period, the ANC facility had not been connected to the sanitary sewer, and the current property owners and facility managers have said they do not know how wastewater was disposed, nonetheless, TCE appears at numerous locations on and immediately adjacent to the former ANC property, as well as in the soils at depth.

21) ***Page 134, first paragraph under Heading Phase 2*** - The EPA states that a bedrock well that was installed on the Vikon Tile property about 175 feet west of the intended location of the AC1 well is representative of groundwater conditions on the AC1 property. Given the heterogeneous nature of the aquifer and lack of knowledge about fracture patterns and flow in this specific area, this statement has no technical basis.

EPA Response: The groundwater elevations from the area monitoring wells and the geologic features of the area were used to assess the groundwater flow conditions. To the east of the ANC/AC1 sites are Pre-Cambrian igneous/metamorphic rocks of the Upper Pohatcong Mountain. The carbonate rocks, which comprise the Pohatcong Valley aquifer, overlie these Pre-Cambrian rocks and have a geologic dip to the west in this area which is coincident with the groundwater flow direction provided by the groundwater monitoring wells. Therefore, the EPA continues to consider the bedrock monitoring well installed at the furthest upgradient portion of the Vikon Tile site as representative of the bedrock groundwater quality conditions at the AC1 site. Also, it should be noted that a deep overburden well was installed and sampled on the AC1 site. See also EPA's responses to comments 7 and 8.

22) ***Page 137, Figure AC1-1 and page 164, Figure ANC-2*** - The swale indicated on these figures is not clearly defined in the field and consists of some minor erosional features caused by sheet runoff. Characterizing this area as a drainage swale is a misrepresentation of the actual physical features and drainage patterns in this area since it implies that flow has and will move at a rapid pace through a well-defined channel when no such channel exists.

EPA Response: There has been no misrepresentation of data in the RI Report. All data points are clearly shown on figures so the reader can see where all contamination was detected. The remedy was selected not based on property lines, but based on actual data and information collected throughout the site. The cleanup will address appropriate areas of contamination, regardless of property lines.

The swale was identified in the field as a shallow, trough-like depression that carries water during a rainstorm. As much of the surface water runoff from the ANC outfall in the area (ACO-16) is now directed through the drain under ANC's railroad spur, the swale has not formed a well-defined channel, although it may have historically before the underdrain was exposed through erosion. Also note that the drainage pattern is represented on the USGS Washington, NJ, 7.5 minute topographic quadrangle map.

23) ***Page 137, Figure AC1-1 and pp. 431 and 432, Figures 5-4 and 5-5*** - The definition of individual sites or properties in the area to the west and south of the former ANC property is inconsistent and appears to be designed to misrepresent the data. The Norfolk Southern Railroad property is not indicated on the map and most of this property is characterized as being part of the "ANC site." The other PSAs in this investigation are generally identified by property boundaries. However, the so-called "ANC site" has been singled out and defined to include large portions of the Norfolk Southern property. In some maps, the southern portion of the so-called "ANC site" is defined by a dashed line connecting Warren Lumber Yard with AC1. In other maps, this dashed line is absent. This inconsistent identification of site boundaries and failure to differentiate between the Norfolk Southern property and the former ANC site results in a misrepresentation of data collected on the railroad property as equivalent to data collected on the former ANC property.

EPA Response: See EPA's responses to comments 9 and 20. Based on a title search and observations of ANC discharges flowing onto adjacent properties, the ANC site was considered to include the railroad spur that exclusively served the ANC facility. The remaining areas shown on the referenced figures (former main rail line and swale areas) are topographically downgradient from the former ANC facility and have likely received run-off from ANC property for a long time. With respect to the past ownership of the Warren Lumber property, PPPI's February 2004, 104(e) response indicates that this property was owned by PPPI for a 10-year period in the 1970s-1980s, and in a subsequent 104(e) response, PPPI contradicts its previous statement and asserts that this property was never owned by ANC or PPPI, without providing back-up. A title search for this property may clarify these issues.

24) ***Page 148, third paragraph*** - The EPA summary of the data provided in response to EPA's information requests 104(e), is technically accurate but fails to mention a clarification that was provided to the EPA in a subsequent meeting. TCE was incorrectly listed as a substance that was known to be used at the Plant. Small quantities of another chlorinated solvent (1,1,1,-trichloroethane) were used at the Plant and personnel inadvertently confused the two chemicals with similar names. Please correct the record to indicate that the current owners of the former ANC facility have no record of TCE use at the facility.

EPA Response: It is unclear when the meeting occurred where the usage of TCE at the facility was clarified by PPPI. EPA does note that in its 104e response dated November 22, 2004, PPPI indicates that it had erred in identifying to EPA and NJDEP that TCE was used in a laboratory known as WTC and that the correct solvent was 1,1,1-trichloroethane ("1,1,1-TCA"). PPPI's 104e response dated February 10, 2004, made no mention of TCE usage at WTC in Table 5-1, though 1,1,1-TCA is listed. In this submittal, PPPI identified, though without explanation, that it used

both TCE and 1,1,1-TCA (among others hazardous substances) at the facility. In its November 2004 104e response, PPPI clearly indicates that a former employee identified that TCE was used to clean metal tubes at the plant. PPPI's assertions in this comment conflict with its 104e submittals. The record indicates that TCE was used at the facility. Furthermore, TCE is present in both soil and groundwater at the facility which supports the conclusion that TCE was used at the facility. See EPA's responses to comments 14 and 15, above.

25) ***Page 149, second full paragraph*** - The EPA states that debris and disturbed areas were observed in the vegetated land on the southern portion of the former ANC facility. No evidence is provided to substantiate this comment and no data are provided concerning the type and nature of debris and disturbance. The southern portion of the property currently contains only minor debris near the edge of the parking lot and the only visible disturbance to this area appears to have been generated by recent investigational activities.

EPA Response: Debris and disturbed areas were noted during the surface geophysical investigation conducted in this area (RI Report, Appendix C). The debris included scrap metal, old tires, mattresses, etc, and there were mounds of mixed soil and miscellaneous waste observed. Moreover, an aerial overhead photograph from the 1960s clearly identifies that a very large, somewhat haphazard waste and debris staging/storage area was clearly located here, as identified.

26) ***Page 150, first full paragraph*** - EPA states that two reports suggest that dumping occurred to the west of the former ANC property and in a swampy area south/southwest of ANC's railroad tracks. These two reports are not further identified. EPA did various site surveys at the former ANC property to determine if drums had been buried or if onsite disposal had taken place and found no evidence of either. However, similar surveys were not completed on adjacent properties, including the Norfolk Southern and AC1 properties. Some statement as to the lack of support for these "reports" should be included in the RI if the reports are mentioned at all. In addition, reference should be made to the reports that other entities dumped drums on property behind the former ANC property, along the railroad right-of-way and in the swampy area at AC1. The EPA fails to investigate or discuss in any detail several independent reports cited in Appendix A that the former Tung-Sol Tubing dumped TCE and PCE wastes in this area. The EPA should also note in their discussion of the potential origin of this supposed source area (Section 5.10.1) that dumping was reported to have occurred in this area and that the known distribution of TCE contamination is indicative of surface dumping on the railroad and AC1 properties and does not support the proposed origin as surface runoff from the former ANC property.

EPA Response: The two reports referenced were the 1997 File Review Findings Report, and the 1989 Industrial Survey Findings Report, both prepared by ICF, EPA's contractor. The reports were summarized in the 1999 Report by ICF entitled Potential Source Areas Profiles, which is included, in full, in the RI Appendix A. The verbal comment referred to in the report is a statement that mentions the following: "Several verbal reports indicate that Tung Sol may have used TCE or PCE, and may have dumped process waste in the Pohatcong Valley and possibly behind American National Can." It should be noted that the reference relating to the ANC PSA Profile was vague and did not present specific information regarding locations or whether actual materials or

contaminants were actually dumped, or who had made these verbal statements. However, the physical evidence obtained during EPA's RI relating to Tung Sol shows it to have been a historical source of PCE contamination, not TCE contamination. EPA investigated the former Tung Sol facility, and it should be noted that the field investigation did not detect any elevated TCE levels above a limited number of very low "J" values (which are detections below the method detection limit), and no TCE was detected below 2 feet in depth. Moreover, there were no significant TCE detections in groundwater in the area of Tung Sol, these being at 1.5 ppb, and 2.2 ppb, and Tung Sol is located quite some distance outside and side gradient to the 5 ppb isoconcentration line for the TCE groundwater plume. There is significant PCE groundwater contamination near and at the Tung Sol location, and Tung Sol had detections of PCE in soils up to 190 ppb, therefore, Tung Sol has been identified as a suspected historical source of the PCE plume, not the TCE groundwater plume. It is pure speculation that Tung Sol could have been involved with the TCE contamination that is ubiquitous in soils, groundwater, as well as underneath the former ANC building. The identified reports of dumping could not be substantiated by EPA and are not germane without further evidence. Therefore, this speculation was abandoned in favor of more direct evidence of direct evidence of TCE detected at the former ANC facility. (See EPA's response to comment 35).

Regarding the alleged dumping of drums, EPA interpreted the swampy area as referring to the rear portions of AC1 and/or Vikon Tile, and west of ANC, as the former railroad bed, and these areas are both low topographic areas, known to periodically contain standing water. All of these areas have been investigated and the results are provided in the RI Report. A surface geophysical survey was conducted in the southern-most section (triangular-shaped portion) of the former ANC property, and no metallic materials were identified in the shallow subsurface. Similar confirmatory investigations were not performed in the swale area adjacent to ANC's railroad spur or on the western side of the railroad spur adjacent to the WLY property. Based on the topographical and surficial evidence, the former ANC property is considered to be a major source of the TCE in and around the railroad spur. See EPA's responses to comments 9 and 20, above. Moreover, this area will be investigated in more detail during the supplemental soils investigation.

27) ***Page 150, second full paragraph*** - Here the EPA seems to find fault with ANC because records of offsite waste disposal, which may have taken place decades before the RCRA requirements were in place, are not available. It is interesting to note that no such skepticism is applied to other possible source owners such as AID MODELS or BASF, who, according to the RI, stated they did not use TCE but provided no documentary evidence beyond their mere statements.

EPA Response: As stated previously, RI conclusions relating to the source areas was based on actual physical evidence and detections of TCE. The lack of TCE or PCE detections in soils and groundwater at the AID Models facility supports their claim of no TCE or PCE usage. The same for BASF, where the lack of soil detections of TCE or PCE, coupled with the low or trace concentrations of TCE, PCE and other chlorinated VOCs detected in groundwater underneath and near their facilities indicates a relatively minor and/or degraded source, or groundwater migration from another location. Whereas, at ANC, current and historical soil and groundwater detections of TCE are significantly above trace concentrations, and are found in several locations; all of which points to its usage. Moreover, the highest TCE concentration (hotspot) identified through

groundwater samples during the RI is similarly located immediately downgradient of ANC, unlike the above examples cited in the PPPI comment. See also EPA's responses to comments 14 and 15. Furthermore, PPPI has provided sparse and oftentimes contradictory information in its 104e responses (see EPA's responses to comments 23 and 24).

28) ***Pages 151 - 153*** - On these pages, EPA summarizes some of the investigatory and remedial work already completed on the former ANC property. While the EPA highlights the localized detections of TCE in certain soils, it fails to note that soil samples were taken to define the vertical and lateral extent of these TCE detections. Despite the collection and analysis of a number of samples that were analyzed for TCE from a depth of greater than 6.5 feet, no TCE was detected in any samples collected on the property at a depth below 6.5 feet . EPA offers no credible explanation as to how TCE moved through approximately ninety feet of admittedly low permeability soils to reach groundwater, leaving no detectible concentrations in those intervening feet.

EPA Response: As noted in EPA's response to comment 12, the soils beneath AOC-7 cannot be characterized as low permeability and contaminants could migrate through these soils to the bedrock aquifer. Moreover, the former ANC facility rests over an area of groundwater contamination having the highest, i.e. "hot spot" concentrations, suggesting that the source is nearby. The remediation of soils contaminated with up to 400 ppm TCE was reportedly confirmed by analysis of a few soil samples adjacent to the building foundation, as identified in PPPI's report to NJDEP. However, PPPI presented its results without detection limits, and did not establish the vertical extent of contamination beyond 6.5 feet. This does not confirm the removal of residual concentrations below the NJDEP IGWSCC, since the clean-zone was based on limited sampling only a few feet beyond the excavation depth, which was limited and shallow. As noted previously in EPA's responses to comments 14 and 15, the NJDEP has recently required PPPI to conduct additional extensive sampling to determine if contamination exists under the building and along old piping and drainage runs. The preliminary results of this recent sampling confirmed the presence of TCE contamination above NJ IGWSCC, at depth underneath the building. This area may be further investigated in a supplemental soil investigation.

29) ***Page 152, third paragraph under Heading AOC-7*** - EPA states that post-excavation sampling in AOC 7 did not confirm the removal of contamination on the eastern side of the excavation (i.e., adjacent to the building). However, the post-excavation sampling included several samples along the eastern edge of the excavation and near the building foundations. TCE was not detected in these samples at concentrations above the most stringent New Jersey Department of Environmental Protection (hereinafter "NJDEP") soil cleanup criterion. Therefore, confirmatory sampling showed that the surficial organic impacts in this area, which were removed, did not extend under the building.

EPA Response: See EPA's responses to comments 14, 15, and 28. NJDEP has recently required PPPI to conduct extensive sampling to determine if contamination exists under the building along piping runs in the area EPA refers to as ANC C. The preliminary results of this recent sampling confirmed the presence of TCE contamination above NJ IGWSCC at depth underneath the

building. This area may be further investigated in a supplemental soil investigation.

30) ***Page 155, top of page*** - EPA refers to PVANC39 and PVANC32 as showing perched water is present on the former ANC property. These monitoring wells are not on the former ANC property; they are both on adjacent property owned by the Norfolk Railroad. The RI/FS is strangely silent as to the presence of this once active railroad right-of-way through the Site, just as the RI/FS does not consider the filling of the Morris Canal Channel with unknown materials. The Norfolk Railroad is topographically lower than the former ANC property and therefore the two areas may not be assumed to have the same perched water features or other subsurface conditions. Wells actually on the former ANC property have not identified any perched water.

EPA Response: See EPA's responses to comments 9, 12, 20, 22 and 23. The result of the title search indicates that the railroad spur is owned by PPPI and not by Norfolk Southern. The referenced monitoring wells are on the railroad spur off the main line that exclusively served the ANC facility, with no separate operational history other than that related to deliveries to ANC. In addition, the EPA collected several soil samples from the fill of the Morris Canal located on the VTC and WLY properties. The perched aquifer referenced in the RI refers to an occurrence along the railroad spur, immediately adjacent to the ANC facility.

31) ***Page 156, first paragraph*** - EPA acknowledges that no chlorinated volatile organic compounds, including TCE, were detected in surface water samples collected from a "concrete discharge structure or from an unlined pit in January 2002." However, the water from the discharging end of a concrete pipe (Sample PVANC52) did contain TCE at 25 ppb. PVANC52 is not on the former ANC property as the RI states. Therefore EPA's implicit conclusion that TCE detected at this point is perforce from the former ANC property is not necessarily correct. The fact that nothing was detected in the upslope sample at PVANC50, which is on the former ANC property, may be indicative of an alternative source for the detected TCE. As EPA acknowledges in its discussion, the source of contamination appears to be soil within or near the concrete pipe, which is located on the railroad property. No credible explanation is provided for the apparent continued presence of TCE in soil on the Norfolk Southern railroad and AC1 properties and the relative absence of TCE on the supposed source areas upslope from these properties. It is unclear why the Agency does not consider direct dumping of TCE on the railroad property (as was reported by several sources cited by the EPA) as the most likely explanation for the absence of TCE in the upslope areas and its presence at these two properties.

EPA Response: EPA is not clear what the discrepancy is. In the referenced discussion, TCE was detected in water samples collected from an ANC discharge pipe (PVANC49), forging a direct connection to TCE discharge and the main ANC building. The fact that this discharge pipe is also located in an area (AOC17) where soil contamination was previously identified (and reportedly remediated) leads EPA to consider that TCE was part of the ANC manufacturing process and that historical discharges may have contained higher TCE concentrations, regardless of whether or not TCE is currently being used at the facility. As for PPPI's comment, the TCE associated with the soil in the concrete pipe may have also been contaminated in a manner similar to that of AOC17, by the direct discharge of TCE contaminated water flowing through the pipe itself. The identified

reports of dumping could not be substantiated by EPA and are not germane without further evidence. Therefore, this speculation was abandoned in favor of more direct evidence of active TCE discharge through the pipes.

32) ***Page 156, third paragraph*** - The EPA summary of the soil data is misleading at best since it fails to distinguish between data collected on the railroad property and the former ANC facility and does not note the number of samples with no TCE or trace concentrations in the supposed source areas. An example of the misleading presentation of the data is the fact that 15 (not 10) samples were collected from the 5 borings cited in this paragraph and the range of concentrations was actually 0.007 mg/kg to 13 mg/kg (not 1.1 mg/kg to 13 mg/kg). The arithmetic mean of these sample concentrations is 1.69 mg/kg, marginally above the most stringent NJDEP cleanup criterion of 1.0 mg/kg.

EPA Response: As stated previously (see EPA's responses to comments 9, 12, 20, 22, 23 and 30), the ANC facility was considered to include the adjacent railroad property, especially the portion of the railroad spur that based on a title search appears to be owned by PPPI, and in any event exclusively served the facility. The referenced RI summary clearly states that 10 soil samples from 5 locations contained TCE at concentrations above the NJDEP IGWSCC of 1 mg/kg. However, please note that the number of soils samples indicated in PPPI's comment (15 samples), as well as the 10 samples listed in the RI text, are both incorrect. The correct number of samples should actually be 6. Please note that these 6 are correctly reflected in the supporting RI table; however, the number 10 was inadvertently not updated in the RI text as it should have been, when the EPA and NJDEP had agreed to use the IGWSCC as the proper screening criteria for this Site. In any event, using an arithmetic mean to present these data is not appropriate in this case, where the cleanup criteria have been exceeded.

33) ***Page 156, fourth paragraph*** - Based on results from PVANC39, EPA concludes that TCE in soils beneath the former ANC property extends to a depth of 80 feet. However, as noted above, PVANC39 is not on the former ANC property but was taken from a location topographically lower than the former ANC property. Therefore, findings from PVANC39 cannot be used to characterize the subsurface at the former ANC property. The detected concentrations below the surface are also all well below the most stringent NJDEP cleanup criterion of 1.0 mg/kg and are, therefore, considered by the NJDEP to be insufficient in magnitude to be a source of groundwater contamination. In contrast, soil samples actually taken on the former ANC property which PPPI has provided to the Agency in the past demonstrate that no TCE detections were found in subsurface soils below 6.5 feet. In addition, sampling on the former ANC property and in drainage areas does not support a connection between AC1 conditions and the former ANC property.

EPA Response: See EPA's responses to comments 9, 12, 20, 22, 23, 30 and 32. Sampling locations PVANC39 and PVANC32 lie in close proximity to the unlined pit that conveys water discharging from the ANC property through the underdrain to the western side of ANC's railroad spur and the WLY property. The soil concentrations at these boring locations exceed the NJDEP IGWSCC for TCE near the surface, but do not exceed with depth at these specific locations. However, the continuity of contamination with depth demonstrates the ability of TCE to migrate

from the surface, through contaminated water-bearing zones at 30 and 70 feet in the overburden, and reach the zone near the bedrock surface. Contaminant concentrations may not migrate in a direct vertical path to the bedrock aquifer, or exceed the IGWSCC, due to variations in soil lithology and deflections in the migration route at the perched groundwater zones. Additional studies may be conducted at this area in the future.

34) ***Page 143 and 181*** - On each of these pages, EPA states that a private entity reported that they did not use TCE and EPA accepted that statement. However in reviewing the information provided about the former ANC operations based on interviews with current and past employees, EPA dismisses the lack of knowledge on TCE use as if it has no credibility. The contrast in EPA attitude is noteworthy.

EPA Response: EPA does not understand this comment in light of the information provided by ANC and PPPI in their 104e responses that confirm past TCE usage at the facility. See also EPA's responses to comments 14, 15, and 24. EPA conducted investigations at a number of facilities cited on pages 143 and 181of the RI report to verify the accuracy of the reported statements. In these cases, no TCE was detected in the soil samples collected from these sites. Consistent with the rationale for investigating other PSAs, EPA conducted an investigation at the ANC site. During the investigation and through document review, TCE was documented to be present at the ANC facility in soils along the rail spur adjacent to the main building (AOC7), in soils at AOC17, and in water being actively discharged through pipes (PVANC49). Furthermore, in early 2006, NJDEP required PPPI to conduct additional sampling to determine if contamination exists under the building along piping runs in the area EPA refers to as ANC C. The preliminary results of this recent sampling confirmed the presence of TCE contamination at the ANC facility above NJ IGWSCC.

35) ***Page 314, under the heading "Conclusion"*** - The EPA concludes that the Tung-Sol Tubing/Pohatcong Hosiery area is "considered a contributory source of chlorinated VOCs to the Pohatcong Valley Groundwater Contamination Site." Yet for the remainder of the RI/FS and Proposed Plan, the former ANC property is viewed as the sole source of TCE to the regional aquifer. No explanation is included as to why the Tung-Sol property is not retained as a TCE source, especially given the report of its significant TCE use, past dumping, both on its own property and behind the former ANC location, and findings of TCE in soils and groundwater at the Tung-Sol property.

EPA Response: Contaminant concentrations detected at the Tung Sol Tubing (TVN) PSA identified the site as a contributory source of PCE and possibly TCE to the regional aquifer. However, none of the chlorinated VOC concentrations in soils exceeded the NJDEP IGWSCC, and the detected concentrations in groundwater were at low levels. In addition, TVN is not located in or near the TCE groundwater hotspot, but is located about 4,000 feet side gradient to the hotspot, and is within the capture zone of the Vannatta Street Well. These findings have eliminated the PSA from further consideration for source remediation, but they do not remove the facility from its role as a contaminant contributor. This contrasts with the findings in the vicinity of the former ANC facility where both soil and groundwater contaminant concentrations have reached several

orders of magnitude above the NJDEP IGWSCC and GWQS. (See also EPA's response to comment 26).

36) ***Page 328, Section 5.9.26*** - EPA has stated that the groundwater flow direction in the Site is to the southwest. Therefore, looking at a map, the VAN location is upgradient of the former ANC plant. Monitoring wells on the VAN site produced TCE detections of 64 parts per billion (hereinafter "ppb") and 16 ppb. EPA attempts to explain these upgradient detections away by attributing the impacts to mounding from the former ANC re-injection well. However, as the attached modeling report demonstrates (Exhibit 1), the re-injection well on the former ANC property does not produce such mounding. In addition, EPA has not demonstrated the hydraulic connection between the deep overburden well in which TCE was detected at VAN and the former ANC property bedrock re-injection well. The fact is, there are TCE groundwater impacts upgradient of the former ANC facility. Groundwater entering the former ANC plant is already impacted with TCE before it passes the northern property boundary. EPA has not adequately investigated the origin of these impacts as part of its RI. This is especially true given statements in ICF Kaiser's (EPA's own consultant) Industrial Survey Report of 1997 that numerous drums were dumped on the VAN property and in a ditch on the north end of this property. ICF Kaiser's Report also notes the presence of two abandoned, rusty tanks on the property. Based on the data collected concerning the past use of this site, EPA's collection of one soil sample from the surface at this property is clearly inadequate to characterize the potential for discharges of contaminants at this site.

EPA Response: A cursory review of Environ's modeling report has identified several issues that are addressed as follows: First, the groundwater flow direction in the model was south/southwest and was apparently based on groundwater elevations from a limited number of monitoring wells around the perimeter of the site. The inferred groundwater flow direction does not take into account the monitoring wells in the surrounding area and the geologic conditions noted at the site, which indicate a more west/southwest direction. Second, the four layer model used does not appear to be grounded in the geologic/hydrogeologic data from the site. For example, based on drilling, EPA did not confirm that a 10 foot "tight" layer exists between a "shallow" and "intermediate" bedrock, and that the overburden (glacial till) layer is fully saturated. Third, the model does not incorporate information from surrounding wells, which limits the boundaries and applicability of the model results. Lastly, the model run data does not appear to calibrate with the measured groundwater elevations from the wells, resulting in significant uncertainty with respect to the model output. The mounding effect is illustrated in EPA's model and Environ's model (Figure 7) and the effect shown is dependent on the groundwater flow direction and calibrated model input values. The mounding would appear to extend back toward the VAN site if the groundwater flow direction was more to the west, consistent with the RI report assessment.

TCE has been detected in groundwater from areas upgradient from the ANC site. Investigations were conducted at several upgradient sites and no soil sources were found. Also, the reported drums at the VAN site were not observed during the RI and therefore could not be substantiated. Based on the known TCE concentrations in the areas upgradient from the ANC site, it is apparent that the TCE concentrations increase as the groundwater migrates through the site. This

contribution to the TCE plume from the ANC area further suggests that the ANC site represents a major source of TCE for the identified plume.

37) ***Page 340, Section 5.9.28*** - As was done with the AC1, EPA assumes that any TCE found beneath the Vikon Tile property is attributable to the former ANC plant. This assumption is made despite the fact that EPA has concluded groundwater flow is to the southwest so Vikon is cross-gradient, not down-gradient, of the former ANC property. The Vikon Tile property was home to a synthetic yarn manufacturing and a yarn-making machine company. More recently, the property has been used by Vikon Tile to make enameled steel and aluminum wall tile. Anecdotal information reported liquid waste was dumped onsite and historic aerial photographs showed probable waste lagoons adjacent to this site just to the east of the railroad tracks. (See Exhibit 2) Recent site assessments completed by Washington Borough show that the facility maintained a waste holding pond and discharged wastewater through a pipe under the railroad tracks to a location on the AC1 property that is immediately south of one of the source areas identified by EPA. In addition, the Vikon property assessment describes a six foot deep drainage vault on the Vikon property, upgradient of the well with EPA's highest TCE reading. No sampling at this apparent waste vault was done; no consideration of this vault as a possible TCE source to groundwater is reflected in the RI or the Proposed Plan. Despite evidence that Vikon's industrial practices discharged wastewater near one of the identified source areas, EPA took a limited number of soil samples at only the corners of the property and found low levels of TCE in one location and other chlorinated solvents in others. TCE was found in the groundwater at the highest level found in OU1. Despite this information, EPA did not take additional soil samples to adequately characterize the property. Instead EPA concludes that Vikon is not a source of groundwater impacts. In addition, EPA persists in attributing the impacts at AC1 to the former ANC property even though the Vikon property operators actually piped their liquid waste to the area of AC1. As is true of many of the EPA-identified PSAs, a paucity of data is used to prematurely eliminate the property as a source of impacts to groundwater and AC1.

EPA Response: Several soil samples were collected from various areas at the VTC site looking for TCE contaminated soils. The areas sampled included those identified as former liquid waste disposal areas, the six-foot deep drainage vault (described as a concrete vault that contained pipes leading under the railroad tracks toward the AC1 basin in the RI), and the former Morris Canal. *Contrary to the description in the comment, the RI clearly demonstrates that extensive soil* sampling was conducted across the site, especially during Phase 1 activities, to identify potential on-site sources. The sampling results yielded only four TCE detections at concentrations only marginally above the detection limit. As such, EPA was unable to find an on-site soil source that would be responsible for the high TCE concentrations detected in the groundwater at the Vikon Tile PSA. Identification of TCE concentrations in soil in an upgradient area (ANC/AC1) is consistent with the observed groundwater TCE plume. Currently, Washington Township is conducting additional investigations at the VTC site and the results may or may not identify other areas of contamination. As for the supposition that VTC operators piped the liquids to the AC1 hotspot area (PVAC106), it is unclear to the EPA why or how such discharges would be directed to an area at least 20 feet higher in elevation than either the VTC site or the AC1 basin.

38) ***Page 393, Section 5.9.34*** - The Washington Mechanical property is located northeast or upgradient of the former ANC property. As reported in the RI, 130 ppb of TCE was found in groundwater at this location. Given its distance from the former ANC property, EPA can not attempt to dismiss this finding by alluding to ground water mounding. Therefore EPA simply ignores it. Again, the data clearly demonstrates that TCE is entering the Site groundwater from upgradient of the former ANC location.

EPA Response: The groundwater concentration for TCE was provided by the NJDEP from the late 1990s and the well was out of service when EPA arrived in 2002 to resample it. No confirmation of the single groundwater analysis has been performed. EPA had completed five borings to depth of 15 ft at the facility to identify a TCE source in the soils. No TCE was detected, nor was a source identified. The mounding comment was addressed in EPA's response to comment 36.

39) ***Page 405-406, last paragraph on p. 405 and first paragraph on p. 406*** - EPA reports that it found TCE in nine of twenty sediment samples from Pohatcong and Shabbecong Creeks and in seven of twenty water samples from these creeks. EPA also reports that there is no discernible pattern to these detections. Neither of these creeks is near the former ANC property. Further, the distribution of detection speaks to the possibility of multiple TCE sources as opposed to one source. EPA has made no attempt to analyze these data to determine if the distribution is indicative of additional source areas.

EPA Response: The extensive distribution of groundwater contaminated with primarily TCE and PCE does not rule out the possibility of other relatively minor sources of this contamination. However, there were only a limited number of identified locations where contamination in both soils and groundwater occur, which were considered to define a source area. Based on the contaminant concentrations identified in soil and groundwater in the ANC/AC1 area, this has been identified as the primary source area for TCE. Likewise, concentrations of PCE in the soils and groundwater at LNL/MVS/TVN are considered the contributory sources of contamination.

40) ***Page 412, second bullet*** - EPA states that PVAC106 is located near the upgradient property boundary of AC1 with ANC. The analysis of groundwater flow by EPA indicates that flow is from the northeast to the southwest. Therefore, since AC1 is about 10 degrees east of south from the former ANC property, AC1 is more accurately described as side-gradient from ANC. Portions of the ANC property are upslope from AC1, but the sample location in question is actually on the Norfolk Southern Railroad property and is downslope from AC1, ANC and the Warren Lumber Yard. EPA's continued use of inaccurate descriptions of the local properties and topography (e.g., assigning this sample to AC1 when it is located on the railroad property) provides a confusing picture of the data. It also leads to the incorporation of incorrect conclusions in the RI/FS and Proposed Plan.

EPA Response: The sample location in question is located near the boundary between the ANC site (on the railroad spur that exclusively serviced the ANC facility) and the AC1 site, and is accurately shown in the associated figures. The sample location is located down-slope from the ANC site, but is up-slope from the AC1 area and is separated from the WLY site by the elevated

railroad spur that is associated with the ANC site. See also EPA's responses to comments 9 and 20.

41) ***Page 412, first full paragraph*** - EPA either fails to understand or misrepresents the soil data collected at AOC 17 adjacent to the former ANC property as part of the NJDEP Industrial Site Recovery Act (ISRA) investigation. TCE was detected in one sample at a concentration above the most stringent NJDEP cleanup criterion. Subsequent excavations in the area removed this small area of soil contamination that was at a depth of about 8.5 feet below grade. Post-excavation samples collected at about 10 feet below grade showed no evidence of contamination and the area was given a designation of no further action (NFA) for soils by the NJDEP. This area has been fully characterized and remediated and is clearly not a source of TCE contamination to the groundwater. Despite the EPA's incorrect description by EPA in this paragraph of the contamination that was remediated in this area, EPA apparently agrees that this is not a source because it has not been included as one of the source areas evaluated in the FS or requiring remedial action in the Proposed Plan.

EPA Response: It is EPA's understanding that the NJDEP is not satisfied that the historically identified TCE contamination within ANC's AOC-17 has been fully remediated. However, the concern for how this contamination reached this area has not been addressed. This is one of the locations where early site plans for the facility indicate the presence of a potential wastewater discharge point, that is currently reportedly used as an outfall for stormwater runoff that the EPA had sampled after a rain event, in which TCE was detected from in the effluent from the discharge pipe at this location. This further substantiates former TCE usage at the plant. Soil samples collected along the surface drainage route of this effluent contain TCE concentrations that exceed NJDEP's IGWSCC. This area has been identified as remedial target area ANC B in the Feasibility Study. See also EPA's response to comment 28; the clean-zone beneath the excavation was based on limited sampling of only a few feet beyond the excavation depth, in this case, only 1.5 feet, when there is approximately 100 feet of soil column to groundwater, and therefore, the sampling was too limited and shallow, to confirm that contamination did not extend further. See EPA's responses to comments 14 and 15. This area will be investigated further as part of EPA's supplemental soils investigation.

42) ***Page 412, last full paragraph*** - EPA concludes that stormwater flow from the former ANC facility likely introduced TCE into the supposed AC1 source area because the highest TCE concentrations were detected in samples (e.g., PVAC106 and PVANC26) collected from a drainage swale between the former ANC property and AC1. As previously noted, these samples are not in a drainage swale and are not between the former ANC property and AC1. They are located in a flat lying area, not a swale, on the Norfolk Southern property between Warren Lumber Yard and Vikon Tile to the west and the former ANC and AC1 to the east. The conclusion that TCE originated from the ANC facility based on the location of the elevated TCE concentrations in soil on the railroad property has no technical merit. If the contamination was derived from stormwater drainage from the former ANC property, TCE would be detected at significant concentrations in the soil on the former ANC property between the storm water outfall and the location on the railroad property where elevated concentrations of TCE were detected. Since TCE has only been detected at trace concentrations or not detected at all in samples collected on this

portion of the former ANC property, the proposed scenario for the introduction of TCE to AC1 is not supported by the facts. The facts suggest that dumping on the railroad is a more likely explanation for the distribution of TCE in the soils.

EPA Response: The soil samples were collected from an area that is a shallow, trough-like depression that gently slopes down from the ANC facility to the AC1 site. This feature, or swale, is readily identified both on the ground and from aerial photographs. See also EPA's responses to comments 9, 12, 20, 22, 23, 30 and 32. This area was created by the rail spur that exclusively served the ANC facility and is topographically higher than the surrounding PSAs (WLY, VTC, AC1) and topographically lower than the ANC facility. The facts are that TCE was detected at the ANC facility at concentrations that required remediation, that TCE was found being actively discharged from an ANC facility pipe in the direction of AC1, and that records of potential dumping along the ANC-owned property can not be substantiated. As the rail spur in question exclusively served the ANC facility and is owned by PPPI and its predecessors at the property, any potential dumping on the rail line would likely be associated with operations at the facility.

43) ***Page 412, last full paragraph*** - The sample identified as PVANC29 appears to be incorrectly designated. The actual sample with the concentration reported here is PVANC49.

EPA Response: The sample designation was in error. It was PVANC49.

44) ***Page 413, last paragraph*** - The suggested scenario of contamination originating through stormwater flow from the former ANC facility is not supported by the data collected at the former ANC property. Sampling in the areas of the former ANC facility immediately downslope of stormwater outfalls shows that TCE was present in trace concentrations or not present at all in soils in this portion of the former ANC facility. As EPA acknowledges in its discussion of possible contaminant migration in the environment, it is technically infeasible for TCE in stormwater to flow over soils without a significant portion of the TCE migrating downward into the soil and being adsorbed. Clearly, if the soil on the railroad property retained TCE at elevated concentrations, soil in the upslope areas that are assumed to be the source of the TCE would also have retained significant TCE concentrations. Therefore, the absence of significant TCE in the soils where stormwater flowed at the former ANC facility is strong evidence that the TCE on the railroad property did not originate on the former ANC property as EPA assumes.

EPA Response: During the RI, EPA noted that the discharge structure (outfall) was composed of relatively fresh concrete. Also, the channel from the discharge structure contained rip-rap material. These observations suggest a possibility that the stormwater channel in this area was modified. Although PPPI and ANC have not provided detailed drawings of these structures, EPA recognizes that modifications may alter the historic distribution of TCE in the soils, such that the area is no longer representative of unaltered conditions. TCE being detected in soils at the ANC facility (AOC7) along the railroad spur adjacent to the main building is strong evidence that TCE was used at the ANC facility and TCE being detected in water currently discharging from the ANC facility is strong evidence of a connection to the discharge at the stormwater outfalls.

45) ***Page 414, third full paragraph*** - EPA concedes that it is likely that there is a source of TCE located upgradient of the former ANC facility, but insists on arbitrarily stating that the source is minor based on the limited groundwater data cited in this paragraph. However, the Agency fails to note that TCE was detected in ground water samples upgradient of the former ANC facility at concentrations as high as 130 and 230 ug/kg. These concentrations are of a similar magnitude to those detected at and near the former ANC site and are generally higher than those detected at the municipal drinking water well (Dale Street Well) that is downgradient of the area. In its failure to mention the higher concentrations of TCE detected in these wells and its focus on one relatively low concentration, EPA misrepresents the data to skew the results to fit its preordained conclusion that the upgradient sources are minor. The Agency also attempts to dismiss the presence of elevated concentrations of TCE on the property immediately upgradient to the former ANC property with an unsubstantiated argument that the ANC injection well caused contamination to flow upgradient to these wells. EPA does not provide any technical support for this argument and its own limited modeling data do not support it. Limited modeling conducted by Environ indicates that the mounding effect from the ANC injection well is insufficient to cause migration of contamination to these upgradient wells from the former ANC property (See Exhibit 1 hereto).

EPA Response: See EPA's response to comment 38. EPA acknowledges the TCE results from groundwater sampling by the NJDEP on the properties north of ANC. However, these concentrations have not been confirmed through subsequent testing, and a soil investigation at the Washington Mechanical PSA did not identify contamination in the soil. In addition, based on EPA's modeling efforts, the groundwater mounding produced at the ANC injection well is capable of distributing contaminated water to the VAN wells. See EPA's response to comment 36.

46) ***Pages 434 and 435, Figures 5-7 and 5-8*** - In these figures, EPA provides TCE results for ground water samples that were ostensibly collected in 2000 and 2002. However, not all of the data on each figure was collected in the year stated on the figure. Some of the data was collected as early as 1999. Since ground water is not static and concentrations may change over time, each result should be presented with its correct date. Data from one year should not be used to characterize conditions during other years.

EPA Response: Residential wells were sampled for the first time during the RI during the Summer of 1999. The analytical results for these residential wells were combined with the results of existing and newly installed monitoring wells sampled during the Summer of 2000 to produce Figure 5-6. Groundwater analytical results used on Figure 5-7 were obtained from existing monitoring wells sampled in January 2002 and residential and newly installed monitoring wells in June 2002. Considering that the position of the isoconcentration contours in both time-series are the same, and the TCE concentrations do not appreciably change across the aquifer, the concentration gradient appears stable and the use of these data sets in this manner is accurate.

47) ***Page 444*** - The habitat description is limited to a listing of expected species throughout the Upper Delaware Watershed. First, for an ecological risk assessment of this scope with the diversity of areas, a habitat characterization completed in the office is insufficient. Field reconnaissance and species/habitat checklists should have been completed. Second, the

site-specific habitat characteristics turn out to be ultimately important for characterizing the potential of soil exposures around the developed industrial facilities. Therefore, descriptions of the habitat areas and ecological setting around each of the PSAs included in the assessment should be included.

EPA Response: As noted in the RI, the habitat characterization for this site was not limited to a desk top study. Detailed ecological characterizations of all habitats within the PVGCS would be informative; however, this is impractical to do for a 8.75 square mile area. Furthermore, as stated, the purpose of this study was to investigate chlorinated VOC contamination in groundwater. Neither groundwater as a media nor VOCs are typically considered as significant for ecological receptors based on a lack of complete exposure pathways and the fate and transport properties associated with VOCs. Therefore the need to characterize all habitats and receptors was not considered essential. Where needed, however, field surveys were completed to evaluate the PSAs and any down gradient habitat that was considered to be ecologically relevant. A reconnaissance of wetlands and potential habitat for endangered species was also completed.

48) ***Page 445*** - Screening of groundwater as an exposure medium for ecological receptors should be eliminated. As the text points out, groundwater is only relevant for ecological receptors where it can be discharged to surface water and potentially affect sediment. Where direct evaluation of surface water and sediment is included, as in this assessment, potential groundwater discharges are accounted for and consideration of groundwater as a separate, ecological exposure medium is unwarranted.

EPA Response: As this is a conservative screening level risk assessment, all potential pathways are evaluated. Where groundwater is known or suspected to discharge to surface water, groundwater concentrations are screened against surface water criteria to determine the need for further investigation. Surface water and sediment samples were collected where outfalls were noted and therefore the sediment and surface water data used in this screening ecological risk assessment (SERA) evaluated potential risk due to surface water runoff. Groundwater may discharge to surface water at numerous locations in the study area that were not evaluated using surface water and sediment data. Therefore groundwater data was screened as a means of identifying potential problem areas.

49) ***Page 448*** - Data should be grounded and evaluated based on contiguous or linked ecologically relevant habitat units, not the artificial boundaries of the PSAs. EPA should re-do the RI ecological assessment to reflect the actual Site environment.

EPA Response: As noted in the SERA, data was evaluated where relevant ecological habitat was present near the PSAs. If the SERA indicated a significant impact to ecological receptors, an evaluation of all linked or contiguous habitats would be completed as part of a baseline ecological risk assessment (BERA). At the screening level, the approach was focused on identifying whether potential risk was present. Based on the media of concern and the primary class of contaminants (VOCs), it was not necessary to evaluate entire habitats until some risk could be identified.

50) ***Page 449, second to last paragraph*** - EPA states that Figure 6-5 identifies 12 sampling locations along Shabbecong and Pohatcong Creeks that are included for evaluation and three discharge locations associated with PSAs, only one of which is pertinent to the former ANC facility. However, Figure 6-5 actually shows 20 samples which are classified for inclusion in the "SAC" grouping for surface water and sediment and no locations classified for ANC or other PSA groupings are shown. Further, the sediment and surface water tables developed for the SAC area do not match either the text or the figure since 8 samples are included in this category and analyzed. The former ANC facility is located almost a mile from a surface water body and it is not appropriate to specify a data grouping as "ANC Surface Water" based on the locations actually sampled (e.g., stormwater drain outfalls). The specific samples included in this category are not identified, though there are apparently 5 samples according to Table ERA-14. The samples included in each grouping should be clearly specified. These entries in the RI assessment need to be clarified and corrected.

EPA Response: Comment noted. The text on page 6-11 and Figure 6-5 describes more samples that were used in the different risk screening tables because for each area a subset of the entire list was used. As described on page 6-12, the specific samples groupings used to complete the specific SERA tables are provided in Table ERA-5. Figure 6-5 does not indicate the locations of the samples collected on the ANC property. The location of the ANC samples are presented on figure ANC-1.

51) ***Page 449, last paragraph*** - EPA states that seven PSAs are included for evaluation, however only six are subsequently listed. No explanation is given for this discrepancy.

EPA Response: Comment noted. The number 7 in the text was a typographical error, the six PSAs listed are correct.

52) ***Page 450*** - If duplicate samples meet data quality and QC objectives as actual duplicates, the resultant detected values should be averaged. Selecting one of these values as EPA has done, contradicts the QC premise that duplicate measurements reflect sample handling and measurement uncertainties. Likewise, where both of the duplicates are "non-detects," the detection limits should be similar and should be averaged. If detection limits vary widely for duplicate samples, this is an indication that the samples may not meet QC requirements and data validation should be revisited.

EPA Response: For the purposes of the conservative SERA process, the higher of the two duplicate values is used. This use of the duplicate pairs is separate from the data validation process and is an approach used by EPA in the screening process. Where the duplicate pair are both non-detect values, the detection limits did not vary widely and the conservative approach of using the higher of the two detection limits was followed.

53) ***Page 452*** - The specification that ecological risk considerations beyond initial screening are limited to chlorinated VOCs is 1) not consistent with EPA guidance, 2) ecologically inappropriate, and 3) not, in fact, followed in the assessment. First, EPA guidance does not make provision for selecting ecological risk chemicals of potential concern (hereinafter "COPCs") on the basis of

chemical class (i.e., chlorinated VOCs), or eliminating other constituents identified as potentially significant in screening due simply to their chemical class (e.g., metals and PAHs). It is possible that metals exposure at some of the PSAs, which are developed industrial facilities with disturbed habitat, could ultimately be characterized as representing a limited population risk. However, per EPA guidance, such a determination must be made location-by-location based on site-specific details after Step 3 of the ecological risk process, not by summarily eliminating, by virtue of their chemical class, COPCs that screen into the process.

Second, in comparison to some of the metals and PAHs eliminated from further consideration, chlorinated VOCs are typically considered of very limited ecological relevance. Due to their volatility, they are not persistent. They are also extensively metabolized and are not transported through the food chain. Some of the very constituents subjectively removed from consideration are much more likely to have been toxicologically relevant.

Third, though the section specifies that only chlorinated VOCs are considered beyond initial screening and the subsequent risk characterization text discusses only the chlorinated VOCs, in actuality metals, PAHs and other constituents were included in the risk assessment tables for quantitative risk estimation. The analyses were completed and make it readily apparent that the hazard quotients for constituents other than chlorinated VOCs dominate the potential risks and would require the most involved subsequent consideration. Selecting only the relatively low chlorinated VOC risks for emphasis in the body of the RI document is scientifically inappropriate based on the calculated risk estimates and appears to be an attempt to substantiate the pre-determined perception that chlorinated VOCs represent a uniformly significant issue in the Pohatcong Valley. The preliminary ecological risk assessment results actually demonstrate that there are differing constituents and differing habitat/population characteristics across the PSAs and evaluation areas. The Agency RI conclusions should not try to avoid such complexities in order to substantiate the expected "effectiveness" of the proposed remedy for risk management.

EPA Response: It is correct that limiting the risk assessment to one class of compounds is generally not consistent with EPA guidance. However, the original intent of this RI was to evaluate chlorinated VOCs in groundwater for the Pohatcong study area. Therefore the ecological risk assessment completed as part of this RI focused on VOCs and the primary pathway of groundwater discharging to surface water. This assessment only made conclusions concerning chlorinated VOCs. Information regarding risks identified for other contaminants has been provided to other agencies for review and action, if appropriate.

EPA is aware that VOCs have little relevance as an ecological contaminant of concern. This was confirmed as expected by the SERA results. EPA is also aware that metals and PAHs are of more concern from an ecotoxicological perspective.

There was never a pre-determined perception that chlorinated VOCs represent a significant issue and risk to ecological receptors in the Pohatcong Valley. VOCs in groundwater are not typically a risk to ecological receptors because of a limited exposure pathway and the fate and transport properties of these compounds. Results of the SERA indicated that the concentrations of VOCs in

groundwater at this site are not posing an unacceptable risk to ecological receptors. However, per EPA direction, a SERA was completed as part of this RI for the contaminants of concern that are severely impacting the regional drinking water aquifer. However, it should be noted that the limited metals and PAH contamination discovered in groundwater during this study will be monitored as part of the groundwater remedy for this Site.

54) ***Page 473, et. seq.*** - In the summary statistic tables, the means computed as representative of average concentrations in the exposure unit are frequently much higher than the maximum concentrations found in the same area. This is statistically incongruous and the mean value should be "capped" at the maximum concentration. If this situation is a result of data quality problems, these should be acknowledged and discussed.

EPA Response: In the summary statistic tables, there are instances where the value in the mean column is much higher than the value in the maximum column. The concentration shown in the maximum column is based on the highest detected value. The concentration in the mean column is the calculated mean concentration of all samples, including the detected values and ½ the detection limit for the non-detected values. In some cases, the detection limits are higher than detected values in other samples. Therefore, the calculated mean concentration is higher than the actual maximum detected concentration. For example, if you have four samples, with two detections of 5 and 10 and two samples that were non-detect at 100, then the maximum detected concentrations would be 10, but your mean concentration would be 53.75. It should be noted that this is not indicative of data quality problems, just high detection limits in some samples due to the need for diluting the samples because of elevated concentrations of other constituents, or detections that were below the minimum detection limit.

The tables containing the maximum detected column represents the maximum detected value; there may be data points with higher values qualified as "U" (non-detected) due to detection limits, and thus the mean value may be higher than the maximum value. It should be noted that the 95% UCL was used as the exposure concentration, however, if it was greater than the maximum detected value, the maximum detected value was used as the exposure concentration.

55) ***Page 533*** - The "maximum HQs" shown in Table ERA-27, characterized as relating to the former ANC facility surface water, are computed incorrectly based on the maximum and screening values shown in the table. Further and as stated previously in Comment 19, there are no surface waters per se on the former ANC property.

EPA Response: In the referenced table, the HQ was calculated using ½ of the detection limit (DL) when the maximum value was qualified with a "U" (non-detected). The HQs for DEHP, and di-n-octylphalate, shown on the table are incorrect, and should be 33.3 and 0.67, respectively. See also EPA's response to comment 19.

56) ***Page 542*** - The evaluation of groundwater in the human health risk assessment is specifically constructed to include only those wells with TCE and/or PCE concentrations greater than 1 ppb. It is inappropriate to exclude, as a matter of the study design, wells with low

concentrations of constituents from analysis. This manipulation serves to increase the concentrations within the groundwater which are inappropriately viewed as "representative."

EPA Response: As written, the data only included all wells that contained TCE or PCE levels greater than 1 ppb. The identification of the nature and extent of contamination was based on 1 ppb (the NJ drinking water standard), and any well within the plume area with concentrations above 1ppb was used in the exposure point concentration calculations. It is appropriate to evaluate risks associated with the contaminant plume and not the whole Pohatcong Valley. It would not be appropriate to use data from outside the plume since this would dilute the concentrations associated with the groundwater plume. It is standard operating procedure to look at areas where concentrations are at and above the health based risk level for drinking water, in this case 1ppb of TCE and 1ppb of PCE.

57) ***Page 542*** - Evaluation of individual domestic supply wells for which alternative water supplies have been provided through the typical Superfund risk assessment method is inappropriate from a technical perspective and inconsistent with EPA guidance. These wells should be excluded from the area-wide hypothetical risk evaluation and, if their use remains a question, they should be evaluated by the responsible public health authorities using relevant state drinking water criteria. Individual drinking water wells represent specific exposures to identifiable individuals, not hypothetical exposure scenarios to an unknown population, and they should be addressed accordingly. Including them in a Superfund-type risk assessment misleads reviewers, particularly those who might be the users of such wells, to conclude that the health risks to particular individuals can be determined through this type of study. Superfund risk assessments characterize hypothetical risks to populations assuming certain consistent lifetime or long-term exposure characteristics and the receptors reflect the most sensitive individuals to potential effects. This is not an individualized risk characterization. Domestic drinking water is the province of real health professionals that can evaluate immediate exposures and make short-term recommendations, not environmental cleanup specialists that use risk assessment methods designed to characterize the probability of risks to a population and develop 50-year cleanup plans. EPA's site investigation team should not play doctor with regard to the health of individuals and should not attempt to provide reassurances, or demonstrate immediate health threats, using the Superfund risk assessment paradigm.

EPA Response: The commenter indicates that evaluating individual domestic supply wells using standard Superfund methodology is inappropriate and inconsistent with USEPA guidance. According to the USEPA guidance document entitled "Risk Assessment Guidance for Superfund (RAGS) Part A" it is stated on page 6-24 that "[i]n other instances, as when the sampling point is an exposure point (e.g., when the sample is from an existing drinking water well) it may not be appropriate to group samples at all, but may be most appropriate to treat the sample data separately when estimating intakes." EPA assessed the potential risk and hazards to the generalized plume using monitoring well data, thus, it was important and appropriate to treat the private well samples separately when estimating intakes and associated risks and hazards.

The Agency is responsible for evaluating the potential health impacts from environmental

pollution and for reporting these findings to the public. The Agency has a team of experts from a variety of disciplines, including environmental toxicology, that are dedicated to this project and are highly trained and experienced in evaluating the potential for health effects from environmental pollution. In addition, Agency staff interact with other federal and state agencies, as well as other experts in specific fields when appropriate.

58) ***Page 545*** - The calculation of risk estimates on the assumption that any remedy emerging from site investigation has not yet been completed is consistent with EPA guidance on baseline risk assessment. However, there is an important caveat, that should be clarified and discussed with regard to sampling data that are included in the assessment. Risk assessments must reflect current conditions. Results from areas of soil that were removed as part of previous actions must be excluded since, by virtue of being removed, it is not possible for ongoing, long-term exposure to occur. The text should be expanded to clarify, and samples should be excluded as necessary, to specify that the risk assessment does not assume subsequent remedial actions are to be implemented, and that the risk assessment does not include results from soil, sediment or groundwater that no longer exist in the area.

EPA Response: Results from areas of soil that have been removed during previous actions are not included in the risk assessment. The risk assessment is based on existing data and site conditions, it does not assume subsequent remedial actions will be implemented.

59) ***Page 546*** - USEPA Data Quality Objectives (hereinafter "DQOs") for risk assessment support excluding screening level groundwater results obtained from temporary wellpoints, particularly where extensive data from properly constructed wells is available. Accordingly, excluding results from temporary wellpoints was correct, since higher data quality results are available to supersede the screening data. However, selectively retaining the screening result from one single wellpoint (PVLNL04-WP-1) simply because it is the highest number noted is not appropriate and flies in the face of the DQO requirements. Taking the position that wellpoint data is of insufficient quality except for the very highest number available is not scientifically defensible, represents a self-contradictory approach, and is inconsistent with EPA requirements regarding DQOs. This sample should be excluded along with the rest of the wellpoint data.

EPA Response: EPA agrees that temporary wellpoint data is typically not used for risk assessment due to data quality. However, there are no permanent wells at that same location, and since it was the highest detected value, it was included so as to not miss any potential contamination. Additionally, not including this well point data does not make any difference in the results of the HHRA . The exposure point concentration (EPC) for PCE with the well point data included is 380 ug/L, eliminating the well point data results in an EPC of 58.6 ug/L. PCE would remain a risk driver at this concentration.

60) ***Page 551 and 552*** - The assumption that subsurface soil could be an exposure medium following disturbance of the land surface under certain future use scenarios is used in some risk assessments. However, the hypothetical future exposure is actually characterized as mixing of current surface and subsurface soil such that some of the eventual surface soil was derived from

deeper intervals. EPA guidance makes clear that it is soil mixing, not just current subsurface conditions that is relevant to future exposures. Accordingly, the proper grouping of soils data to represent future mixed soil is to include all soil samples from current land surface to 10 feet below ground surface and to calculate exposure point concentrations from the set of data representing this entire soil column. The EPA's RI approach of calculating risks for future-use scenarios using surface soil and subsurface soil separately should be revised accordingly.

The future soil exposure scenarios should be computed using a single, mixed soil set of exposure point concentrations instead of duplicating the calculations for two different soil intervals. In addition to obtaining a better representation of possible conditions after hypothetical soil disturbance and mixing and making future risks clearer, this change will serve to reduce the number of separate risk tables that need to be prepared and considered. Since the surface soil conditions are accounted for in the current-use scenarios, the change to using just a mixed soil category for the future use scenarios will not result in the loss of any analyses or provide an inadequate characterization of risk associated with soil.

EPA Response: The subsurface soil and surface soil were evaluated separately to identify, which, if either, of the soil groupings poses a risk, to better target remedial actions, if necessary. Both surface soil and subsurface soil exceed acceptable levels, therefore, evaluating them as one data grouping, or as two separate data groupings does not alter the results of the risk assessment.

61) ***Page 553*** - The computation of the site-specific subchronic volitization factors (VFs) and particle emission factors (PEFs) should be corrected to reflect the appropriate time interval per the cited EPA guidance. Equations 5-5 and 5-14 of the relevant 2002 EPA guidance document (SSG Supplemental Guidance) specify that the input value "T" should be the "Total time over which construction occurs," in seconds. Based on table footnotes, the current site-specific VFs and PEFs were apparently computed using the number of seconds in 8 hours over 180 days. Both the number of days and hours per day are inappropriate. The construction worker scenarios specify an Exposure Duration of 1 year. As a protective estimate, it is reasonable to anticipate that construction projects are better bounded by a 1 year assumption than a 6 month assumption. Also, as a simple matter of consistency, if the scenario is based on a duration of 1 year, this value should also be used in the VF and PEF computation.

Next, the VF and PEF are characterizations of flux from the soil to the air, NOT direct characterizations of exposure concentration. In other words, the particles or vapors are being emitted at some rate estimated by the VF and PEF dependent upon the characteristics of the impacted area, site activities, wind, etc. This emission flux and the corresponding transfer of constituents to the air occurs regardless of the presence of a receptor at a given time. So, calculating the site-specific VFs and PEFs using a time input of 8 hours per day is not consistent with the underlying basis for these metrics. The correct basis is using the number of seconds in 24 hours for each day of the assumed scenario.

Site-specific VFs and PEFs are calculated in a number of tables (e.g. Appendix R, Table 7-103, 7-104, 7-105, and 7-109) and in each case, the input value T should be revised from 5.2 X 106

seconds to 3.2 X 107 seconds (60 X 60 X 24 X 365).

EPA Response: The commentary is correct; the number of hours per day to calculate volitization factor (VF) and particulate emission factor (PEF) should be 24 hours per day. However, the number of days used in the risk assessment is correct, the EF for all construction worker scenarios is 180 days/year, assuming active construction for the worker occurs for ½ the year. This is as per EPA's standard risk characterization guidance, and has been applied correctly as per EPA's Risk Assessment Guidance for Superfund, Part E (RAGS). Additionally, current risk assessment guidance suggests using 180 days per year for a construction worker. It should be noted that changing the number of hours per day from 8 to 24 does not change the overall results of the risk assessment.

62) ***Page 553, fifth paragraph*** - The text specifies that exposure point concentrations (hereinafter "EPCs") were calculated as 95% UCL of the arithmetic mean concentrations. The EPC tables indicate that the underlying distributions were either log normal or not normal in many cases. In such circumstances, the statistic derived is not the confidence limit on an arithmetic mean. This should be corrected by revising the text to say the "95% UCL of the mean."

EPA Response: There is only one correct way to calculate a 95% UCL. A 95% UCL of the geometric mean is not used to estimate the EPC term. None of the guidance documents suggest/recommend the use of a 95% UCL of geometric mean. The 95% UCL of the arithmetic mean (whether population is normal, log normal, or some other nonparametric distribution) is always used to estimate the EPC. In the general environmental literature, by default, a 95% UCL of the mean represents 95% UCL for the population arithmetic mean.

63) ***Page 553, groundwater EPCs*** - EPCs for groundwater should be based upon only the most recent result available for each well in an exposure unit. Sequential groundwater samples from the same well, particularly when they are obtained at intervals of several years, as is the case in this risk assessment, reflect changes in groundwater conditions. Older results are superseded by newer results. EPA guidance directs that baseline risk assessments be completed based on a current snapshot of conditions. Averaging current groundwater concentrations with older data (data that reflects conditions to which receptors can no longer be exposed) inappropriately characterizes current conditions. Based on the identification of samples included in the risk assessment shown in Table HHRA-1, it appears that multiple results reflecting conditions at different times have been included for some wells. The data included in EPC calculations should be updated to remove outdated results, ensuring that the most recent results from each well are used.

EPA Response: Groundwater data collected within a period of two to three years was used to calculate the EPCs. This data was evaluated prior to use to confirm that the concentrations are relatively stable and there is no decreasing or increasing concentration trend. Therefore, this data represents a correct "snapshot" of the groundwater concentrations.

64) ***Page 554, Data Qualifiers*** - Additional description and substantiation of the handling of "B" qualifiers should be provided and the footnotes for the various tables in which this qualifier is defined should be reviewed and made consistent. Specification, and cross-referenced documentation in the appropriate appendix, must be provided regarding the source of the "B" qualifiers listed. This same qualifier, unfortunately, may be assigned by two different sources with importantly different meanings. The "B" qualifier assigned by a data validator, per EPA guidance, is used to indicate an estimated concentration for an inorganic analyte. Data assigned the "B" qualifier for this reason are properly included in EPC computation. However, the "B" qualifier is also a commonly assigned laboratory qualifier used to indicate the presence of contamination in the blank. Inorganic results where the metals are present due substantially to contamination in the laboratory must be excluded from quantitative risk assessment per EPA guidance. Since the inclusion/exclusion criteria per EPA DQOs for handling "B" qualified data is complex, this should be described in detail. Numerous groundwater result tables and some soil tables included in the risk assessment appendix define the "B" qualifier in the table footnotes as indicating blank contamination. Other tables, mostly soil tables, define the "B" qualifier as indicating estimated concentrations for metals. If the results are actually indicative of blank contamination, such a footnote is importantly misleading regarding data quality. The qualifier should be defined consistently and data qualified by the laboratory with a "B" should not be included without proper consideration of DQO requirements for results with blank contamination.

Risks calculated on the basis of metals present due to laboratory contamination, which appear to be reflected in some of the risk tables, should be made very clear to risk managers so that they can be given appropriate weight in remedial decisions. For example, risks were calculated for residential well PVDOM01 (Appendix R, Table 2.1) based on arsenic being detected in one sample, 5 times less than the current drinking water standard (25 times less than the then current drinking water standard) and "B" qualified. The data qualifier is clearly significant in situations such as this where the non-specialist reader may readily misunderstand the significance of a hypothetical calculated risk estimate and may not understand that the water meets carefully considered drinking water standards.

Also, in Appendix R-Table 3.2, the "Q" qualifier appears but is not defined. This is also a qualifier that has multiple definitions and it should be both defined and its handling per DQO requirements should be made clear.

EPA Response: As stated in the HHRA, all data used were validated, therefore, the B qualifier for inorganic data is indicative of estimated concentrations for inorganic constituents. The "B" qualified data (estimated concentrations) were correctly used in the risk assessment as if they were unqualified detected concentrations.

The laboratory's definition of the JQ qualifier used in 2002 is, "[t]he analyte was not detected at or above the reporting limit, but the reporting limit is estimated." The Q qualifier is a laboratory qualifier and was incorrectly included in the table. The data were validated, and therefore, only the data validation qualifier should have been shown. The correct data qualifier for the sample in question was a J, indicating estimated value, as defined in the footnotes on the table. To support

the conservative DQO requirements for this project, the result was used in the risk assessment as an estimated concentration.

65) ***Page 554, Estimation of Chemical Intakes*** - The soil-to-skin adherence factor (hereinafter "SSAFs") used in the dermal exposure route for the youth recreation receptor exposed to sediment from Pohatcong and Shabbecong Creeks is a value specifically disavowed by the cited EPA guidance document because it inappropriately overestimates potential risks. The SSAF selected is approximately 100 to 500 times greater than typical SSAFs used for risk estimation and should be revised.

EPA's RAGS Part E Guidance (2001) for dermal exposure states, "Information on soil adherence values for the children-in-mud scenario is provided to illustrate the range of values for this type of activity. However, the application of these data to the dermal dose equations in this guidance may result in a significant overestimation of dermal risk (p. 3-16)." The scenario identified, and currently used for the creek sediment SSAF is based on characterizing the amount of mud, derived from soil, not sediment, that might adhere and dry on a child's skin.

The risk assessment cites this guidance as the basis for characterizing the scenario, then selects the very SSAF that is specified not to be useful for quantitative risk estimation. The subsection in RAG Part E discussing the use of soil dermal exposure equations with sediment also points out that care should be taken regarding overestimating sediment adherence since much of the sediment that a wading receptor comes in contact with is subsequently washed away as they move through the water and does not adhere to the skin for sufficient time such that the predictions of dermal absorption reflected in the equations are relevant. Thus, the use of the inordinately high SSAF is, thus, particularly inappropriate for sediment exposure pathways.

There is an activity scenario listed in RAGS Part E, Exhibit 3-3, that is much more relevant to stream sediment exposures. The SSAF associated with reed gatherers, who wade through sediments in shallow water bodies, has been measured. The mean value of 0.3 mg/cm2 specified for this scenario is a reasonable maximal exposure input factor. RAGS Part E specifies that mean SSAF values for high exposure activities should be selected for RME scenarios. The reed gatherer scenario qualifies as a high exposure activity relative to the amount of extensive contact and adherence of long enough duration to produce absorption anticipated from a youth wading in these creeks. Using this value also appears appropriate relative to the assumptions used for soil exposures, since it remains higher than the SSAF used for soil adherence to child receptors.

Also note that on Appendix R, Tables 7.22 RME and 7.22 RME, the exposure medium that appears at the bottom of the table is erroneously listed as "Surface Water." The rest of the table refers to a sediment risk calculation.

EPA Response: The soil to skin adherence factor (SSAF) values used are consistent with the Dermal Guidance,. The guidance states that either a central tendency activity and a high-end AF should be selected, or a high-end activity and central tendency adherence factor (AF) should be selected. A high-end activity (child in mud) and a central tendency AF (23 instead of 231) were

used. Additionally, the entire text from the guidance document was not quoted in the comment. The entire text says "Information on soil adherence values for the children-in-mud scenario is provided to illustrate the range of values for this type of activity. However, the application of these data to the dermal dose equations in this guidance may result in a significant overestimation of dermal risk. Therefore, it is recommended that the 95th percentile AF values not be used in a quantitative dermal risk assessment. (p. 3-16)." EPA did not use the 95th percentile AF of 231 (which is the "disavowed value"). Dermal exposure is not a risk driver and no remedial actions are being taken for this pathway.

66) ***Page 561*** - Based on its risk assessment calculations, EPA concludes that the soils at the former ANC property do not present any unacceptable carcinogenic or non-carcinogenic risk given the current use of the property. Even under a residential use scenario, the only unacceptable risk levels found are related to metals that EPA believes are background conditions. Yet EPA is still seeking remediation of soils on the former ANC property. This inconsistency also applies to soils in AC1 which EPA assumes are on the former ANC property. EPA's approach is inconsistent with the NCP. Further, at other properties, such as Five Carp Company, LNL/Econowash and Modern Valet Services, where similar risk assessments results were developed, no soil remediation is proposed.

EPA Response: As described on page 542 of the RI, the soil samples collected from within the fenced area of ANC were evaluated for the ANC site risk assessment whereas the soil samples collected at the ANC site outside the fenced area were grouped with the samples from the AC1 and VTC for a trespasser scenario (Trespasser Area 1). Discussions and conclusions in the Section 6.2 relate this usage of the data, and should not be confused with the need for remediation. EPA has targeted the remediation of soils and groundwater on the former ANC property based on risk or exceedance of the selected remediation goals (i.e., NJDEP IGWSCC and GWQS). This same standard has been applied to all of the PSAs evaluated during the OU1 RI/FS within the Pohatcong Valley. As clearly stated up front in the EPA's June, 2005, RI, (see page 2), the RI performed at the Pohatcong Valley Groundwater Contamination site was a comprehensive investigation with the goal of determining the nature and extent of the TCE and PCE groundwater contamination and its sources. Specifically, page 2 of the RI states: Inclusion of the PVGCS on the NPL was based on the widespread detection of primarily tetrachloroethene (PCE) and trichloroethene (TCE) at levels that can be harmful to human health and the environment. The EPA initiated a Remedial Investigation (RI) within the OU1 study area to identify the sources of the site wide groundwater contamination and to assess the nature and extent of site wide contaminants.

The groundwater throughout a huge extent of the valley covering over 5 miles in length is contaminated with highly elevated levels of TCE and PCE, rendering this important drinking water resource to the entire area unusable without treatment. EPA was successful in delineating groundwater contamination in the OU1 Study Area and identifying specific soil sources of this contamination through extensive investigations which evaluated operations at over 100 potential source area facilities, and investigated soil and/or groundwater at 45 facilities. EPA will address the TCE and PCE groundwater contamination through the implementation of the selected remedy.

EPA prepared a comprehensive risk assessment for the Site, which is the basis for taking the selected remedial action. EPA's risk assessment analyzed all data collected during the RI, in accordance with EPA's Risk Assessment Guidance for Superfund, and the same standard has been applied throughout the Site and to all of the PSAs evaluated during the OU1 RI/FS within the Pohatcong Valley. As clearly stated in the RI and the Proposed Plan, the focus of the RI/FS is chlorinated VOCs, specifically TCE and PCE due to the extensive contamination of the regional drinking water aquifer. All of the PSAs, however, were evaluated for a full suite of VOCs, SVOCs, and metals. Since the contaminants of concern in the groundwater and soil are TCE and PCE, and the risk assessment demonstrated that risks posed by these contaminants were unacceptable in groundwater, EPA is selecting a remedy for groundwater in this action. EPA is presently focusing on the TCE and PCE groundwater contamination as part of this action, the soils source areas, as they pertain to the TCE and PCE contamination, will be addressed in a subsequent ROD after completion of a supplemental soils investigation. As pointed out by the above comment and in the RI, a number of other compounds were detected at certain facilities at levels posing unacceptable risks under EPA's guidance. Additional contaminants such as PAHs and arsenic have been found in the soils at various PSAs; however, they are not elevated in groundwater and have not historically impacted the public water supply wells. EPA will continue to monitor these contaminants as part of its groundwater remedy. EPA has targeted the remediation of groundwater at the Site based on risk or exceedance of the selected remediation goals for TCE and PCE (i.e., GWQS). PSAs with groundwater or soils that exceed the NJDEP IGWSCC or GWQS for non-chlorinated VOCs, SVOCs or metals, have been identified in Section 5.11 of the RI Report, and the risks have been calculated in the risk assessment. For each facility demonstrating an unacceptable risk due to contaminants other than TCE and PCE, EPA will provide the information to the property owner, as well as to local authorities.

67) ***Page 569, fourth full paragraph under heading Tung-Sol Tubing (TVN)*** - In this paragraph, EPA concludes that the carcinogenic risk to residents exposed to surface soils on this property is unacceptable due to PAH's and arsenic. This property is currently used for residential purposes. Yet, EPA does not propose any measures to address this unacceptable exposure risk.

EPA Response: See EPA's response to comment 66. EPA will provide the results of the RI and risk assessment for this facility to the property owner, as well as state and local authorities.

68) ***Page 570, under the heading Vikon Tile Corporation (VTC)*** - In the paragraphs making up this section of the risk assessment, EPA concludes that a resident's exposure to xylene levels in subsurface soils poses an unacceptable risk. Cadmium also poses an unacceptable exposure risk. The "RME carcinogenic risk" from PAH's and arsenic in the surface and subsurface soils also present unacceptable risks to future residential users. In addition, the non-carcinogenic risk to construction workers exposed to surface soils, subsurface soils and perched groundwater at Vikon Tile exceeds acceptable levels. EPA has not proposed any corrective measures for any of these conditions. Further, the presence of xylene may stem from past industrial solvent use on this property and may be indicative of onsite, as opposed to offsite, contributions to regional groundwater conditions. EPA simply ignores these soil conditions in its remedial conclusions.

EPA Response: See EPA's response to comment 66. EPA will provide the results of the RI and risk assessment for this facility to the property owner.

69) ***Page 571-572, under the heading Trespasser Area 1*** - In this section of the risk assessment, EPA found that no unacceptable exposure risk exists due to exposure to surface or subsurface soils in these areas, which include AC1 and ANC B.

EPA Response: Trespasser Area 1 includes only parts of ANC, and correct, no unacceptable exposure risk was identified.

70) ***Page 653, first full paragraph*** - EPA states that "solvents, such as TCE" were used in the manufacturing process at the former ANC plant and that a 1953 drawing shows that the reclaim line injecting ground water back into the aquifer may have been connected to floor drains. A thorough review of past plant practices indicates that toluene was the most commonly used solvent at the Site. Toluene is not a constituent of concern at the Site. In addition, none of the plant drawings shows a connection between the reclaim line and floor drains. The 1953 drawing indicates that several drain lines connected to the reclaim line were capped at the floor level for future use. Since the reclaim line returned non-contact cooling water to the aquifer, it is likely that these lines were set up for potential future use to convey non-contact cooling water from this area to the reclaim well. A 1966 drawing shows that these lines were in use at the that time and were used to discharge non-contact cooling water from air compressors to the reclaim well.

In the last two paragraphs of this page, EPA accurately describes the theoretical process of vertical and horizontal migration of COPCs. As EPA notes, in areas where COPCs were released along a drainage channel, "the COPCs would migrate laterally along the course of the channel and vertically through the base of the channel." Although there is no well-defined drainage channel in this area, this mechanism of migration would also apply to overland flow that is not through a channel. Therefore, if the EPA hypothesis that TCE was introduced through a drainage channel at AOC 16 on the former ANC property is correct, TCE should have migrated both vertically and horizontally through the soils in the area. Evidence of this migration should be seen in the presence of significant quantities of TCE in the fine-grained soils under the hypothetical discharge point (AOC 16) and in the areas downslope of AOC 16. However, the data collected by EPA and ANC both show that significant quantities of TCE are not present in soils below the AOC 16 outfall or in the area immediately downslope from the outfall. This is a direct contradiction of the EPA hypothesis and indicates that some other mechanism (such as direct discharge of TCE on the Norfolk Southern railroad property) is likely responsible for the TCE detected on the railroad property.

EPA Response: Regarding the current drainage route from AOC 16, trace amounts of TCE were detected but significant concentrations were not identified. The lack of significant contamination along this current route does not eliminate other possible routes of discharges in the past, including alternate alignments of surface water discharge and potential dumping along the railroad spur exclusively used to transport railcars to and from the western side of the ANC facility. In addition, at some point a connection existed between the drain lines and the reclaim line which returned

non-contact cooling water to the aquifer, it is likely that these lines were set up for potential future use to convey non-contact cooling water from this area to the reclaim well. A 1966 drawing shows that these lines were in use at that time and were used to discharge non-contact cooling water from air compressors to the reclaim well. An additional investigation will be performed to fully assess contamination related to the former ANC facility prior to selecting a soil remedy.

71) ***Page 653, second full paragraph*** - In the second full paragraph, EPA presents its theory for how storm drainage from the former ANC property impacted AC1 and the Warren Lumber property. Several surface water discharges are noted, though EPA sampled only three, and found TCE in only one. EPA detected TCE in PVANC49 at AOC 17. However, TCE was not detected in the samples from an outfall south of the former ANC facility (PVANC50 at AOC 16) and northwest at that facility (PVANC53 at AOC 18). (See page 155) EPA's statement that discharges from the western slope of the property contribute to TCE findings is pure speculation and not supported by the trace concentrations of TCE detected in the limited number of samples collected. Data associated with the drainage paths from the former ANC property does not support EPA's general conclusion or the more specific conclusion that AC1 is attributed to drainage from the former ANC property. Finally, the drain at AOC 17 is a storm drain, not a building drain as was assumed by EPA.

EPA Response: If the current TCE detections are any indication, then the historical TCE concentrations from these discharge pipes may have been substantially higher during the period TCE was used at the ANC facility. In early 2006, PPPI at NJDEP's request and under its oversight performed sampling underneath the building along piping runs, in the ANC C area that is located on the western side of the property. The preliminary results from this sampling confirmed the presence of TCE contamination well above NJ IGWSCC in both shallow and deep soil samples in a recently installed boring advanced to groundwater. These findings further support EPA's conclusion that this facility is a source of TCE groundwater contamination at the Site. This area will be investigated further as part of EPA's supplemental soils investigation. Based on EPA's understanding of the topography at the site, the conclusion that the PVAC106 sample is attributable to the drainage from the ANC site is supported by the data.

72) ***Page 654, first paragraph*** - EPA uses the New Jersey Impact to Ground Water Soil Cleanup Criterion (IGWSCC) as a basis for evaluating the potential for soil contamination to affect ground water quality. The IGWSCC values were developed by the NJDEP as generic criteria and are not based on a rigorous evaluation of risk or local geology. More accurate criteria can and should be developed on a case-by-case basis to evaluate the potential for impacts to ground water from soil contamination. These site-specific criteria should then be incorporated in any remedial decisions for OU1.

EPA Response: The selection of the NJDEP Ground Water Soil Cleanup Criterion (IGWSCC) for the Pohatcong Valley Superfund site was based on consultation between EPA and the NJDEP. The New Jersey IGWSCC numbers are considered to be protective of groundwater and have been consistently applied at numerous sites within EPA Region 2. It should also be noted that the PPPI recommended approach is not consistent with procedures used to develop cleanup numbers and

ARARS for VOCs, site specific criteria are developed on a case-by-case basis for metals contamination in soils, not VOCs, because specific site conditions (such as pH), greatly affect metals, but not VOCs such as TCE and PCE.

73) ***Page 656, first paragraph*** - EPA understates the significance of volatilization in surface waters. Any TCE that is discharged to surface waters is not likely to persist for any appreciable time period due to volatilization. This is pertinent to EPA's theory that surface drainage flow produced AC1, an area EPA assumes is 28,000 square feet and 100 feet deep.

EPA Response: Volatilization of TCE in surface water is dependant upon the initial concentration. TCE at high concentration in surface water would have a greater opportunity to migrate to the subsurface soils. During times when the ANC facility used TCE, the concentration of TCE in the discharge wastewater is likely to have been significantly higher than currently observed.

74) ***Page 656-657, Section 7-4*** - In these paragraphs on plume behavior, EPA summaries the complexities of flow, degradation, reductive dechlorination and chlorinated transformation and highlights the fact that these characteristics are variable within the plume. EPA's calculations of TCE contributions to the plume can not have taken into account the real complexities within an over 8.75 mile plume since data for relevant parameters such as carbon, dissolved oxygen and relevant ions does not exist for the large majority of that plume. For example, average transmissivity among the wells ranged from 0.02 ft2/day to 18,300 ft2/day and hydraulic conductivity ranged from 0.01 ft/day to 1405 ft/day. Further transmissivity values for different zones within wells 7 and 8 at Warren Lumber ranged four orders of magnitude. In addition, adequate stratigraphic and hydrogeologic information does not exist for much of the plume to allow such calculations to take place. EPA has done no dye tests, has not defined fracture zones and has performed only limited pumping tests. In fact EPA used data from one area of the aquifer and assumed it remained the same throughout the plume. EPA's calculations must be viewed as an oversimplified guess at best, and not an adequate basis for assuming source(s) or planning remedies.

EPA Response: Section 7.4 is intended to provide a regional description of plume behavior over its length from suspected source to distal downgradient areas. The heterogeneities described for aquifer characteristics in comment 74 have been taken out of context, and can occur at any site irregardless of geological setting, and they should not preclude attempts to characterize a contaminant plume. Sufficient study and analysis of the aquifer and its characteristics have been conducted in the selection of an appropriate remedy for this site. Contrary to the contention in the comment, this section did not include calculations of the TCE contributions to the plume.

75) ***Page 658, fourth paragraph*** - There is a typographical error. The phrase "sample data is" should be "sample data are."

EPA Response: The EPA acknowledges the typographical error.

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76) ***Page 658, fourth paragraph*** - There is a typographical error. The phrase "analytical data is" should be "analytical data are."

EPA Response: The EPA acknowledges the typographical error.

77) ***Page 658 - Section 7.5*** - EPA supposedly relied on two years of data (from 2000 and 2002 - not eight consecutive quarters of data) to evaluate the persistence of chlorinated VOCs in the groundwater beneath the Site. Based on those data, EPA concludes the plume is at a steady state with 310 pounds of TCE entering the ground water each year. Sampling data from two years is simply inadequate to make these kinds of declarations for a complex karst area, particularly when not all wells were sampled in each of the selected years. Further, the data relied upon was not actually collected in two years, but rather spans the period of 1999 through 2002.

In addition, data from the Dale Street well indicates that TCE concentrations are in fact decreasing over time. This contradicts EPA's concept of a steady state plume. EPA's other RI data confirm that the plume is not in a steady state. Again, EPA has ignored its own determinations about the complex nature of the hydrogeology here, as well as its own sampling data, and opted for a simplistic alternative. It is the Agency's unwavering supposition that 310 pounds of TCE enters the plume each year that has caused it to assume soil sources of specified sizes in the absence of any confirmatory data.

EPA Response: The stability of the plumes were based, in part, on the TCE and PCE trends from the Dale Avenue and Vannatta Street wells. EPA recognized that there was a slight decreasing trend in TCE concentrations in Dale Avenue, but that the specific concentrations have not significantly decreased over-time. As the Dale Avenue well is not consistently operated, the slight trend observed may be due to an effect other than a decreasing TCE plume and the EPA conservatively assumed that the plume is near steady-state. The calculated mass of 310 pounds of TCE entering the plume each year is clearly described as an estimate with assumptions for the purpose of the Feasibility Study. As presented in the FS, these calculations were completed to assess if the identified TCE mass in the soil was sufficient to maintain the TCE plume. The calculation results, as described in detail in the FS found that only a small fraction of the TCE needed to support the TCE plume was found, leading EPA to suspect an unidentified soil source. As TCE contaminated soil requiring cleanup was an issue along the railroad spur area adjacent to the ANC building and the historic facility drawings alluded to machinery that may have used TCE, the EPA assigned this area as ANC C under the ANC building. See EPA's responses to comments 14 and 15 for a discussion of PPPI's recent sampling at ANC C. The preliminary results from PPPI's recent soil sampling directed by the NJDEP confirmed the presence of TCE contamination well above NJ IGWSCC in both shallow and deep soil samples. These findings further support EPA's conclusion that this facility is a source of TCE groundwater contamination at the Site. EPA will investigate this area in more detail as part of its supplemental soils investigation.

78) ***Page 660, second paragraph*** - The EPA discussion of BTEX compounds is highly speculative. No concrete evidence is presented to support EPA's statements.

EPA Response: The presence of BTEX in groundwater at several upgradient locations suspected as sources of groundwater contamination is well documented in the RI Report. Monitoring wells at Warren Lumber Yard and Saint Joseph's Church exhibit elevated concentrations of toluene with evidence of reducing conditions including low Eh, dissolved oxygen, and nitrate, with elevated concentrations of iron and manganese. Figure 7-9 provides a conceptual rendering of geochemical conditions in the Pohatcong Valley.

79) ***Page 667, first full paragraph*** - The supposed source area identified by EPA is not "centered around the ANC site." The two source areas identified by the EPA based on sampling results are both located on properties to the south and southwest of the former ANC property (Norfolk Southern and AC1 sites). EPA has placed a wholly hypothetical source on the former ANC property itself, but there are no sampling data that support the existence of this source. Even if the hypothetic on-site source existed, it would not be accurate to describe the source areas as centered on the former ANC property.

EPA Response: The TCE groundwater hot-spot is located in and around the former ANC property. When considering the scale of the Pohatcong Valley as a whole, the identified contamination can be considered as being centered around the ANC site. See EPA's responses to comments 9 and 20 regarding the relationship between the ANC site and AC1 and the railroad spur. ANC A and ANC B are considered to be directly associated with the ANC facility as discussed in these responses. See EPA's responses to comments 14 and 15 for a discussion of PPPI's sampling at ANC C. The preliminary results from PPPI's recent soil sampling directed by the NJDEP directly underneath the building confirmed the presence of TCE contamination well above NJ IGWSCC in both shallow and deep soil samples. These findings support EPA's conclusion that this facility is a source of TCE groundwater contamination at the Site. EPA will investigate this area in further detail during the supplemental soils investigation.

80) ***Page 1999, second full paragraph, Appendix I*** - The EPA used image well theory to construct boundary conditions in the isotropic and homogenous ground water model the Agency applied to the Site. Due to the limitations inherent in that model, flow near the crystalline rock boundaries with the carbonate aquifer is overestimated, resulting in distortions of the flow patterns in the critical area near EPA's assumed source areas. As a result, the production wells on the former ANC property appear to capture ground water from the crystalline rock rather than from the re-injection well on that same property. This modeling result is clearly inaccurate. The data from Environ's modeling of the area near the former ANC site show a much more intuitively logical result -- most of the injected water is captured by the nearby production wells (Exhibit 1).

EPA Response: See EPA's response to comment 36. As described above, the model appearing in the RI Report underwent rigorous calibration and verification. The differences (or residuals) between simulated and measured heads at the former ANC site were less than five feet indicating that heads and ultimately flow in the area was reasonably simulated. Responses to Comments 10 and 36 provides EPA's assessment of the modeling developed by Environ. Environ's report fails to present boundary conditions for the model, the main driver of groundwater flow in a numerical

model. Further, the calibration process is not explained. As an example, the differences between measured and simulated values around the injection well appear to be greater than 8 feet. These differences are unacceptably elevated considering the difference in heads across the site are only 8 feet. It should also be noted that EPA's modeling effort, which PPPI has taken exception to, has achieved a calibration of less than 5 feet.

81) ***Page 2001, Table 1-2, Appendix I*** - Due to the nature of the model EPA applied in the RI, the resultant modeled error in head values for the production well on the former ANC property is excessive and reflects the inappropriateness of the model for this portion of the regional aquifer.

EPA Response: The differences (or residuals) between measured and simulated values at the production well used in the calibration process in Appendix I of the RI Report were not excessive. Given a range in head of 120 feet across the model domain, the residual at ANC03 (3.56 feet) represents a less than 3 percent difference. Residuals between the injection well (RW-2) and production well PW-5 simulated in the intermediate bedrock were both greater than 8 feet in the site-wide model developed by Environ. The total range in heads across the model domain developed by Environ were 8 feet for the potentiometric surface measured in August 2003. Thus, residuals in Environ's model were roughly 100 percent of the range in head across the site.

82) ***Page 2001- Formula (Appendix I)*** - The root mean square formula shown as being used to calibrate the model is incorrect.

EPA Response: The formula that was used in the RI was incorrect in that it had typographical errors that should have been corrected, however, the formula is the correct formula to use, and with the correct symbols, is stated correctly below. The root mean square formula from Anderson and Woessner (1992) is:

$$RMS = \left[1/n \sum_{i=1}^{n} (h_m - h_s)_i^2\right]^{0.5}$$

83) ***Pages 2001 through 2028, Packer Tests (Appendix J)*** - The data provided concerning sample collection during the packer tests appears to be inconsistent with the completion dates for the wells in which the packers were placed. In fourteen of the wells, the completion dates are earlier than the packer testing dates. As indicated in the RI, the packer tests were completed on open boreholes before the wells were cased. Therefore, either the dates for the packer tests, or for the well completions are incorrect. Correction of this information is crucial to an evaluation of the efficacy of the packer test results.

EPA Response: The well completion dates provided on the Boring Logs and Well Completion

Diagrams located in Appendix D (Monitoring Well Boring Logs, Construction Diagrams, and Form Bs) represent the date that the drilling was completed, not the date that the monitoring well casings and screens were installed. Packer testing was performed in the open bedrock portion of the monitoring wells prior to final monitoring well completion.

Appendix J covers the hydraulic analyses of the packer test results from two episodes of testing. No discussion is offered of water quality sampling results or methods. Comment 83 has no bearing on the content of Appendix J.

Comments

OU1 Feasibility Study

84) With the publication of the Proposed Plan for OU1, the public, including PPPI and Alcan, has been afforded its first opportunity to comment on the FS. In formulating remedial options for source areas for the TCE plume, EPA deals only with soils on and about the former ANC property. No review of the Five Carp Company, Tung-Sol property, AC1, Vikon Tile or upgradient locations is included in the FS. In addition, no explanation for this highly selective approach is provided.

EPA Response: PPPI was provided with a copy of the final RI/FS in late June 2005, one month in advance of when the Proposed Plan was published. During the development of remedial target areas in the FS, RI data from all investigated PSAs were evaluated, including the Five Carp, Tung-Sol , AC1 , and the Vikon Tile . Concentrations of TCE were detected in soils over the PRGs (in this case the NJDEP Impact to Groundwater Soil Cleanup Criteria) which correspond to the locations designated as ANC A and ANC B in the FS. ANC A in the FS includes AC1. EPA did not find detections above NJ IGWSCC for TCE at any other PSAs. See also EPA's responses to comments 20, 21, 23, 26, 31, 33, 37, 39, 40, and 42. The contaminants of concern at the Site in the groundwater and soil are TCE and PCE.

85) ***Page 9*** - EPA has simply made up two soil source areas. First, in the absence of any data whatsoever, EPA has "assumed" an area called ANC C and imagined it is 100 feet deep and 16,000 feet square. Second, EPA has decided, based on a few centrally located sample points that do not delineate the extent of contamination, that there is a 100 foot deep, 28,000 square foot source area on AC1 and the Norfolk Southern property called ANC A. Finally dimensions for ANC B are created based on one sample location and findings of TCE at depths that clearly could not contribute to groundwater impacts. Perhaps even more amazingly, EPA then proceeds to do an analysis of possible remedial approaches and costs for these fictional areas. EPA's actions in assuming or creating sources to bolster its pre-determinations about soil sources on or near the former ANC property are clearly inconsistent with the NCP.

In the last full paragraph on page 9, EPA acknowledges that based on its calculation of TCE mass

in OU1, the TCE found in soils on and around the former ANC property is insufficient to support the TCE plume. Instead of then concluding that additional TCE sources must exist (or must have existed) in other parts of the OU1 Study Area, as the data indicates, or that its assumptions about contaminant fate and transport may be wrong, EPA adopts the unique strategy of assuming soil sources as noted above.

EPA Response: The ANC A and B target areas were developed based on RI data consistent with the NCP. EPA relied on available data, which places the TCE groundwater hot spot in the immediate area of ANC. The aerial extent of the TCE soils target areas was estimated within the FS for cost estimating purposes; however, it clearly states within the FS that additional delineation sampling will be required during remedial design to further refine these target areas. EPA has revised this approach to conduct a supplemental soils investigation prior to finalizing the soils remedy and will proceed with the groundwater remedy as selected in the present ROD. The depth of contamination at ANC A was based on the depth to the regional groundwater aquifer and the results of soil samples collected from within the target area at a depth of 81 feet below ground surface (sample PVANC39 with TCE at 29 ug/Kg). ANC B was based on one soil sample exceedance of the PRG. The relatively small lateral area and shallow depth of this sample result does not mean that remedial actions are unnecessary for this target area. While the potential impacts to groundwater may be minimal at the ANC B target area, protection of groundwater through soil remediation is only one of the RAOs developed in the FS. Additional remedial actions will be necessary at the ANC B target area to prevent exposure to impacted soils and to prevent erosion and migration of contamination.

The hypothetical area ANC C was initially developed based on the significant mass flux differences from soil to groundwater, independent of the actual location. However, after review of the operational history at the ANC facility (including an extensive network of floor drains and discharge pipes; see also EPA response to comment 24, as well as aerial photographs), the suspected ANC C area was assumed to be under the production building, although it might be elsewhere under the building, including adjacent to or near the building. EPA designated this area in the FS as a suspected target area, contingent on additional investigation activities. See EPA's responses to comments 14 and 15 for a discussion of PPPI's recent sampling that appears to confirm EPA's conclusion that ANC C is a TCE source area.

86) ***Page 9 - third full paragraph*** - EPA describes ANC B as being five feet in depth. However, groundwater in this area is about 100 feet below ground surface. Therefore, given EPA's own findings, ANC B could not have contributed any TCE to the regional ground water and can not be viewed as a source area. No remedial actions are needed to protect against the non-existent risk to groundwater presented by ANC B. Despite the non-existent risk, EPA proposed excavation of ANC B to protect groundwater.

EPA Response: The ANC B target area was designated as an area requiring remedial actions since soil contamination was detected over the PRG (in this case the NJDEP Impact to Groundwater Soil Cleanup Criteria). Knowing the time frame of impacts (first identified in the early to mid 1970's in

groundwater), it is very likely that the contamination seen in shallow soils at ANC B is old residual contamination. As stated in EPA's response to comment 85, while the potential impacts to groundwater may be minimal at the ANC B target area, protection of groundwater through soil remediation is only one of the RAOs developed in the FS. Additional remedial actions are necessary at the ANC B target area to prevent exposure to impacted soils and to prevent erosion and transport of contamination. Further investigation work including borings at depth to groundwater to better define the source area will be conducted as part of the supplemental soils investigation.

87) ***Page 11, Table 5-1 and Table ES-1*** - The presentation of SO3 is inconsistent with the detailed analysis of alternatives presented in the FS Table 5.1. For example, in Table 5.1 (page 129 of the FS), the detailed analysis of the alternatives and specifically SO3, omits consideration of ANC C. It should be clear that all alternatives and the related components (e.g., off-gas control requirements) are fully evaluated for the entire TCE mass expected to be treated.

EPA Response: All of the target areas were included in the detailed evaluation of remedial alternatives, as summarized in Table 5.1.

88) ***Page 15, first full paragraph*** - EPA states:

The perched aquifers are localized and limited in extent, they do not represent a significant conduit for the migration of impacted groundwater and are not used as a potable water source.

As noted in comment 9 above, there are no perched aquifers on the former ANC property.

EPA Response: As EPA describes in its responses to comments 9 and 33, the perched aquifer noted on the ANC PSA was based on two borings and one monitoring well installed adjacent to the railroad spur that exclusively served the former ANC facility and was therefore included in the ANC investigation write-up. The location of the ANC property line in this area has not been firmly established by a boundary survey and title search with surveyed markings on the ground.

89) ***Page 16, second full paragraph*** - Here EPA states:

". . based on information provided by the current owner of the ANC facility, surface discharges to this area may have been initiated in the 1950's."

This statement does not reflect the fact that information about early discharges at the former ANC property is not definitive or detailed. Some recognition about the quality of available information should be included in the FS.

EPA Response: The EPA's statement was based on information provided by ANC and PPPI in their 104e responses.

90) ***Page 16, third full paragraph*** - EPA states that, based on RI soil investigation, the depth of two source areas at ANC/AC1 vary, with one location exhibiting impacts only as deep as five feet, while the other exhibits impacts going down to one hundred feet. That statement is not entirely accurate. The one hundred foot depth is assumed by EPA; it is not based on sampling data. Furthermore, ANC A and B are not, in fact, on the former ANC property.

EPA Response: EPA clearly states in the FS that a pre-design investigation will be necessary to complete the horizontal and vertical delineation of the TCE soil concentration and that the estimated volumes were assumed for the purpose of completing the FS. The location of remedial area ANC A is located adjacent to the railroad spur that exclusively served the ANC facility and ANC B is located at the base of the slope from the ANC facility. See also EPA's responses to comments to 9, 20, 22 and 23.

91) ***Page 16, Section 1.5.1*** - In this section of the FS, EPA repeats some of its suppositions from the RI. For example, EPA states, as if it is fact, that 1940 pounds of TCE remain in the soils (third paragraph). The mass of TCE in the soils is a calculation based on extrapolating data from a few limited sampling points over a much larger area and is based on untested assumptions concerning soil chemistry and conditions. In that same paragraph, EPA seeks to explain away the discrepancy between its "calculation" of total TCE in the regional aquifer with the lack of data showing sufficient TCE at the former ANC property by creating a source area of the necessary size beneath the building on that property and attributing specific dimensions to two other supposed source areas. As stated in earlier comments, concocting source areas on a particular property to explain away impacts or discrepancies in the calculations is inconsistent with the NCP and CERCLA.

EPA Response: As stated in EPA's response to comment 85, the mass of contamination remaining in soils were estimated based on existing RI data. These contaminant masses were estimated for the purposes of the FS and will be further refined during the supplemental soils investigation. This approach is not inconsistent with the NCP and CERCLA. See also EPA's responses to comments 14 and 15 for a discussion of PPPI's recent sampling that appears to confirm EPA's conclusion that ANC C is a TCE source area.

92) ***Page 17, Section 1.5.2*** - In describing the TCE groundwater impacts, EPA simply ignores the fact that TCE was detected in a number of locations upgradient of the former ANC property and in wells located upgradient of the industrial operations on the former ANC property. Figure 1-4 also conveniently ignores the data showing relatively high levels of TCE in domestic wells upgradient of the former ANC facility. TCE was also detected in MW5 and MW7 on the former ANC property. Both of these wells are located upgradient of industrial operations at that property. EPA may not simply disregard data that does not support its pre-conceived view of the regional situation in completing its FS.

EPA Response: No data were disregarded during the evaluation of remedial alternatives for the OU1 Study Area. Data from upgradient sources does not suggest that contamination is solely

related to other PSAs.

The highest TCE concentrations in groundwater in the OU1 Study Area occur at the ANC, VTC, and WLY areas. Of these areas, elevated TCE concentrations in soils above the NJDEP Impact to Groundwater Soil Cleanup Criteria were only found in the ANC area and near the boundary between the ANC area and AC1 area. EPA recognized that there are elevated TCE groundwater concentrations at upgradient areas, but these concentrations greatly increase as the groundwater passes beneath the ANC site. EPA views this fact as direct evidence that an active soil source is associated with the ANC site. See also EPA's responses to comments 14 and 15 for a discussion of PPPI's recent sampling that appears to confirm EPA's conclusion that ANC is a TCE source area.

93) ***Page 17, Section 1.5.2*** - At the end of the first paragraph in this section, EPA asserts there are approximately 8,240 pounds of TCE in the groundwater. It is not technically possible for EPA to make that calculation given the information available to the Agency. As EPA has stated, the Pohatcong Valley has a complex groundwater regime which includes karst features. EPA does not have the necessary fracture, flow and volume information before it to conclude that 8,240 pounds of TCE are present in the 8.75 square mile area. Nor does EPA have sufficient measurements of TCE concentrations throughout the plume area to arrive at the 8,240 pound figure.

EPA then back calculates that, if 8,240 pounds of TCE are in the plume and the plume is in a steady state as far as TCE is concerned, then a certain level of TCE must be present in soil sources. The Agency then goes one step further and decides that not only must that TCE be present in soil sources, but these sources must be on or related to the former ANC property despite data to the contrary. This type of wholesale fictionalization of conditions in the Pohatcong Valley Ground Water Site OU1 is not conducive to selection of an appropriate and effective remedial action. It is also clearly inconsistent with the NCP.

EPA Response: The mass of groundwater contamination included in the FS is an estimate based on RI data collected throughout the Valley in accordance with NCP requirements. While it is acknowledged that the geology and hydrogeology throughout the Valley is complex, the estimate of mass flux from soil to groundwater was prepared for cost estimating purposes in the FS, and to also evaluate if additional sources of contamination may exist that were not seen during the investigation of the OU1 Study Area.

Groundwater data collected during the RI and from samples collected in the Vannatta Street and Dale Avenue municipal wells confirm that concentrations of TCE are at steady-state conditions over time (see Figures 1-6 and 1-7 in the FS), while for PCE, the overall trend is slowly decreasing. This data supports the conclusion that a continuing source of contamination exists in the Valley. The results of the RI and data collected by PPPI and its predecessor at the property under the ISRA investigation have determined that TCE is present in soils at the facility. Therefore, it was determined from this data that the ANC facility is a source of contamination.

94) ***Page 18, first full paragraph*** - In this paragraph, EPA concludes that such factors as adhesion and surface tension act to restrain migration and "retain contaminants within the soil media." EPA further states that these physical processes result in the spreading of TCE "vertically throughout the soil column under the original source area" (emphasis added). EPA then proceeds to disregard these statements in identifying soil source areas at or near the former ANC property. ANC Area B only shows TCE to a depth of five feet, yet EPA assumes it is a source of TCE to groundwater over a hundred feet deep. Other sampling at the former ANC property similarly shows no detection of TCE below a depth of 6.5 feet with ground water some eighty or more feet deeper. EPA provides no explanation for these contradictory aspects of its RI/FS reasoning.

EPA Response: Soil target areas were based on areas with concentrations of TCE exceeding PRGs. In this case, the PRGs were defined as the NJDEP IGWSCC. As stated in EPA's response to comment 85, regardless of whether the potential impacts to groundwater may be minimal at the ANC B target area, protection of groundwater through soil remediation is only one of the RAOs developed in the FS. Additional investigation and remedial action at the ANC B target area are necessary to prevent exposure to impacted soils and to prevent erosion and transport of contamination. Also see EPA's responses to comments 14, 15 and 28 regarding NJDEP concerns about data quality of previous sampling at the ANC facility and its request for further investigation of VOCs in a number of areas throughout the ANC site.

95) ***Page 18, second full paragraph*** - In this paragraph, EPA repeats its assumption that influences from the re-injection well are responsible for TCE impacts at the VAN property. However, as the attached modeling report shows (Exhibit 1), EPA's assumed mounding influence does not, in fact, exist. EPA does not attempt to present any explanation for the upgradient TCE impacts at the Washington Mechanical property, which is significantly further upgradient than the VAN location.

EPA Response: As previously noted in EPA's responses to comments 36, 38 and 45, the mounding effect is illustrated in the model provided by PPPI (Figure 7) and the effect shown is dependent on the groundwater flow direction and calibrated model input values. The mounding would appear to extend back toward the VAN site if the groundwater flow direction was more to the west, consistent with the RI report assessment of groundwater flow direction.

TCE has been detected in groundwater from areas upgradient from the ANC site. Investigations were conducted at several upgradient sites and no soil sources were found. Based on the known TCE concentrations in the areas upgradient from the ANC site, it is apparent that the TCE concentrations increase as the groundwater migrates through the former ANC facility property. This contribution to the TCE plume from the ANC area further suggests that the ANC site represents a major source of TCE for the identified plume.

96) ***Page 18, last full paragraph*** - In this paragraph, EPA explicitly admits that there must be an, as yet, unsampled source of TCE to the groundwater. That said, EPA then goes on to create a 16,000 square foot source and ascribe 28,000 square feet to another source, in the absence of

supporting data. Again this exercise in designing remedial approaches for made-up source areas is not consistent with the intent or language of the NCP.

EPA Response: Various iterations of this comment are addressed in EPA's responses to comments 79, 85, 100, 103, 104, 106, 117, 118, 151, as well as in EPA's response to PPPI's Conclusion. The evaluation of mass flux from soil to groundwater was completed to estimate if additional sources of contamination may exist that were not observed during the investigation of the OU1 Study Area. It was determined during that evaluation that additional sources of groundwater contamination may exist within the OU1 Study Area that continue to cause contaminate concentrations in groundwater to remain steady over time. Based on the location of the TCE groundwater hot spot, the operational history of the ANC facility and actual data collected on and in the vicinity of the ANC facility, the suspected area was included in the FS to be at ANC. (See EPA's responses to comments 14 and 15 for a discussion of PPPI's recent sampling that supports EPA's conclusion that a TCE soil source exists at the former ANC facility.) It was acknowledged that further investigation is needed for verification. Depending upon the results of the supplemental soils investigation, the size of the source area and extent of any soil ultimately needing to be remediated may be adjusted upwards or downwards. A soils remedy will be documented in a ROD after EPA completes the supplemental soils investigation.

97) ***Page 19, third full paragraph*** - EPA states that TCE concentrations in the ground water will exceed the New Jersey Groundwater Quality Standard for over one hundred years. No basis for that conclusion is provided in the FS.

EPA Response: The time estimate was based on an extrapolation of the time-series data presented for the Dale Avenue well.

98) ***Page 21, second bullet point under the heading Human Health Risk Characterization*** - EPA states that the TCE detected in surface and subsurface soil at ANC/AC1 may pose carcinogenic and/or non-carcinogenic hazards to residents, industrial/construction workers. These speculative risks are supposedly associated with inhalation of TCE in volatile and fugitive emissions from the soil. However, Section 6 of the RI finds no such potential unacceptable risks. In fact, that section concludes that these soils present no unacceptable risks other than those associated with certain naturally occurring metals. EPA may not disregard its own risk assessment to assume potential risks exist for remedial options development.

EPA Response: EPA is not disregarding the risk assessment. Based on the HHRA, soils at ANC detected during the RI are below or within acceptable USEPA ranges; however, AC1, which is identified as having as its source ANC (See EPA's responses to comments 9, 20, and 23) has future child and adult resident cancer risks, as well as risks to an outdoor worker and a construction worker, that are above the USEPA acceptable cancer range due to inhalation of TCE.

99) ***Page 22, Section 1.8*** - In the third paragraph, EPA again refers to the 1940 pounds of TCE in soils. The human health assessment is then based on the assumption that this TCE is present.

Basically, EPA is piling hypotheticals on top of fictions throughout its risk evaluations. The intent of the NCP is clearly that sufficient data be developed before risk or remedial decisions are attempted. That was not done here.

EPA Response: The mass of TCE in soils was calculated based on actual RI data collected from soils in the Valley. The human health risk assessment was based on the fact that TCE is present in soils in the area of the ANC facility. There were no hypothetical or fictitious assumptions made during these risk evaluations; the results of soil samples demonstrated that soil sample results in the area of the ANC facility had concentrations of TCE that dictates the need for additional remedial actions.

100) ***Page 23, first full paragraph*** - EPA again describes the assumed source as an original source. EPA should be clear throughout the document that the soil source is not a true documented source, but rather an assumed or suspected source without data to support its existence.

EPA Response: This is addressed in EPA's responses to similar comments. See EPA's responses to comments 79, 85, 96, 103, 104, 106, 117, 118, 151, and EPA's response to PPPI's Conclusion. The ANC C target area was designated as a "hypothetical" source area throughout the FS, contingent on the results of what the FS called pre-design investigations. EPA's conclusion that ANC C is a TCE source area is being borne out by PPPI's recent 2006 sampling. See EPA's responses to comments 14 and 15. Target areas ANC A and B were determined based on actual RI soil data. EPA will conduct a supplemental soils investigation prior to finalizing the soils remedy and will proceed with the groundwater remedy as selected in the present ROD.

101) ***Pages 24 and 25, Table 1-1 and 1-2*** - EPA makes the point of describing the number of environmental samples included in the RI as apparent evidence of the comprehensive nature of its investigative activity. However, EPA stops short of admitting the source has still not been documented, but assumed.

EPA Response: The EPA investigation was comprehensive and provided an overall summary of the site conditions throughout the Valley. During the investigation activities, soil contamination exceeding the PRGs (the NJDEP IGWSCC) has been detected at locations along definitive surface water discharge locations of the ANC facility. Also, during historical ISRA investigations of the ANC facility, TCE had been detected in soils at the facility well above the clean up goal. Therefore, EPA believes that the primary source of contamination throughout the Valley has been determined. Moreover, communication with NJDEP and PPPI's consultant in early 2006 indicate that recent sampling conducted beneath the building have found elevated soils TCE hits in soils at levels above the NJDEP IGWSCC cleanup number. See EPA's responses to comments 14 and 15. Additional source areas within the original discharge area of the ANC facility may be present, and therefore further investigation work will be conducted at the ANC facility and in the immediate area, prior to EPA selecting a soils remedy.

102) ***Page 35, Section 2.2.1*** - EPA casually equates the findings for the AC1 soils and the

former ANC property soils. There were no exceedances of TCE standards found on the former ANC property by EPA during the RI. EPA simply ascribes any exceedances found in that area of OU1 to the former ANC property though the RI does not present data to confirm these assumptions. For example, there is no actual data connecting the former ANC property drainage point known as AOC 16 to AC1 soil findings.

EPA Response: See EPA's responses to comments 9, 20, and 23. A detailed description of the TCE detections in soil from the AC1 and ANC PSAs are provided in the RI Report as well as an explanation of the connection between historical discharges at the AOC16 area and the soil impacted with TCE.

103) ***Page 38, Section 2.4.1*** - In the second paragraph of this section, EPA states that "it has been assumed that ANC A will require remediation to the water table. . . ANC C is assumed for costing purposes to contain TCE distributed to an approximately 16,000 square foot area." No data shows that ANC A is 100 feet deep or that it requires remediation to that depth. Even more incredible, no data exists to show that assumed ANC C exists at all; the area is a product of EPA's imagination.

According to the NCP, the RI is to provide sufficient data to allow remedial alternatives to be defined and evaluated under the nine NCP criteria, including cost. The Pohatcong Valley Groundwater Site OU1 RI did not achieve that goal. The NCP does not then allow EPA to simply assume contamination impacts to the extreme point of totally making up source areas to evaluate under the nine criteria in the FS. EPA clearly wanted to move along in a CERCLA process that was taking more time than was desirable to complete. However, EPA may not simply disregard the NCP in rushing toward a final remedial decision.

EPA is apparently applying the same soil target cleanup standard to soils (whether real or assumed) without consideration that one location is already covered (assumed area ANC C is beneath the existing manufacturing building). The soil target cleanup standard for the soil beneath the building should differ from areas without cover.

EPA Response: As stated in EPA's response to comment 85, the depth of contamination at ANC A was based on the depth to the regional groundwater aquifer and the results of soil samples collected from within the target area at a depth of 81 feet below ground surface (sample PVANC39 with TCE at 29 ug/kg). Also, it has been documented in numerous previous comments (see also EPA's responses to comments 85, 93, 97, 99, 103, 106, 119, 123, 124, 126, and 127) that the ANC C target area was defined based on differences in mass flux from soil to groundwater and other evidence, including 104e responses, aerial photographs, and the known operational history at the ANC facility. It has been documented in several EPA reports to date and in numerous responses to comments that the ANC C target area was defined as "hypothetical" contingent on the results of additional investigations. See EPA's responses to comments 14 and 15 regarding PPPI's recent soil investigations in the ANC C area, underneath the building, that confirm the presence of TCE in soils in the area of ANC C at levels above the NJ IGWSCC.

The RI data gathered and used to develop the target areas, remedial approaches, remedial alternatives, and order of magnitude costs is appropriate for the OU1 Study Area. While it is acknowledged that more delineation sampling is required, EPA believes that the alternatives presented in the FS are appropriate alternatives to address impacted soils; irrespective of the ultimate volume of soils treated.

If the results of the supplemental soils investigation demonstrate that TCE is detected over the PRG (the Impact to Groundwater Soil Cleanup Criteria) in the ANC C Area, or any other area investigated, then remedial actions will be implemented in those areas. The Impact to Groundwater Soil Cleanup Criteria is the most stringent cleanup criteria for the protection of groundwater. Site-specific considerations such as the potential for volatilization to indoor air and leachability would be considered. In particular, the potential for leaking sewers and drainage pipes below the foundation to be sources of TCE or sources of infiltration to cause further TCE leaching will be investigated. At this point, the Impact to Groundwater Soil Cleanup Criteria is considered the appropriate cleanup standard for site soils, by both the NJDEP and EPA. The 2006 PPPI investigation under NJDEP oversight has detected TCE over the PRG. The suggestion that the existing building serves as a remedial "cover" is not an appropriate remedy.

104) ***Page 41, Figure 2-1*** - EPA has drawn each of the areas of supposed soil contamination it has attributed to the former ANC operations on this figure. Assumed ANC Area C is properly labeled as "suspected" since absolutely no data exists showing that any such area of any size or depth exists. However, Areas A and B are shown as red circles. One sample defines Area B. The Agency provides no explanation as to how one sample is adequate to define the lateral extent of an area. A similar problem exists with Area A. Here the Agency used three locations to define the circle. No samples define the drawn boundaries of this Area, yet its dimensions are treated as fact by EPA in its RI/FS.

EPA Response: The areas exceeding PRGs were not defined solely by the sample results exceeding PRGs. There were samples surrounding each of these locations that had concentrations of TCE below the PRGs. The target areas were extrapolated based on these sample results. The limited RI investigation in these areas was not enough to accurately determine the actual amount of soils that need to be remediated. This will be accomplished in the supplemental investigation of these areas.

The FS clearly states that further investigations would be required to assess the lateral and vertical dimensions of the ANC A, ANC B, and ANC C. Future investigations will be focused on refining the treatment volumes. Since PPPI's submission of its comments, it has conducted sampling in the ANC C area that confirms the presence of TCE contamination in both shallow and deep soils above the NJ IGWSCC.

105) ***Page 42, Figure 2-2*** - This figure purports to show the TCE Groundwater Area exceeding PRGs. However the Washington Mechanical property is not included in the contours despite the detection of 130 ppb of TCE in the groundwater at that location. EPA provides no explanation for

its elimination of the Washington Mechanical property - an area where significant TCE contamination is known to be present in the groundwater - from the Site Figure.

EPA Response: The TCE detection in groundwater at the Washington Mechanical PSA was not confirmed by EPA during the RI. Figure 2-2 was based on the analytical results collected by EPA. See also EPA's response to comment 38.

106) ***Pages 68, first and second full paragraph*** - EPA states that the six alternatives are based on "the current understanding of the extent of TCE contamination in soils" when a large mass of the contamination to be treated is assumed or hypothetical. Further, EPA states that if the soil contamination is limited to above 25 feet then the DPE system component may be modified to a simpler SVE system. Based on the known soil impacts, a simpler remedy would seem to be the appropriate response. EPA is required under the NCP to develop a remedy taking into consideration all of the known environmental impacts.

EPA Response: As stated previously, the remedial alternatives developed in the FS were based on known environmental conditions and investigations. Since PPPI's submission of its comments, it has conducted sampling in the ANC C area that confirms the presence of TCE contamination in both shallow and deep soils at depths below 25 feet, above the NJ IGWSCC. EPA no longer considers ANC C to be hypothetical or assumed. A supplemental soils investigation will facilitate refining the extent of the target areas prior to the selection of a remedy.

107) ***Page 69, second full paragraph*** - Here EPA estimates that the volume of soil to be managed in Area B is 370 cubic yards. That estimate is based on one sample. EPA simply has no way of knowing the extent of the Area B it has asserted exists. Using its assumptions about Area B, EPA concludes the best remedial alternative is excavation with disposal on a Subtitle D landfill. EPA further assumes, without providing any supporting detail, that the costs of such work are so minor that they do not need to be considered in the cost comparison in the FS.

On the same page, in the next paragraph, EPA states that because the volume of soil in ANC A is unknown, no cost estimate for its excavation is included in the FS cost analyses. Apparently the Agency is less confident about estimating based on three samples, than it is based on one sample. The Agency's approach to remedial costing in the FS is clearly inadequate and inconsistent with NCP requirements.

EPA Response: The assumption for excavation and offsite disposal of ANC B target area was based on the low volume and shallow location of soil above cleanup standards seen during the RI. The size of the area is based on multiple samples. Costs for removal of the ANC B target area were included in all of the alternatives evaluated in the FS (estimated at approximately $133,000; see Appendix E in the FS). The evaluation of the ANC A area included DPE for soils with COCs above the PRGs; excavation costs were not included for this target area, but rather DPE and shallow soil mixing were costed. Excavation costs were not included in this area since excavation was not planned. The evaluation and cost estimates were consistent with NCP requirements. As

discussed in previous responses, a soils remedy will be documented in a subsequent ROD upon the completion of the supplemental soils investigation.

108) ***Page 71, second full paragraph*** - EPA states that given the low permeability of soils at the former ANC property, TCE may persist in those soils for decades. This statement is telling for two reasons. First it acknowledges the low permeability of the soils at the former ANC property, a fact EPA questioned in other parts of the RI/FS. Secondly, the statement acknowledges that TCE (were it present) would persist in such soils for decades. Yet, data from the former ANC property shows that TCE is non-detectible in soils below 6.5 feet. If the TCE were migrating from shallower soils to the regional aquifer beneath the former ANC property, TCE would persist in the intervening low permeability soils according to EPA. It does not.

EPA Response: TCE is persisting in soils immediately downgradient of the ANC property, in obvious discharge locations of the former or existing operations of the facility. Detailed surface water and operational discharge patterns from the facility, along with documented use of TCE at the facility, and sampling results have demonstrated that TCE in soils is present and has continued to be persistent for an extended period of time at the former ANC facility. Furthermore, the statement that TCE is non-detectable in soils below 6.5 feet throughout the property is not supported by data. See EPA's response to comment 28.

EPA agrees that some soils at the site may have low permeability but does not over-apply this rationale to inaccurately depict all the soils at the ANC site as having low permeability, especially where more permeable soil-types have been observed. See EPA's response to comment 12.

109) ***Pages 75, Section titled Pneumatic Fracturing*** - EPA fails to recognize the potential issues with pneumatic fracturing. As recognized by Federal Remediation Technology Round-Table, pneumatic fracturing has the potential to create new pathways for unwanted migration of the contaminants. Instead of taking advantage of the benefits from the naturally low permeability soils, EPA is proposing to mix and fracture those soils thereby opening migration pathways. This disadvantage of fracturing should have been clearly considered in the FS.

EPA Response: It is acknowledged that there are limitations to pneumatic fracturing in the geology at the site. However, the geology at the site requires the consideration of this technology for increasing the permeability to promote more effective remediation, no matter what remedial alternative is chosen. Assumptions have been included in the FS, including the costs, for pilot testing for pneumatic fracturing to verify whether it will be effective during implementation. The evaluation of new potential migration pathways will be evaluated during pilot testing. However, it is believed that pneumatic fracturing will assist at making DPE more effective over the entire soil column. A soils remedy will be documented in a ROD upon completion of the supplemental soils investigation.

110) ***Page 79, under the heading Site Preparation/Restoration*** - This alternative involves moving production equipment, shoring up the building supports and generally rendering an area of

the plant unusable. As the Agency is aware, the former ANC plant is an operating facility. PPPI has no interest in dismantling its process areas for an indeterminate period. This remedial alternative must be rejected as impracticable.

EPA Response: While it is acknowledged that operations at the plant may be disrupted during implementation of a soil remedy, if the results of the supplemental soils investigation determines that the contamination underneath the building is impacting human health and/or the environment, remedial actions will be required to address this contamination. Remedial actions such as DPE and SVE have been implemented at other active facilities with minimal disruption to operations. A soils remedy will be documented in a ROD upon the completion of the supplemental soils investigation.

111) ***Page 81, under the heading Dual Phase Extraction*** - The bullet points under this heading illustrates the absurdity of drafting an FS when source areas are created in the absence of data. Here, EPA has assumed the size of each source area, which then led to an estimate of wells and spacing. An assumed average TCE concentration then leads to an estimate of emission rate. This entire remedial alternative is founded on one assumed condition after another. The NCP clearly does not contemplate such an approach to remedial options development.

EPA Response: It has been stated in previous responses that the remedial target areas, and the estimate of treatment wells and emission rates of treatment systems, were estimated from existing RI data and are included for cost estimating purposes. The process used to evaluate remedial alternatives is consistent with the NCP. Data collected is sufficient to support the groundwater remedy. Additional data will be collected to support a future soils remedy.

112) ***Pages 82 through 84 under the heading "Groundwater Alternative G2*** - Monitored Natural Attenuation and Institutional Controls" - EPA rejected the monitored natural attenuation water alternative on the basis that it would take fifty-nine years to achieve EPA's concentration goals. However, EPA's own FS modeling shows that monitored natural attenuation would take only fourteen years to achieve EPA's defined goals at the source and fifty-nine years only at the downgradient edge of the plume. The selected groundwater alternative is modeled to take ten years and fifty-five years in the analogous portions of the plume. Given EPA's repeated statements that any short term risk from ground water has been addressed through the existing alternative water supplies, EPA has no basis for eliminating monitored natural attenuation as a groundwater remedial alternative given its modeling results. This is particularly true given the complex hydrogeology in the region and the costs savings this approach would produce. Further it is consistent with remedies at similar sites with similar hydrogeology (e.g., Dorney Road (Oswald) Landfill in Lehigh and Berks County, Pennsylvania (EPA ID: PAD980508832) where monitored natural attenuation and point of use treatment have been implemented.

EPA Response: The times of remediation (TOR) estimates that were developed based on modeling should be viewed as general order-of-magnitude estimates that are useful for comparing alternatives, but should not be viewed as definitive estimates of the actual time to achieve drinking water MCLs. EPA did

not reject the monitored natural attenuation water alternative on the basis that it would take fifty-nine years to achieve remediation goals.

Under the initial screening of the groundwater alternatives that was conducted prior to selecting the four alternatives that were carried through the FS and presented in the Proposed Plan, the FS evaluated a number of potential alternatives. Section 4.3.2. of the Feasibility Study (FS) points out that Groundwater Alternative G2 (which was called Monitored Natural Attenuation and Institutional Controls, and not to be confused with the later Preferred Alternative GW2), was screened out based on a number of factors. For example, compared to the selected alternative GW2, Alternative G2 does not actively reduce toxicity, mobility and volume (TMV) of contaminants through treatment (see page 97 of the FS). Moreover, Alternative G4 (which was later renamed in the FS as Alternative GW2) would actively address containing groundwater hot spot areas, thus preventing the spread and migration of groundwater contamination away from the hot spot areas. In contrast, Alternative G2, which relies on MNA alone, will not contain the groundwater hot spot area contamination, nor prevent the continued spread and migration of VOCs. The greatest mass of groundwater contamination is contained within the hot spot areas when compared to the contamination within the rest of the plume. TCE contamination within its hot spot area was detected at levels up to 2,100 times the regulatory level. Active treatment of groundwater hot spots will reduce the mobility and volume of groundwater contamination, which will also make MNA more effective in the downgradient portions of the plumes.

It should be noted that the TORs for G2 and GW2 were not the only factor considered in the remedy selection process. Although the modeled time frames for G2 and GW2 are similar, all groundwater modeling is limited in making predictions of cleanup time frames. Page 171 of the FS outlined some of the major limitations to the model that was used. For example, the model assumed simple groundwater flow conditions, and is highly sensitive to estimates of the retardation coefficient of the chlorinated VOCs. In addition, the model only approximates complex processes that occur in the field, and it assumes steady state conditions. As noted in the RI, the aquifer is complex and the leaching rate of contamination from soils sources to groundwater is unknown, and for modeling purposes was assumed to be zero, which would have underestimated the soils source areas' contribution to the groundwater contamination. Furthermore, the FS modeling was predicated on the removal of the TCE soils source areas. With Alternative G2 (MNA with institutional controls), this would necessitate the complete identification, delineation, and remediation of the soil sources. Neither the EPA nor NJDEP have selected a remedy to address the soils sources at this time. Therefore, Alternative GW2 is the appropriate remedy to contain and prevent the further spread of groundwater contamination.

Based on its experience, EPA believes that a remedy that actively reduces contaminant mass in the hot spot areas will remediate the aquifer significantly faster than MNA alone. A number of other considerations have led the Agency to select GW2 as the best alternative for this Site. CERCLA Section 121(b)(1) mandates that a remedial action must be protective of human health and the environment, must be cost-effective, and must utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

CERCLA Section 121(b)(1) also establishes a preference for remedial actions that employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site, over remedial actions not involving such treatment. Alternative GW2 includes active treatment of groundwater, whereas G2 does not include any active treatment. In addition, GW2 will hydraulically contain the groundwater contamination hot spot areas, which are on-going sources of groundwater contamination.

Based on the above, Alternative G2 was eliminated from the detailed alternatives evaluation. Alternatives that combined MNA with technologies that actively reduce the TMV were included in the detailed alternatives evaluation in the FS. The selected groundwater remedy, which includes active treatment in the groundwater hot spots and MNA for the remaining portions of the plume, provides the best balance of tradeoffs in the evaluation of CERCLA's nine criteria as discussed in the FS and Proposed Plan.

The comparison of the Pohatcong Valley Groundwater Contamination Site with the referenced Dorney Road Landfill example is inappropriate since the groundwater contaminant levels at the Dorney Road Site do not exceed regulatory action levels and therefore do not require treatment for drinking water purposes. Whereas, the groundwater contaminant levels at the Pohatcong site have been detected at up to 2,100 times the regulatory level and require treatment to protect human health. See EPA's response to comment #156 as well.

113) ***Page 83, under the heading "ANC Production Well Treatment"*** - EPA comments that re-injection of groundwater on the former ANC property results in water table mounding that could lead to potential spreading of the TCE plume. As Exhibit 1 to this submission demonstrates, the mounding caused by the re-injection is quite limited in scope and therefore would not be a significant factor influencing the TCE plume.

EPA Response: A preliminary review of the modeling provided by PPPI does show a mounding effect (Figure 7). The mounding may or may not be captured by the modeled site production wells based on interpreted groundwater flow directions and model calibration input values presented. See EPA's response to comment 36.

While EPA acknowledges that the reinjection of groundwater at the ANC facility may have minimal impacts on groundwater flow, EPA is simply stating that the reinjection may have localized impacts on the groundwater flow patterns compared to the overall flow regime and plume.

114) ***Page 84, third full paragraph*** - EPA states that monitored natural attenuation of the TCE/PCE plumes is expected to take 59 years. The Agency does not make clear whether it is the TCE or the PCE which is dictating that time estimate.

EPA Response: The estimate of the 59 years for MNA is based on the TCE plume.

115) ***Page 94, first sentence*** - EPA states that the average width of the TCE plume is 3,000 feet; the thickness is 200 feet and it is over five miles in length. The RI does not present sufficient data to legitimately define an average plume width or its depth. EPA is once again extrapolating plume characteristics from a limited data set and improperly presenting them as fact. These elements are critical to EPA's analyses of groundwater remedial alternatives and selection. It is inappropriate to use such unmeasured parameters as the basis for remedial selection.

EPA Response: RI data shows that the area of impacted groundwater is extensive and extends along the entire Valley in the OU1 Study Area. As documented earlier, the plume appears to be in steady-state concentrations, thus indicating a continuing source of contamination.

The plume definition depicted in the RI and FS is based on analytical results from site-wide monitoring wells installed across and along the valley. The plumes were interpolated using the data (not extrapolated). Additional investigations may be conducted during the pre-design phase of the selected groundwater remedy implementation.

116) ***Page 101, Figure 4-1*** - This drawing of ANC A depicts EPA's dual phase extraction option. However EPA has not provided adequate data supporting any need for dual phase extraction. EPA simply assumes that since TCE is a volatile, there must be a need to extract vapors from the soils in addition to treating the groundwater. Again, EPA lacks the data to evaluate the appropriateness of applying dual phase extraction in the so-called soil source areas.

EPA Response: DPE and/or SVE is a documented remedial technology that is appropriate for the remediation of TCE in soils and groundwater. TCE is a volatile compound and can be recovered by DPE/SVE. As stated previously, it should be noted that a soils remedy has not been finalized in the present ROD.

117) ***Page 113, last paragraph*** - With the last sentence of this paragraph, EPA has highlighted an inconsistency in its portrayal of the Site and the supposed source areas. In that sentence, EPA concludes that a cover over assumed area ANC C would have no effect since ANC C is supposedly under a building. The remedial alternative of capping is intended to reduce infiltration and therefore slow leaching to ground water. What EPA is in effect saying is that if ANC C exists at all, the building has already minimized but not eliminated leaching to ground water. Add that to the admittedly low permeability soils, lack of perched water and depth to groundwater and the potential TCE contribution to the regional aquifer from EPA's imagined ANC C appears small.

Yet in its calculation, EPA assumes that ANC C contributes 266 lbs per year of TCE to the regional groundwater. No mechanism for this supposed movement of hundreds of pounds of TCE beneath the building through over eighty feet of low permeability soils is presented. In its modeling analyses, EPA has assumed an infiltration rate of one foot per year at both ANC A and ANC C. No explanation is provided as to how the same infiltration rate can exist at low lying uncovered ANC A and concrete covered ANC C.

***EPA Response*:** A significant potential mechanism for leaching of TCE to groundwater below a building is leaching from soils contaminated from leaking sewers, old drain lines, or even underground storage tanks (USTs). PPPI has repeatedly stated that its knowledge of past operations is limited; therefore, leaking sewers, drain lines and USTs cannot be ruled out, and should be investigated. Both older process sewers and USTs are often heavily cracked and corroded. TCE discharged to such sewers would be expected to leak into soils below the sewer. Subsequent exfiltration of process waters in the sewer would continue to leach residual TCE to the water table. Although the building may minimize leaching of contaminants, it would not eliminate this leaching.

The calculated contribution from the ANC C area is a mathematical estimate based on the assumptions adequately described in the FS text. Since PPPI's submission of its comments, it has conducted sampling in the ANC C area in early 2006 that confirms the presence of TCE contamination in both shallow and deep soils above the NJ IGWSCC. See EPA's responses to comments 14 and 15.

The soils types encountered beneath the ANC facility are variable and represent different permeabilities. See EPA's response to comment 12. Layers of sand were noted in several borings at the ANC site, which demonstrates the highly variable nature of the deposits. The subsurface soil cannot be considered an impermeable deposit. Surface water infiltration can enhance downward migration of contaminants through a soil column, but gravity-driven migration can also occur.

118) ***Page 138, Table A-3*** - On this Table, EPA lists its formulation of hypothetical additional area leaching TCE from soil to groundwater, i.e. ANC C. CERCLA and the NCP do not provide EPA with authority to hypothesize source areas requiring remediation. The NCP process requires a step by step investigation and analysis so that releases and threatened releases are characterized for remediation. Nowhere does the NCP say if you find no source, make one up.

EPA Response: The TCE contamination in the groundwater plume is not decreasing over time which indicates that an uncontrolled source of TCE exists. TCE was used at the former ANC facility and both EPA and PPPI have found TCE in soils and groundwater at the facility. As discussed above, PPPI has recently conducted sampling in the ANC C area that confirms the presence of TCE above NJ IGWSCC in both shallow and deep soils. Thus, further confirming that a TCE source exists at the ANC facility. EPA will conduct a supplemental soils investigation to confirm the nature and extent of contamination in and around the former ANC facility. Upon completion of the supplemental soils investigation a soils remedy will be documented in a ROD.

119) ***Page 159, last sentence on the page*** - In this sentence, EPA states that the pumping and injection at the former ANC property "do not appear to influence the local ambient hydraulic gradient." This statement contradicts EPA's RI assumption that the pumping and extraction at the former ANC property reversed the flow direction of the ground water so that naturally upgradient detection of TCE is asserted to have been caused by the naturally downgradient former ANC property. With this statement, EPA has eliminated the underpinnings of its argument that no

source of TCE upgradient of the former ANC property exists or existed.

EPA Response: The two statements are taken out of context and have nothing to do with each other. The former statement is attributed to the groundwater modeling scenarios for injection and extraction of groundwater related to a future remedial pump and treat system. It was concluded that a remedial pump and treatment system would not be negatively impacted by reinjection currently underway at the plant, and the overall hydraulic gradient over the area would similarly not be negatively impacted. This statement should not be construed as being related to the conclusion that the existing injection well currently operating at the ANC facility does not have a measurable local impact in the natural groundwater flow or gradient, which PPPI's own modeling has also confirmed to be the case.

120) ***Page 171, first paragraph under the heading "Modeling"*** - In this paragraph, EPA states that the TCE ground water plume is in a "steady state condition." As noted above, EPA lacks sufficient information to make such a statement. In addition, given the fact that TCE is not currently used at the former ANC property and any TCE detected in soils on that property has been removed over the past several years, it is difficult to understand how the plume could remain in a steady state. The only possibility seems to be sources beyond the former ANC property in conjunction with the fact that impacted soils identified at the former ANC property were never a significant source of TCE to the regional ground water.

EPA Response: The results of samples collected at the Vannatta Street and Dale Avenue wells (depicted in Figures 1-6 and 1-7 in the FS) support EPA's statement that the TCE in groundwater is in a steady state condition. TCE was first detected in the 1970's. While removal of TCE in soils at the former ANC facility over the last few years may have resulted in reduced leaching to the groundwater plume, the RI results indicate that significant groundwater contamination still exists.

See EPA's responses to comments 14 and 15 for a discussion of PPPI's recent sampling results that continue to show TCE above NJ IGWSCC at the facility. This indicates that significant soils source area(s) exist on the property and remain a source of groundwater contamination for the Site. These on-site source areas will be further investigated in order to fully characterize the nature and extent of soils contamination related to the former ANC property.

121) ***Page 172, first full paragraph*** - There is a typographical error. The phrase "The data is" should be "The data are."

EPA Response: EPA acknowledges the typographical error.

122) ***Page 173*** - In reviewing EPA's modeling of the time frames for the various remedial alternatives, it is clear EPA changed the location of the source area from modeling run to run. This would appear to preclude alternative to alternative comparisons of results as required by the FS.

EPA Response: The location of the source area was not changed for the various modeling runs.

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The downgradient location of interest for the model results did change because the various alternatives address different portions of the plume.

Comments on OU1 Feasibility Study Modeling

General Comments:

123) The methods used to estimate total mass and mass flux greatly oversimplify the complex geology and hydrogeology of the Site. The soil and groundwater are modeled as homogeneous compartments with single input parameter values selected to represent the entire volume. Throughout the RI and FS, the hydrogeologic complexities of the Site are discussed; however, there is no attempt to account for this complexity in the total mass and mass flux calculations. For example, the RI states, "Groundwater in the bedrock occurs mainly within voids, fractures, and bedding planes in the rock. Karstic features such as large-scale voids were encountered at several bedrock monitoring locations." [RI P. 84]. Since preferential pathways predominate in karst bedrock, modeling the bedrock as a homogeneous porous medium is inappropriate.

EPA Response: The modeling conducted for the FS was focused on providing a basis from which various groundwater pumping scenarios could be evaluated and compared. The documented model calibration results indicate that the model used provided an adequate match to the field data. Furthermore, the model verification process demonstrated good correlation with site-specific groundwater data.

The purpose of the total mass and mass flux calculations in the FS was to determine an order of magnitude estimate for cost estimating purposes. It is acknowledged that the geology at the Site is complex; however, the modeling was completed to allow for a general understanding of the mass of contamination in groundwater.

Given the objectives of the feasibility study to evaluate various remedial alternatives and develop order of magnitude cost estimates for their implementation, the use of simplifying assumptions is a necessary and accepted step in the feasibility study process. Both EPA's and PPPI's groundwater flow modeling of the Pohatcong Valley and the former ANC facility, respectively assume the limestone aquifer is an equivalent porous medium. Although the model code employed by Environ can account for heterogeneity in aquifer conditions, an explanation of how heterogeneity was applied to the model is missing from the report. Thus, PPPI's approach to analyzing site conditions is similar to EPA's.

124) In the modeling, numerous non-Site specific parameters were used without any basis as to their applicability or relevance to actual Site conditions. The use of such values results in total mass and mass flux estimates with high degrees of uncertainty.

EPA Response: See EPA's response to comment 127. The comment is general, and fails to identify specific instances where non-site specific parameters were applied erroneously or without

justification. The non-site specific and site specific parameters that were used in the calculations are identified in the FS (Appendix A - Tables A-1 through A-4). Literature-based and experimental values were used only when site specific parameters were not developed from investigation work performed at the site. Non-site specific parameters were evaluated for their applicability to hydrologic and geochemical conditions at the site before they were used in the calculations. Uncertainty is inherent to these calculations and to groundwater flow and contaminant transport modeling results. Subsequently, model input parameters were selected to minimize uncertainty in the modeled solutions.

125) A quantitative analysis of uncertainty (potential range of values) and statistical confidence intervals are not provided. Uncertainty in the input parameters can have a major affect on the output values of the model/calculations as discussed below.

EPA Response: As acknowledged in Appendix D, there is uncertainty in the estimates of time to remediation. The importance of the estimates is the relative comparison between alternatives. As a result it is less important to consider the sensitivity of the estimates to variations in input parameters.

126) The sensitivity of the total mass and mass flux calculations to changes/variations in the input parameters has strong implications with respect to the Site's conceptual model of contaminant fate and transport and the identification of sources areas contributing to groundwater contamination. These in terms have fundamental implications for remedial selection decisions.

EPA Response: See EPA's response to comment 123.

Specific Comments:

127) ***Table A-1. TCE Mass Flux Leaching from Soil to Groundwater (FS page 136).***

- 1) The area of ANC A is reported as 28,000 ft2. The basis for this number is identified on page 134 as the FS Report, Figure 2-1. On Figure 2-1, the area exceeding PRGs for Area A is identified. Using the scale presented on the Figure, the area is approximately 18,653 square feet [area of ellipse = length x width x pi / 4 = 237.5 ft x 100 ft x pi/ 4 = 18,653 ft2]. Leaving all other parameters constant, the TCE mass flux value is then decreased by over 30% (from 44 lbs/yr to 29 lbs/yr)when the area is changed from 28,000 to 18,653 ft2. EPA is not even consistent in its construct of ANC A or mass flux throughout its own RI/FS.

EPA Response: The ANC A area ellipse was drawn as a general approximation of the impacted soil area and includes the area below the railroad track to the northwest to include the area surrounding PVANC32. This area is 28,000 square feet (sf). As identified in the FS Report, EPA recognized that this area will require further delineation to confirm the lateral extent of the contamination (see EPA's response to comment number 2 below.)

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- 2) The average soil concentration of 6,300 ug/kg is not supported by the data. The characterization of ANC A is based on five samples presented in Figure 2-1 of the FS Report: PVANC25, PVANC32, PVANC33, PVANC39, and PVAC106. The sample depths exceeding PRGs for these five locations are presented in Figure 1-3 of the FS Report. The full Data set for these locations is presented in the RI pages 139-140 and 165-170. The deepest sample detected above PRGs was found at 15 feet. Only one location, PVANC39, was sampled below 15 feet. At this location, concentrations of 110 and 29 ug/kg were observed at depths of 16 and 81 ft., respectively. In the northern portion of ANC A, the arithmetic average concentration from 15 ft to 81 ft (deepest sample collected) is less than 100 ug/kg [15ft:PVANC32=260 ug/kg, PVANC33=7 ug/kg, PVANC39=13 ug/kg; 16ft: PVANC39=110 ug/kg; 81ft: PVANC39=29 ug/kg.] These data do not support an average soil concentration of 6,300 ug/kg within ANC A. If the actual data were used, a much smaller mass of TCE would have resulted.

EPA Response: The average TCE soil concentration of 6,300 ug/kg is based on the arithmetic average of 15 soil samples from the following soil borings: PVANC24, PVANC32, PVANC39, PVANC25, PVANC33, and PVAC106. Revision of the mass flux calculation is not necessary because the larger area contributes to the TCE mass flux to groundwater and the 15 samples were used to estimate the average TCE concentration. A thickness of 100 feet was estimated based on the prevalence of contamination in soil and perched groundwater zones sampled and the presence of TCE in the regional groundwater zone immediately below this area. EPA stated in the FS Report that further investigation will need to be completed to further define the lateral and vertical extent of contamination.

- 3) A non-Site specific value of 0.002 g/g is used for the fraction of organic carbon (hereinafter "foc") in soil. A different non-Site specific foc value for soil, 0.006 g/g, was used in Appendix R of the RI (page 3666). No explanation is provided as to why the differing foc values were used in these two applications. The uncertainty associated with this value has a major affect on the estimated TCE mass flux. For example, the TCE mass flux value is decreased by nearly 67% (from 44 lbs/yr to 15 lbs/yr) when foc is changed from 0.002 to 0.006 g/g (Leaving all other parameters constant). In addition, these values are not Site-specific. Site-specific values, which would have given a more realistic assessment of the Site, were not developed.

EPA Response: The foc values were based on the EPA and NJDEP default values for the two different applications. In the absence of data, standard default values are used and are considered appropriate for this site and application. The appropriate values were selected. Also see the response to the bullet comment immediately below.

- 4)A non-Site specific value of 126 mL/g is used for the organic carbon partition coefficient (hereinafter "Koc"). A different non-Site specific Koc value, 166 mL/g, was used in Appendix R of the RI (page 3666). No explanation is provided as to why the differing Koc values were used in these two applications. The uncertainty associated with this value has a major affect on the estimated TCE mass flux. For example, the TCE mass flux value is decreased by nearly 25% (from 44 lbs/yr to 33 lbs/yr) when Koc is changed from 126 to

166 ml/g (Leaving all other parameters constant).

EPA Response: The Koc values were based on the EPA and NJDEP default values for the different applications. Regarding site-specific calculation of foc and Koc, EPA did not perform the specific testing analyses required to obtain these values. Therefore EPA used default values provided by the NJDEP and EPA guidance. Since the FS was prepared from PRGs defined by the NJDEP, EPA used NJDEP foc and Koc default values for the TCE mass calculations. Since the Human Health Risk Assessment was prepared using EPA guidance, EPA default values were used. While use of these different values can skew the results in one direction or another, they are somewhat moot now because TCE has been detected beneath the building from direct sampling at multiple depths and at concentrations that exceed the NJDEP IGWSCC. Therefore, there is no need to speculate about contamination under the building, nor estimate a TCE mass from data extrapolated from other locations. In addition, there will be additional soil sampling performed prior to selecting a remedy, therefore, making moot the time and expense of performing the additional tests that would have been required to calculate site specific foc and Koc values, which would have yielded only limited data having limited applicability.

- 5)The area of ANC A is reported as 28,000 ft2. The basis for this number is identified on page 134 as the FS Report, Figure 2-1. On Figure 2-1, the area exceeding PRGs for Area A is identified. Using the scale presented on the Figure, the area is approximately 18,653 square feet [area of ellipse = length x width x pi / 4 = 237.5 ft x 100 ft x pi / 4 = 18,653 ft2]. Leaving all other parameters constant, the TCE mass flux value is then decreased by over 30% (from 44 lbs/yr to 29 lbs/yr) when the area is changed from 28,000 to 18,653 ft2. EPA is not even consistent in its construct of ANC A or mass flux throughout its own RI/FS.

EPA Response: The ANC A area ellipse was drawn as a general approximation of the impacted soil area and includes the area below the railroad track to the northwest to include the area surrounding PVANC32. This area is 28,000 sf. The figure was developed only to aid in costing the remedy for purposes of the FS. As identified in the FS Report, the EPA recognized that this area will require further delineation to confirm the lateral extent of the contamination.

128) ***Table A-2. TCE Mass Flux within Groundwater (FS page 137).***

- The plume widths and thicknesses are not supported by the data.

EPA Response: Plume thicknesses and widths are based on the results of the RI, and support by data. See EPA's response to comment 115.

- ***(128 con't.)*** Assigning a single effective porosity (ne) value of 0.15 to represent the entire bedrock volume does not accurately account for heterogeneity within the bedrock and is inconsistent with Site observations. The affect of porosity on contaminant transport within the bedrock was investigated in the RI (page 663), which states, "To simulate a fractured

bedrock terrain, Rf [retardation factor] values were generated from porosities ranging from 0.02 to 0.25. The RI concludes that "... a wide range of Rf values could occur in the carbonate aquifer that are very sensitive to aquifer porosity." The uncertainty associated with this value has a major affect on the estimated groundwater TCE mass flux.

EPA Response: While a wide range of effective porosity is certainly possible, and likely, given the aquifer heterogeneities, the estimated value represents a reasonable estimate for the aquifer as a whole based on the historical migration of TCE.

- *(128 con't.)* Assigning a single hydraulic conductivity value of 33 ft/day to represent the entire bedrock volume does not accurately account for heterogeneity within the bedrock and is inconsistent with Site observations. Site-specific values of hydraulic conductivity ranged from 0.01 ft/day to 1405 ft/day (RI p. 2015), or six orders of magnitude. The uncertainty associated with this value has a major affect on the estimated groundwater TCE mass flux. EPA acknowledges that its modeling is sensitive, though the sensitivity is not quantified and results are stated as if they are definitive.

EPA Response: The groundwater flow model in the RI report underwent rigorous calibration, verification, and evaluation, including quantification of the sensitivity of input parameters. Application of an analytical model code required selection of single hydraulic input parameters (transmissivity, storage coefficient, aquifer thickness) to represent the regional aquifer in the study area. Thus, although an analytical model cannot consider heterogeneity, or anisotropy, the model developed for the regional aquifer achieved a high degree of calibration success (less than 3.0 feet of difference at calibration points) at steady state, and was verified to transient conditions by comparison with actual long term aquifer test data.

The successful calibration and verification for the groundwater flow model indicates that the application of the hydrologic parameters were reasonable for the bulk characteristics of the regional aquifer, including hydraulic conductivity. Site-specific hydraulic conductivity values described in the comment were derived from methods (slug tests, packer tests, lab test) that test a limited, minor portion of the regional aquifer. These methods are subject to anomalies in well construction and other factors, thus yielding a range of values that don't reflect regional characteristics of the aquifer.

- *(128 con't.)* Assigning a single, non-Site specific TCE retardation value of 1.47 ft/day to represent the entire bedrock volume does not accurately account for heterogeneity within the bedrock and is inconsistent with Site observations. The RI states that "... a wide range of Rf [retardation factor] values could occur in the carbonate aquifer that are very sensitive to aquifer porosity." (RI page 663). The retardation factor value of 1.47 is outside of the range presented in the RI of 1.57 to 11.28 (RI page 663). The uncertainty associated with this value has a major affect on the estimated TCE mass flux. For example, if the arithmetic average of the range presented in the RI (6.4) is used to calculate the TCE mass flux (keeping all other parameters constant) the original TCE mass flux of 310 pounds/year

is decreased by 77% to 72 pounds/year.

EPA Response: See EPA's response immediately above. In addition, the TCE retardation factor is a reasonable estimate given the historical migration of the TCE plume.

129) ***Table A-4. Estimated TCE in Soil and Groundwater (FS page 139).***

- The plume widths and thicknesses are not supported by the data.

EPA Response: This is a repetition of comment 128 above. See EPA's responses to comments 115 and 128.

- ***(129 con't.)*** As discussed above, the data do not support an average soil concentration of 6,300 ug/kg to a depth of 100 ft. The characterization of ANC A is based on five samples presented in Figure 2-1 of the FS Report: PVANC25, PVANC32, PVANC33, PVANC39, and PVAC106. The sample depths exceeding PRGs for these five locations are presented in Figure 1-3 of the FS Report. The full data set for these locations is presented in the RI pages 139-140 and 165-170. The deepest sample detected above PRGs was found at 15 feet. Only one location, PVANC39, was sampled below 15 feet. At this location, concentrations of 110 and 29 ug/kg were observed at depths of 16 and 81, respectively. In the northern portion of ANC A, the arithmetic average concentration from 15 ft to 81 ft (deepest sample collected) is less than 100 ug/kg [15ft: PVANC32=260 ug/kg, PVANC33=7 ug/kg, PVANC39=13 ug/kg; 16ft: PVANC39=110 ug/kg; 81ft: PVANC39=29 ug/kg.]

EPA Response: This is a repetition of comment 127 above, see EPA's response to that comment.

- ***(129 con't.)*** The area of ANC A is reported as 28,000 square feet. The basis for this number is identified on page 134 as FS Report, Figure 2-1. On Figure 2-1, the area exceeding PRGs for Area A is identified. Using the scale presented on this figure, the area is approximately 18,653 square feet [area of ellipse = length x width x pi / 4 = 237.5 ft x 100 ft x pi / 4 = 18,653 ft2].

EPA Response: This is a repetition of comment 127 above, see EPA's response to that comment.

130) All of the modeling comments demonstrate the weaknesses of EPA's modeled conclusions about mass and mass flux. It is these problematic EPA conclusions which have been used to rationale the FS remedial evaluation. As demonstrated here, EPA should not have disregarded actual data and relied on assumption in formulated remedial options. Its approach does not meet NCP requirements.

EPA Response: The comments provided are general and are not supported by specific examples. The model input parameters were as described in EPA's RI and FS reports and the model efforts

are supported by site-specific data where available. Based on the available data, appropriate modeling methods (analytical) were applied for groundwater flow and contaminant transport simulations. The approach and methods used have been applied successfully at other sites and are not inconsistent with NCP requirements. Subsequently, modeled solutions are valid for evaluating remedial alternatives. Additional data to further refine the model solutions will be collected during the RD phase of the remedy.

Draft Proposed Plan

OU1 Area

EPA issued its draft Proposed Plan on July 27, 2005 with a public comment period ending on August 26, 2005. That comment period was subsequently extended to September 26, 2005. Therefore, the comments presented herein must be considered timely submitted and must be included within the official administrative record for the "Pohatcong Valley Ground Water Contamination Site." The draft Proposed Plan is based on EPA's RI/FS for the Site so the comments on those documents included herein are relevant to the draft Proposed Plan as well and are incorporated herein by reference as Proposed Plan comments.

131) ***Page 2, first column under the heading Soil*** - EPA states that the Agency's and NJDEP's preferred soil remediation alternative is SO3 involving Dual Phase Extraction and limited shallow soils excavation. In support of this proposed remedial selection, EPA concludes that SO3 will "minimize leaching of TCE to ground water, prevent risks from direct contact and limit erosion of contaminated soils." However, as to assumed area ANC C, the building would minimize any leaching and prevent direct contact with sub-building soils. Erosion is prevented by the building as well. Therefore, since EPA's stated remedial goals have already been achieved as to assumed area ANC C, no further soils action is needed with respect to that area. This aspect of the proposed remedy should be eliminated.

On page 12 of the Proposed Plan, EPA acknowledges that SO2, which entails capping and institutional controls, would meet site-specific ARARs at a much lower cost then the proposed SO3. Therefore, SO2 is the more appropriate remedial approach in this instance.

EPA Response: As stated throughout, EPA is not selecting a soil remedy at this time, as had been outlined in the Proposed Plan. EPA will instead proceed only with implementation of the selected groundwater remedy portion that had been outlined in the Proposed Plan. The soils will be handled in a subsequent phase of work. See EPA's responses to comments 77, 93, and 120 for a discussion of the steady state of the TCE groundwater contamination in the OU1 Study Area. Previous studies and remediation activities conducted by ANC and PPPI under oversight of the NJDEP have detected TCE concentrations of up to 400 ppm in shallow soils in the ANC C area. Furthermore, as discussed in EPA's responses to comments 14 and 15 above, PPPI's recent 2006 sampling has found TCE contamination above NJ IGWSCC in both shallow and deep soils in the ANC C area. The soil source areas will undergo further investigation to define the nature and

extent of contamination prior to selection of a soil remedy.

132) ***Page 3, third full paragraph*** - In this paragraph, EPA reviews its process of elimination from the 107 originally identified possible source areas to three. EPA fails to note that of the 107 originally identified, some were eliminated on the basis of a few soil gas samples or a couple of soil samples. None were thoroughly investigated prior to EPA's decision to delete them as possible source areas.

EPA Response: It is EPA's opinion that sufficient data was collected and analyzed in order to verify or eliminate potential source areas impacting the site. See also EPA's response to comment 2.

133) ***Page 4, fifth full paragraph*** - Here EPA makes the statement that:

> "It should be noted that a greater amount of TCE contamination has been detected in groundwater than could be accounted for entirely from the two ANC soil source areas identified."

First of all, there are not "two ANC soil source areas identified." EPA assumes that ANC A is from the former ANC property; no data exists to confirm that conclusion. In fact, presently available data indicates that the former ANC property is not the source of impacts at ANC A.

Secondly, having reached this conclusion about the insufficiency of sources on and near the former ANC property, EPA does not look elsewhere for possible sources of TCE impacts. Instead, EPA simply creates a source area (in the absence of any data), of the necessary size to support EPA's assumptions about the annual contribution of TCE to the plume. EPA places that assumed source beneath the former ANC plant building speculating that TCE found in shallow soils (none beneath 6.5 feet) in AOC 7 represents part of a larger impacted area. That view ignores data which defined the extent of TCE as stopping at the building edge rather than continuing beneath the building. It also ignores the fact that data from AOC 7 does not show TCE deeper than 6.5 feet on the former ANC property. This approach also ignores the finding of TCE impacts upgradient of the former ANC property, as well as the likelihood of TCE sources at other locations such as the Vikon Tile, Five Carp Company or Tung-Sol properties.

EPA Response: The highest concentrations of TCE detected in soil during the OU1 RI were found at ANC, and an area immediately adjacent to ANC, known as AC1. See also EPA's responses to comments 9 and 20. These PSAs were identified as potentially significant source areas based on a comparison of the TCE soil concentrations to the New Jersey Impact to Groundwater Soil Cleanup Criteria (IGWSCC) of 1 part per million (ppm). The areas of contamination requiring soils cleanup, referred to as areas "ANC A" and "ANC B", contained maximum concentrations of 52 ppm and 3 ppm of TCE, respectively. The estimated surficial aerial extent of ANC A is approximately 28,000 square feet, and for ANC B, approximately 2,000 square feet. ANC B exhibits impacts at shallow depths (less than 5 feet), while it has been assumed based on soil

sample data that ANC A contains contamination in the unconsolidated zone to a depth of bedrock at 100 feet. These estimations are based on sampling conducted to date; the exact extent of soil contamination at the source areas will be delineated during the supplemental soils investigation, prior to selection of the soil remedy.

EPA acknowledges that there may be other minor sources of TCE groundwater contamination; however, it should be noted that both the Five Carp Company and Tung-Sol properties have been evaluated and no TCE was detected at either. As noted in the EPA's response to comment 12, EPA drilled deep borings and installed monitoring wells at the locations of the former waste lagoons at the Five Carp Company facility and no TCE was detected in the soil. Soil samples collected from numerous locations and depths at the Vikon Tile property did not contain TCE at concentrations above cleanup criteria. Additional investigations are currently being conducted at the direction of Washington Borough, and their results will be considered during the supplemental soils investigation. Investigations were conducted at properties upgradient from the ANC facility and no chlorinated VOCs were detected in the soil samples collected. These PSAs include Reds Auto Body and Washington Mechanical.

134) ***Page 4, third full paragraph*** - In this paragraph, EPA lists the numbers of samples it collected from various media within the Site. However, the Site is an 8.75 square mile or 5,600 acre area. That means, for example, that EPA took .027 soil samples per acre. Only .071 borings were installed per acre of Site and only .051 ground water samples were collected per acre. This means that for a significant portion of the Site, no samples of either soil or ground water were collected. Yet, virtually the entire Site has been ruled out as possible source areas.

EPA Response: The statistics provided by PPPI and the ratio of land area to the number of samples collected are not relevant. As discussed in the RI Report, EPA focused its investigation on specific potential source areas based on a variety of criteria including but not limited to whether the facility presently or in the past utilized chlorinated solvents in their operations. In addition, the selected PSAs are located throughout the Pohatcong Valley both upgradient and downgradient of groundwater flow, and cover enough of this 5,600 plus acre area to provide good representative data.

135) ***Page 5, first full paragraph under the heading "Groundwater Contamination"*** - EPA states that TCE has migrated through unconsolidated soils into the regional aquifer. If that is the case, data shows that the former ANC property is not a significant source of the TCE in the regional ground water. For example, EPA has concluded that ANC B extends to a depth of only five feet; ground water is over 100 feet deep. Similarly, sampling at the former ANC property has shown that TCE does not extend deeper than 6.5 feet. Given those data, there is no evidence that the TCE could have reached the regional aquifer, which is over eighty feet below, through low permeability soils leaving no traces behind.

EPA Response: The highest concentrations of TCE detected in soil were found at the former ANC facility, and at an area immediately adjacent to ANC. These PSAs were identified as potentially

significant source areas based on a comparison of the TCE soil concentrations to the New Jersey Impact to Groundwater Soil Cleanup Criteria (IGWSCC) of 1 part per million (ppm). See also EPA's responses to comments 9, 14, 15, 20 and 28. The source areas are in proximity to the highest concentrations of TCE detected in groundwater. The source areas will undergo further investigation and delineation.

136) ***Page 5, first full paragraph under the heading "Groundwater Contamination"*** - EPA notes that 2100 ppb of TCE was detected immediately downgradient of the former ANC property. What EPA fails to mention is that detection was on the Vikon Tile property which was reported to have been the site of significant solvent use and liquid waste disposal in its own right. The Vikon Tile operations could be the source of some or all of this TCE concentration. Furthermore, the detection of the 2100 ppb was not "immediately downgradient" of the former ANC property. If EPA's conclusion that the regional ground water flows to the southwest is correct, Vikon Tile is side-gradient to the former ANC property.

EPA Response: Vikon Tile was not considered to be a source of TCE groundwater contamination, partly because no TCE was detected in the soils at this location during the RI. The regional ground water flow is to the southwest; however, identification of the Vikon Tile site as "side-gradient" to the former ANC property is misleading. Based on the regional groundwater flow, Vikon Tile is correctly considered immediately downgradient, and well PVVTC15, containing the highest concentration of TCE recorded during the RI (2100 ppb) , is within 150 feet of the southern fence line of the ANC property. A boundary line survey would determine whether the ANC property directly abuts part of the Vikon Tile property. If new data becomes available that changes the current understanding of this PSA, then EPA will review the new data and take appropriate action.

137) ***Page 6, first full paragraph*** - This paragraph mischaracterizes the potential risks associated with TCE impacts on domestic residential wells. As pointed out on page 4, EPA screened, tested and evaluated 35 residential wells. Potential risk estimates in excess of EPA target levels were characterized in only 2 wells, located within a relatively small area. The investigation and risk assessment confirm that the area has been widely studied and treated municipal water supplied to eliminate potential exposure risks. Even hypothetical risks from TCE are limited to a small fraction of the area.

EPA Response: The potential risks associated with TCE impacts on domestic residential wells was not mischaracterized in the Proposed Plan. The Proposed Plan contains a summary of the work conducted during the RI and the Human Health Risk Assessment (HHRA) results. The results of the HHRA indicate that acceptable risk levels in groundwater and in domestic wells have been exceeded. Risks associated with groundwater were evaluated for use as potable water, for limited irrigation, and for other domestic uses. A description of the potential risks is appropriately included in the Proposed Plan. Though the use of residential wells as potable water sources within the OU1 Study Area has been reduced or eliminated through implementation of the NJDEP Well Restriction Area, and the public is supplied with a potable water supply which requires water treatment prior to distribution; these measures are not sufficient to meet the Remedial Action

Objectives of remediating the groundwater and restoring the aquifer to drinking water quality.

Though only 2 of the residential wells sampled were contaminated with TCE at or above 1 ppb, there is a large area of groundwater contamination above the 1 ppb criteria, that extends throughout much of the Valley based on the results of extensive monitoring well sampling. It was not the purpose of the RI to present an exhaustive sampling of residential wells or use residential wells to define the nature and extent of the groundwater contamination. Both of the public water supply wells are contaminated at levels that exceed drinking water standards, and have been rendered unfit for drinking water use without treatment. New wells cannot be developed in this area without treatment.

It should also be noted that the referenced paragraph summarizes the results of the HHRA and accurately depicts that there are potential risks and hazards that exceed USEPA acceptable ranges from potential exposure to groundwater in both the generalized plume and from domestic wells located within the plume. The text further explains that impacts are currently being mitigated through treatment of contaminated water by the municipal water company, a practice required by the Safe Drinking Water Act, but this treatment prior to distribution does not meet the Remedial Action Objectives described above. Currently, the contaminated plume (i.e., groundwater that exceeds New Jersey Drinking Water criteria) is present throughout the approximately 5 miles of the OU1 estimated length, which clearly indicates that the risks and hazards associated with TCE are not limited to a small fraction of the area.

138) ***Page 6, third full paragraph*** - This paragraph simply misstates the conclusions of the risk assessment in an attempt to justify the proposed soil cleanup activities at the ANC site. Contrary to the representation made here, the risk assessment states (in reference to the ANC site) that "there are no hazards or risks above EPA target levels based on samples collected at the site for current site use, or future industrial use (p 561)." Even for other hypothetical future uses, including residential, there are no cancer risk estimates in excess of the EPA target range for ANC soils. Further, TCE and other contamination associated with industrial use play no role whatsoever in the risk profile for soil.

The only significant risk estimates are calculated for naturally occurring metals, with the highest risks ascribed to iron. EPA goes out of its way in the RI and risk assessment to point out that iron and other natural soil minerals are likely to be present due to natural background conditions, and that the calculated risk estimates reflect the intentional protectiveness of the exposure and toxicity assumptions used in quantitative risk assessment. Then the characterization in this paragraph of the Proposed Plan states, "the hazards and risks associated with these areas are primarily from the inhalation of TCE vapors...." There were NO significant risks calculated in association with proposed soil remediation areas pertaining to TCE vapors, much less were any risk estimates driven primarily by this compound. The risk assessment indicates relatively modest potential risk estimates relating primarily to natural background minerals in specialized hypothetical exposure scenarios, yet the Proposed Plan attempts to justify the soil cleanup on the basis of TCE vapor risks. This misrepresentation is inappropriate and clearly inconsistent with CERCLA and the NCP.

The text goes on to state, "the primary human exposure pathways for TCE in soils are direct contact with soils, or inhalation of vapors from the unsaturated zone soils," implying that such exposures represent significant risks in this case. Again, this is categorically contradicted by the risk assessment results purported to back up the proposed soil remedy. TCE was eliminated from consideration in some pathways because soil concentrations were not even detected and eliminated from consideration in others because the maximum-detected value was below the most stringent EPA screening level. Further, in the few pathways where TCE levels were sufficient to warrant quantitative risk assessment, the results clearly show that this compound was not quantitatively significant in the calculation of the risk estimates and was present at concentrations well below the cancer and non-cancer risk targets. PCE was never even included in any quantitative risk estimates for soil in the proposed cleanup areas.

Despite the clear findings of the risk assessment that TCE and PCE are not important factors in potential risks related to soil, the proposed plan juxtaposes the quote above with a poorly characterized description of effects from TCE and PCE intended to further substantiate the proposed soil remedy by highlighting the hazards of chemicals that were not even important to the soils risk assessment outcome. The potentially significant soil risks were limited to hypothetical future use scenarios and driven primarily by iron, aluminum and manganese present, per EPA repeated characterizations, as part of the natural mineral content of the area.

EPA Response: PPPI fails to understand the distinction of the risk assessment results and the identification of targeted remedial soil cleanup areas. The targeted soil cleanup areas were identified based on NJDEP soil cleanup criteria introduced on Page 4 and described as a remedial goal on Page 8 of the Proposed Plan. The remedial goals were the drivers for the soil cleanup.

The human health and ecological risks are summarized in the Proposed Plan and the statements presented are consistent with the information presented in detail in the Remedial Investigation (RI) Report. The EPA made a clear distinction in the RI Report that the Risk Assessment for the ANC area excluded the ANC-related soil samples collected outside the ANC fenced area. These ANC-related soil sample results from outside the fenced area were considered under a trespasser scenario, which did not include construction, industrial, or residential risk scenarios.

The Proposed Plan refers to the targeted remedial soils cleanup areas, which includes the ANC area along the railroad spur outside the fence line. The ANC data grouping in the risk assessment included only samples from within the ANC fence line. The area the Proposed Plan is referring to was evaluated in the risk assessment as part of Trespasser Area 1. Trespasser Area 1 includes data from unfenced areas at ANC, AC1, and VTC. This area is accessible to potential trespassers along the adjacent railroad track and evidence of trespasser activities, such as foot paths, have been observed in the area. The only receptors evaluated in the risk assessment for Trespasser Area 1 were adolescent trespassers. There were no elevated risks associated with TCE to the adolescent trespassers. However, the concentrations of TCE detected in Trespasser Area 1 exceed the NJDEP IGWSCC cleanup level. Although not calculated in the risk assessment, the risks to the construction worker would exceed EPA target risk levels if construction work is conducted in the

area designated as Trespasser Area 1. Exposure to soil within Trespasser Area 1 was not evaluated for a construction worker since no construction activities were occurring at that time, and it was assumed this area would not be developed in the future precluding future construction activities. However, new information has come available that indicates the property may be developed, and the potential new property owner has been advised that the contaminated area is off limits to all construction activities. EPA will be performing additional soil investigation work in the vicinity of the ANC PSA, and will prepare a new risk assessment for soils upon completion of the upcoming phase of field work.

EPA prepared a comprehensive risk assessment for the Site. EPA's risk assessment analyzed all data collected during the RI, in accordance with EPA's Risk Assessment Guidance for Superfund, and the same standard has been applied throughout the Site and to all of the PSAs evaluated during the OU1 RI/FS within the Pohatcong Valley. As clearly stated in the RI and the Proposed Plan, the focus of the RI/FS is chlorinated VOCs, specifically TCE and PCE due to the extensive contamination of the regional drinking water aquifer. All of the PSAs, however, were evaluated for a full suite of VOCs, SVOCs, and metals. Since the contaminants of concern in the groundwater and soil are TCE and PCE, and the risk assessment demonstrated that risks posed by these contaminants were unacceptable in groundwater, EPA is selecting a remedy for groundwater in this action. Though EPA is presently focusing on the TCE and PCE groundwater contamination as part of this action, the soils source areas, as they pertain to the TCE and PCE contamination, will be addressed in a subsequent ROD after completion of a supplemental soils investigation. As pointed out by the above comment and in the RI, a number of other compounds were detected at certain facilities at levels posing unacceptable risks under EPA's guidance. Additional contaminants such as PAHs and arsenic have been identified in the soils at various PSAs; however, they are not elevated in groundwater and have not historically impacted the public water supply wells. EPA will continue to monitor these contaminants as part of the selected groundwater remedy. EPA has targeted the remediation of groundwater at the Site based on risk or exceedance of the selected remediation goals for TCE and PCE (i.e., GWQS). PSAs with groundwater or soils that exceed the NJDEP IGWSCC or GWQS for non-chlorinated VOCs, SVOCs or metals, have been identified in Section 5.11 of the RI Report, and the risks have been calculated in the risk assessment, which have been reviewed by NJDEP and are part of the public record. EPA will provide the results of the RI and risk assessment to the property owner of each facility demonstrating an unacceptable risk due to contaminants other than TCE and PCE, as well as to local authorities.

PCE contamination in soil was considered in the RI risk assessment, although it was not found at concentrations that were above risk criteria. Also, PCE was not found in soil at concentrations above the NJDEP IGWSCC, which was identified as a remedial goal. Therefore a PCE remedial target soil area is not considered in the Proposed Plan.

Regarding the last paragraph of the comment, the discussion of the health effects associated with TCE and PCE are not presented to justify the soil remedy. They are included for the reader's benefit to provide a brief summary of the health effects associated with the chemicals that are

reported in the literature.

139) ***Page 6, column 2*** - The descriptions of potential health effects from risk driving chemicals are incomplete and, with regard to TCE and PCE, substantially inadequate. Descriptions of potential health concerns in a Proposed Plan are expected to correspond to the chemicals driving the estimated risks in the area as defined in the RI. In this case, no information on any of the chemicals relevant to potential soil exposure (e.g., iron, aluminum, etc.) is presented and only information on TCE and PCE is included. Roughly equivalent coverage of all chemicals purported to be primary risk drivers should be incorporated.

Further, the descriptions provided regarding TCE and PCE do not make clear the vast differences in exposure dose relevant in this situation. Descriptions of effects from exposure to high levels of TCE and PCE vapors and in drinking water are provided, implying that such exposure levels could be relevant. While in one reference the text specifies "large amounts of TCE (greater than what has been detected at the site)," in other references, particularly with regard to inhalation, the non-specialist reader is given no context to understand that the "high concentrations" and "small amounts" of TCE referred to are not only outside the range relevant to the Site, but many hundreds to many thousands of times higher than concentrations associated with the Site. In each paragraph, a rough, order of magnitude expression of the relevant doses being described and, importantly, a contrast with the soil, water, and estimated airborne concentrations associated with the Site must be included to clarify the typically vast safety factor between the environmental levels and the levels needed to produce the acutely poisonous effects described.

EPA Response: The discussion of the health effects associated with TCE and PCE are included to provide a brief summary of the health effects associated with the chemicals that are reported in the literature. The values associated with the cancer risk and non-cancer hazards provide the necessary measure regarding the potential for adverse health effects due to exposure. See EPA's responses to comments 66 and 138.

140) ***Page 7, paragraph under heading "Remedial Action Objectives"*** - EPA estimates that 163,000 cubic yards of soil have to be treated to achieve the Remedial Action Objectives. That estimate is based on a series of unsupported assumptions, perhaps the greatest of which is the existence of ANC C. Not only has EPA assumed the existence of this source area, but the Agency has proscribed dimensions and now a soil volume to the area. In addition, EPA has assumed the lateral extent of ANC B since only one sample location exists for that area. ANC A's size is also based on inadequate characterization data as to both depth and lateral extent. It is clearly arbitrary and capricious for EPA to set out a proposed remediation for soils only assumed to be impacted.

EPA Response: See EPA's responses to comments 14, 15, and 85 for information on the ANC source areas. EPA is not selecting a soil remedy at this time, but will select a soil remedy in a ROD upon completion of a supplemental soil investigation.

141) ***Page 8, fifth full paragraph*** - In this paragraph, EPA acknowledges that it has simply

presumed ANC C into existence. EPA agrees that it has not identified sufficient TCE contamination at the former ANC property to explain the ground water conditions at the Site. When EPA did not find a source area for the PCE plume, it assumed that the source area no longer existed and did not propose soil remediation. Here, EPA takes a different tact, assuming a source of a size-certain exists, and seeking remediation of its assumed sources. No explanation of the inconsistency in these approaches is provided by the Agency.

EPA Response: See EPA's responses to comments 14 and 15 for a discussion of PPPI's recent sampling in the ANC C area that confirms TCE contamination above NJ IGWSCC in both shallow and deep soils. The geographic scale and contaminant concentrations for the TCE and PCE detected within the Pohatcong Valley are significantly different and were the main drivers for how they are described in the RI Report and how they are addressed in the FS Report. Soils contamination with PCE, and the majority of groundwater contaminated by PCE, is limited to a small area of Washington Borough. The area encompassing the highest PCE concentrations within the groundwater plume (e.g., the 25 ppb isoconcentration contour) measures roughly 1,000 feet by 500 feet. In contrast, the area encompassing the highest TCE concentrations within the groundwater plume (e.g., the 500 ppb isoconcentration contour) measures roughly 8,000 feet by 2,500 feet. To equate this dimensionally, the TCE concentration of a similar area as the 25 ppb isoconcentration contour for PCE, is 500 ppb, or about 20 times greater. Also, none of the PCE concentrations detected in the soils exceeded the NJDEP IGWSCC, so no soil remediation is required. In contrast, several locations of TCE contamination exceeded the NJDEP IGWSCC and require remediation. Lastly, attenuation of the PCE concentrations in groundwater appears to be occurring at a higher natural rate (i.e., Vannatta Street well time series) than the TCE concentrations in groundwater (i.e., Dale Avenue well time series).

142) ***Page 9, Soil Alternatives*** - The soil alternatives should each be reviewed and the potential risk reduction and required risk management should be re-stated consistent with the lack of any significant risks from TCE, PCE or other non-background chemicals. Where there are no significant risks, the costs and difficulties of soil management strategies are not justified since they do not serve the required CERCLA and NCP FS criterion of controlling relevant risks.

EPA Response: The soil alternatives were evaluated properly in accordance with the NCP. A central requirement of the NCP is to return useable groundwater to concentrations below drinking water standards in a reasonable time. The soil alternatives were developed to reduce the continued leaching of the VOCs to groundwater so that this requirement of the NCP can be met. A soils source remedy will be documented in a ROD upon completion of a supplemental soils investigation.

143) ***Page 10, Groundwater Alternative GW2*** - As reported by the National Academy of Science ("NAS") in the report titled Alternatives for Ground Water Cleanup (1994), the effectiveness of this technology (groundwater pump and treat) on contaminated aquifers seems quite limited. This has led to a widely held view that pump and treat technology should be rejected as a technique for groundwater remediation. EPA fails to recognize the limitations of groundwater

pump and treat, especially when the potential exposure to humans is already managed through alternative water supplies. EPA has also failed to address the particular inappropriateness of a traditional pump and treat approach in karst.

EPA Response: The National Academy of Science Report referenced concluded the following three points: that 1) the ability of conventional pump and treat systems to reach health based cleanup goals for contaminated groundwater is highly site specific; and 2) although restoring the total volume of contaminated groundwater to health based standards may not be feasible at many sites, properly designed pump and treat systems will provide important benefits, including containment of contamination, retraction of the plume of dissolved contaminants, and removal of some contaminant mass from the subsurface. These conclusions support the use of pump and treat as a viable method for containment of contaminated groundwater. In the FS, containment of impacted groundwater was identified as an important component to the alternatives GW2, GW3, and GW4 [FS section 5] and the benefits and limitations of the pump and treat technology were considered during their development [FS section 4]. The karstic nature of the aquifer was considered in the FS and, based on experience at similar sites, a properly designed pump and treat system for containment is considered suitable for this hydrogeological environment.

144) ***Page 14, under heading's Implementability: Soils*** - In this paragraph, EPA describes the implementability difficulties associated with three possible remedial alternatives for soils. The only item cited for SO2 is the need to design storm water controls. In contrast SO3 and SO4 have issues as to storm water control on a temporary basis, as well as the adequacy of soil fracturing to allow treatment. EPA concludes that SO3 is easier to implement than SO4, but overlooks the fact that SO2 is the easiest alternative of the three to effectively perform. While recognizing the fact that the soil remedy will have some level of impact on the present company operations, EPA does not consider the cost of those impacts in evaluating the cost of the selected remedy (Page 15, Item 7). Most importantly, EPA fails to consider that most of the soils it proposed to remediate are only assumed to be impacted.

EPA Response: See EPA's responses to comments 14 and 15 for a discussion of PPPI's recent sampling at ANC C. SO2 was not overlooked as the easiest to implement. EPA stated only that SO3 is easier to implement than SO4. Alternative SO3 was selected after consideration of all the balancing criteria evaluations. EPA does not believe there would be significant costs due to facility disruption during implementation of Alternative SO3. SVE systems have been installed within operating facilities at other sites with minimal disruption. A soils source remedy is not being selected in the present ROD but will be documented upon completion of the supplemental soils investigation.

145) ***Page 16, fourth full paragraph*** - EPA states that the preferred alternative would reduce risk within a reasonable time frame and at comparably less cost than other remedies. However, this statement does not recognize that studies (NAS, 1994) show that pump-and-treat systems may be unable to remove enough contamination to restore the ground water to drinking water standards, or that removal may require a very long time, in some cases centuries. The cited NAS report states

that, as the complexity of the site increases, the likelihood that the pump-and-treat system will meet drinking water standards decreases. EPA also recognizes that it may be impracticable to actively restore ground water. In development of the technical impracticability guidance, EPA has conducted studies, issued guidance, and prepared policy interpretations focusing on ground water remediation systems and site conditions (i.e., factors) that limit ground water restoration potential (i.e., the likelihood that remediation will achieve ARAR- or risk-based cleanup levels). As noted in the December 21, 1988, Federal Register (53 FR 51434), EPA described four site conditions that could inhibit ground water restoration: Aquifers with fractured bedrock or karst formations, consistent with the conditions at Pohatcong Valley Groundwater Contamination Site are one of the site conditions that could inhibit groundwater restoration cited by the Agency. Nevertheless, here EPA has concluded that a groundwater pump and treatment remedy would be effective in achieving the stated goals. In addition, EPA labels it more effective than monitored natural attenuation, based on the minimal difference of 4 years to achieve the identified remedial goal through this late alternative. (Table 5-2 of the FS).

EPA Response: Please refer to EPA response to comment 143 regarding the cited NAS 1994 report. Groundwater Alternative GW2 is the preferred remedial alternative for groundwater. This includes pumping and treatment of the most contaminated part of the TCE plume (concentrations exceeding 500 ppb) using a series of extraction wells along the downgradient edge of this source area. The hydrogeology of the Site is conducive to implementing effective treatment of the most contaminated part of the TCE plume. The remedy appropriately includes monitored natural attenuation to address the remaining lesser concentrated downgradient portion of the groundwater contaminant plume, where concentrations are several orders of magnitude lower than in the hot spot area. Natural attenuation with long term monitoring will be used in the downgradient parts of the TCE and PCE plumes to reduce contamination to below the remedial goals of 1 ppb each. Moreover, the hydrogeology at the site is conducive to reinjection of treated groundwater, as PPPI should be well aware, with the operation of its own long term reinjection well at the facility in question.

PPPI/Alcan Comments on the Transcript of August 4, 2005

Public Meeting on Proposed Plan

PPPI first received the transcript of the Proposed Plan public meeting on September 13, 2005. Therefore, its opportunity to comment on statements made to the public by the Agency was limited to a twelve day period. At the August 4th public meeting, representatives of the EPA reiterated many of the erroneous statements contained in the Proposed Plan and RI/FS commented upon above. Therefore, those comments are incorporated herein as pertinent to the public meeting as well.

EPA Response: EPA has complied with relevant CERCLA and NCP requirements by keeping a

transcript of the public meeting and making it available to the public. A representative of PPPI was present at the public meeting and did not raise any issues or comments about EPA's statements at the afore-mentioned meeting. EPA has responded to and clarified each issue raised by PPPI with respect to the RI/FS and Proposed Plan.

146) ***Page 11 of Transcript*** - Murray Rosenberg contractor for EPA, states that the highest TCE concentrations in the Pohatcong Valley were immediately downgradient and adjacent to the former ANC facility. That is incorrect. The concentration Mr. Rosenberg is referring to was detected in a sampling point on the Vikon Tile property. That property and the well where the highest detection of TCE was encountered are not "immediately" downgradient of the former ANC facility. The Norfolk Southern property and portions of the Warren Lumber Yard are located between the two properties. In addition, Vikon Tile is actually side gradient to the former ANC property based on EPA's own analysis.

Further, in light of the complex nature of the hydrogeology in the Pohatcong Valley and the lack of detailed hydrogeologic analysis by the EPA in its proposed source area, there is no basis to conclude that the Vikon Tile groundwater finding is linked to the former ANC property, or the groundwater beneath it. No concentration approaching the 2100 ppb found at Vikon Tile has been detected in groundwater at the former ANC property. The Vikon Tile property itself has a history of significant solvent usage and disposal, and is the most likely source of the noted groundwater impact. This history was not mentioned during the public meeting. In fact none of the likely alternative sources of TCE were discussed during this public meeting, leaving the public with the mistaken impression that the former ANC property is the only possible source.

EPA Response: The distance between the southern fence line of the ANC facility property and the Vikon Tile property is very small, only about 150 feet. Considering the OU1 Study Area included investigations over an approximate 5 mile portion of the Valley, in perspective, the statement is correct. In addition, groundwater in the regional aquifer generally flows to the southwest. The Vikon Tile facility can be considered to be located south and southwest of the ANC facility. See EPA's responses to comments 9, 20, 21, and 37.

This comment also states that the history of the Vikon Tile facility was not mentioned at the public meeting. EPA described the manner in which it organized the remedial investigations at this Site, including the fact that it originally considered 107 facilities as Potential Source Areas. All the information collected regarding these facilities is presented in the RI Report. For EPA to elaborate on the history at all of these facilities would have required an extensive amount of time. If any person attending the public meeting had wished to discuss the history of Vikon Tile or any other facility including in the RI, EPA would have obliged. The ANC facility was discussed during the public meeting because it was the only identified source of TCE at the Site after an extensive RI.

147) ***Page 12 of Transcript*** - Here again, Mr. Rosenberg refers to the finding of 2100 ppb in groundwater at the Vikon Tile property. He again terms that property "immediate downgradient." Assuming he is again referring to a location downgradient of the former ANC property, please see

our comment 145 above.

EPA Response: See EPA's responses to comment 146, above.

148) ***Page 15 of Transcript*** - EPA states that the highest soil concentration detected was 52 ppm in Area A. The samples where TCE was detected in Area A are not on the former ANC property. Nor is there any basis, as reviewed in our comments on the RI/FS, to conclude that the TCE found in soils in Area A is attributable to former ANC operations. (See Comments 20, 26, 31 and 42 above).

On this same page, EPA also notes the detection of 400 ppm in soils in the area of the former ANC property. EPA fails to mention that this TCE was detected in a shallow soil sample (1.4-1.9 feet below grade) and that extensive investigations of soil in the area showed no evidence of any TCE below a depth of 6.5 feet below grade. Further, other detections of TCE were significantly lower than 400 ppm. In addition, the Agency should note that the small area of contaminated soil, including the location of the sample where TCE was detected in this area, was remediated.

EPA Response: The RI findings provide EPA with a strong basis to conclude that TCE contamination in soils and groundwater are attributable to the former ANC facility. These findings are clearly presented in the RI Report and were summarized at the public meeting. For more detail with respect to the first part of this comment, see EPA's responses to comments 9, 20, 26, 31 and 42, above.

With respect to the second part of this comment, while elevated levels of soil contamination have been detected on and adjacent to the ANC property, EPA does not believe that TCE soil contamination on the property has been fully characterized. Since PPPI's submission of these comments, it has conducted sampling in the ANC C area and found elevated levels of TCE contamination above NJ IGWSCC in both shallow and deep soils. See EPA's responses to comments 14 and 15. Further delineation of soil contamination will be performed at the former ANC facility, and a soil source area ROD will be issued after these new data have been evaluated.

149) ***Page 19 of Transcript*** - EPA stated that the risks due to groundwater impacts are "considered to be site-wide because the plumes are more or less site-wide." That is both an oversimplification and a misuse of EPA's own risk assessment. The risks from groundwater impacts differ from place to place within the Pohatcong Valley due to both the provision of treated water and the varying concentrations of constituents found. To say that all 8.75 square miles of groundwater presents the same level of carcinogenic risk is simply inaccurate. This is especially true given the karstic nature of the geology in the Valley.

EPA Response: The statement is correct and not an oversimplification. The groundwater contamination detected within the OU1 Study Area is widespread and although the plume contains varying levels of TCE, the levels detected throughout the OU1 Study Area are significantly above risk based standards, and pose an unacceptable risk to human health. The aquifer at the site is

classified by the state of New Jersey as a drinking water aquifer and has been rendered unusable without treatment due to the contamination that is present. The fact that the water is treated prior to its use does not impact the results of the risk assessment. This is indicated in EPA's Risk Assessment Guidance for Superfund (RAGS), as well as on page 7 of the Proposed Plan. EPA did not state that all 8.75 square miles of groundwater presents the same level of risk, but rather that groundwater throughout the entire plume delineated in the OU1 Study Area of the Site (which is approximately 5 miles long and 1.5 miles wide), contains levels of TCE which pose an unacceptable risk.

150) ***Page 23 of Transcript*** - On this page, EPA identifies dual phase extraction as its preferred soil remedy. EPA has no basis for a determination that dual phase extraction is necessary or appropriate in these low permeability soils with the groundwater concentrations that have been identified.

EPA Response: As stated, a soils remedy is not being selected in the present ROD. However, the basis for outlining dual phase extraction in the PRAP as the preferred alternative to treat soils is presented in detail in the FS Report. Some, but not all soils throughout the identified source areas are considered low permeability soils. The FS outlined that soil mixing and fracturing of soils, as appropriate, would assist a DPE system in reaching remediation goals. EPA will review appropriate remedial alternatives prior to the selection of a subsequent soil remedy and ROD, based on additional investigation results.

151) **Page 26 of Transcript** - EPA refers to a 500 ppb line on a map shown at the public meeting. The implication here is that all the groundwater within that line has in excess of 500 ppb of TCE in it. That is not true. Some wells within this line have much lower TCE concentrations. In addition, EPA fails to note that the TCE concentrations in wells that have been sampled multiple times have varied considerably, suggesting that the concept of a constant 500-ppb isoconcentration line that was presented by the Agency is over-simplistic and based on a single snapshot of the aquifer taken in 2002.

On this same page, EPA states that the remedy would include three extraction wells along the downgradient edge of the source area near the former ANC facility. The location of the proposed extraction wells presented in the FS is actually well to the south of EPA's proposed source areas and is not properly characterized as being "along the downgradient edge of the source area." The three wells are located approximately 500 feet south of possible Source Area A, 1200 feet south of the hypothetical Source Area C and more than 600 feet south of the southern most part of the ANC facility. In the complex hydrogeology that exists in the Pohatcong Valley, the proposed placement of these extraction wells is guess-work at best.

EPA Response: The map presented at the meeting is one developed by EPA during the RI/FS process to show the findings of groundwater contamination on a figure. Isoconcentration maps are a typical way that EPA proceeds with data assessment as part of the FS process. The map is accurate in depicting contamination trends and in showing the status of the extensive groundwater

contamination present throughout the Pohatcong Valley. The high levels of TCE and PCE contamination in groundwater are not stagnant, however, the maps depict a clear pattern of contamination based on extensive sampling. This contamination will be persistent throughout the Valley for years to come. Implementation of the selected remedy will reduce the amount of time for aquifer restoration by extracting and treating the most contaminated portions of the groundwater plume.

In response to the second part of this comment, within the scope of the groundwater plume identified in the OU1 Study Area, which is approximately 5 miles long by 1.5 mile wide, the proposed locations of the three extractions wells are relatively close to the former ANC facility. When EPA described the proposed locations for extraction wells during the public meeting as being along the "downgradient edge of the source area," EPA was referring to the most elevated area of groundwater contamination (approximately 500 ppb of TCE and above) as the "source area," not the soil source areas located on and adjacent to the former ANC property.

152) ***Page 28-29 of Transcript*** - On these pages, EPA mischaracterizes the TCE findings at the former ANC property. TCE was found in only two of over twenty AOCs investigated on that property. In these two areas, the TCE was confined to soils less than 6.5 feet deep on the former ANC property. No TCE was found at a depth of 30 feet on the former ANC property. Later in the transcript, Mr. Cipot refers to TCE "throughout the American National Can." As noted, that is untrue. The vast majority of the former ANC property was found to be TCE-free. In fact, in the RI/FS, EPA acknowledged that it had not found sufficient TCE source on or near the former ANC property to explain the groundwater conditions at the Site. To now attempt to characterize the former ANC property as having extensive TCE soil impacts is contrary to the data and inconsistent with the intent of public participation under the NCP.

On these pages, EPA also mischaracterizes the ground water conditions beneath the former ANC property. As noted above, no perched ground water has been detected beneath the former ANC property. (See comment 10) The findings EPA alludes to here were from other properties and are not consistent with the subsurface of the ANC property as defined by actual borings. PPPI does agree that any perched water is localized as stated by EPA. Given that localized nature, it is clearly inappropriate to attribute perched water found on one property to another property. This is particularly true when the properties have different topographies and boring locations may be a hundred or more feet apart as is true for the area surrounding the former ANC property.

EPA Response: Statements made throughout this comment are incorrect. EPA has found elevated concentrations of TCE on the former ANC facility during the RI; and PPPI and ANC found TCE contaminated soils on the property both historically and earlier this year during investigations performed under NJDEP authority. See EPA's responses to comments 14 and 15 for complete details. EPA cannot locate a reference to perched water in PPPI's comment 10, however, EPA has addressed similar comments numerous times (see EPA's responses to comments 9, 15, 30, 33, 51, 52, 88, 117, 143 and 153).

With respect to the portion of this comment related to perched water within the general area, perched water was detected at the site at the following facilities: ANC, Vikon Tile Corporation, and Warren Lumber Yard. Data supporting the conclusion that perched water is present beneath the ANC site, in particular, is presented in the RI Report (see page 156). With respect to the impact on ANC's property, this question has been answered in EPA's previous responses to comments 33 and 127.

153) ***Page 30 of Transcript*** - Here EPA concludes that the former ANC property is "definitely the center of contamination." However, that conclusion is based on numerous inaccuracies. Soil data is overlooked and non-ANC soils are assumed to be on the former ANC property. Soil impacts identified as being on other properties are assumed to be residuals from the former ANC properties. Perched groundwater has been assumed to exist beneath the former ANC property despite borings which demonstrate its absence. Upgradient detections of TCE in the ground water are disregarded. Possible sources such as Vikon Tile, the Norfolk Southern property and past uses of AC1 itself are ignored. EPA has repeated the mistakes of its RI/FS and Proposed Plan and made the "data" fit its preferred scenario instead of selecting a preferred remedy to address the actual data.

EPA Response: See EPA's responses to comments: 2, 9, 12, 14, 15, 20, 22, 23, 24, 26, 30, 31, 32, 33, 37, 40, 42, 44, 70, 77, 88, 90, 127, 138, and 146. EPA collected extensive amounts of groundwater, surface water, sediment and soil data throughout the Pohatcong Valley OU1 Study Area to determine the nature and extent of contamination sufficient to support the selection of a remedy. The commenter's statement that EPA started out with a preferred cleanup scenario and then proceeded to try to make the data fit that scenario is incorrect and unfounded. The preferred alternative presented in EPA's Proposed Plan was not developed until after completion of data collection and was clearly based on data and information collected during the RI.

The statement made during the public meeting indicating that ANC is the center of contamination is based on data. All elevated levels of TCE in soils to date have been detected on or immediately adjacent to the ANC property. TCE was used in the past as part of ANC's operations. A large area of soil contamination containing up to 400 ppm TCE was identified along the railroad tracks at the southwest corner of the building known as AOC 7. Lower concentrations of TCE were found at several other locations at the facility, including at the outfall identified as AOC 17 where TCE was detected in the effluent. In addition, the highest concentrations of TCE detected in soil samples collected during the Remedial Investigation was found at AC1, immediately downgradient of the ANC property. See EPA's responses to comments 9 and 20 for a discussion of the connection between the ANC property and AC1. All of the foregoing support EPA's contention that this facility is a source of the TCE groundwater contamination. No soil data collected during the RI has been overlooked and soil findings are clearly presented both figuratively and in descriptions provided throughout the RI and FS Reports. As described in the RI report, it is apparent that elevated concentrations of TCE detected in subsurface soils at the ANC property are continuing to contribute to groundwater contamination in the PVGCS.

Perched water was detected at the site at the following facilities: ANC, Vikon Tile Corporation, Warren Lumber Yard, and Washington Borough Garage. Data supporting the conclusion that perched water is present beneath the ANC site, in particular, is presented in the RI Report (see page 156). Neither upgradient detections of TCE, nor other identified Potential Source Areas have been disregarded in the study or in EPA's decisions regarding the Site. All data collected is presented in the RI Report.

154) ***Page 30-31 of Transcript*** - On these pages, EPA also alludes to various drains at the former ANC facility, and then goes on to say that they have sampled a number of drains from the facility. First, there is no information showing that any drain at the former ANC property is or was a source of TCE to the groundwater or soils on adjacent properties. Sampling of AOCs relating to building drains under the ISRA program did not detect significant concentrations of TCE. (See also comment 70 above.)

As to EPA's statements on the drains (referred to elsewhere as AOCs 16 and 17), those are storm drains, not process drains. With respect to the TCE findings cited, the concentrations are significantly lower than those found in regional groundwater, indicating that these drains cannot be significant sources of contamination. Since the NJDEP does not include these areas as potential sources, it appears that the State Agency agrees that they are not source areas. (See comments 31, 42, 44 and 71 above.)

EPA Response: See EPA's responses to comments 31, 42, 44, 70, and 71 for EPA's position on the issues related to drains at the former ANC facility. Further sampling planned in and around current and former drains at the facility should resolve some of the commenter's concerns. As noted previously, an ISRA investigation is currently underway in some of these areas under state direction. See EPA's responses to comments 14 and 15 for a discussion on the results of PPPI's sampling in the ANC C area under the building and along drain lines that found TCE contamination above NJ IGWSCC in shallow and deep soils.

155) ***Page 32 of Transcript*** - EPA again states that the TCE plume is in a steady state. The information to make such a statement is not available. (See comments 46, 91 and 120.)

EPA Response: This comment has been responded to previously. See EPA's responses to comments 46, 77, 91, 93, and 120, above.

156) ***Page 41-42 of Transcript*** - EPA makes a comparison between two potential groundwater remedies that are estimated to require 47 and 55 years to achieve their remediation goals. In this comparison, EPA notes that the selected remedy, which requires 55 years, does not require a significantly greater period of time than a remedy that is estimated to require 47 years. EPA notes that the additional cost for a possible 7 years reduction in the time required to achieve their remediation goals would cost a disproportionate amount (about 26 million dollars rather than 8 million dollars for the proposed remedy). This equates to a cost of about 2.6 million dollars for every additional year that the remedial action goals have been achieved.

In this discussion, EPA does not mentioned that they summarily dismissed a natural attenuation remedy in the FS that the Agency estimated would require 59 years to achieve their remedial action goals. The use of the selected remedy that requires 55 years instead of the natural attenuation remedy that requires 59 years equates to a cost of about 2 million dollars for every additional year that the remedial action goals have been achieved (i.e., 4 additional years required to achieve the remedy at a cost of 8 million dollars). Since this analysis used the same model, assumptions and procedures that were used to calculate the time to remediate using other alternatives, it is unclear why the Agency used the data from this model to dismiss a natural attenuation remedy in the FS. The Agency's argument that the difference between 47 and 55 years is insignificant also supports the conclusion that the difference between 55 and 59 years is equally insignificant.

EPA Response: It should be noted that this comment was essentially addressed in EPA's response to comment 112. As explained at the public meeting, the time frame estimates developed for the cleanup of groundwater under different alternatives are not exact. They are rough estimates developed for comparison and costing purposes. EPA did not "summarily dismiss" natural attenuation to address groundwater contamination. In fact, natural attenuation is an important element of the preferred alternative, as presented in the Proposed Plan and FS Report. EPA believes that a remedy that actively reduces the contaminant toxicity, mobility, or volume (TMV) through pumping and treating the most contaminated portion of the aquifer, while addressing the lesser areas of contamination with natural attenuation, will remediate the aquifer faster than natural attenuation alone. Moreover, the FS scenarios were developed under the baseline assumption that the soil source areas have been remediated, which is not the case at this point; therefore, the time frames are not accurate and may be underestimated as well.

157) ***Page 45 of the Transcript*** - On this page EPA responds to a question from the public by saying that cost is not a factor in selecting a remedial option. Yet the NCP requires consideration of the cost-effectiveness of each remedial option as part of a complete FS. Therefore, either EPA gave the public incorrect information or the Agency violated the NCP requirements in selecting the remedy in the Proposed Plan.

EPA Response: This comment refers to a discussion of cleanup costs during the public meeting. To put the discussion in context, EPA was clarifying that cost is not the only factor used in selecting a remedy. Based on a comment received by a member of the public at the meeting, EPA was clarifying that remedies are not selected based on the amount of money that a potentially responsible party can or will make available for cleanup, just as cleanups are not negotiated with potentially responsible parties prior to their selection. It was made very clear during the public meeting that EPA takes costs into consideration as a criteria when selecting a remedy. EPA states this on page 21 of the transcript. Further, on page 41 of the transcript, EPA indicates that the high relative cost of GW4 compared to other alternatives was considered a drawback in the remedy selection process. On page 42 of the transcript, EPA yet again states that costs were considered in proposing a preferred alternative. On page 11 of the Proposed Plan, which was widely distributed to the public before the public meeting, the nine Superfund Evaluation Criteria, including cost, are listed.

158) ***Page 77-78 of Transcript*** - The estimates of the mass of TCE present in the aquifer and in the supposed source areas are highly speculative and based on technically unjustifiable extrapolations from very few data points (Areas A and B) and no data points (Area C). (See comments 33, 127 and 128)

EPA Response: A soil remedy is not being selected at this time. Supplemental investigation and delineation activities will be conducted to provide more detail as to the vertical and lateral extent of contamination. A soils remedy will be documented in a ROD upon completion of the supplemental soils investigation. See EPA's responses to comments 33, 127 and 128.

159) ***Page 95 of Transcript*** - On this page, a reference is made to tales of "dumping barrels of contaminants over the river"; we are uncertain as to what river is being referred to. We suspect that the reference is to purported dumping by various entities along the railroad property near Vikon Tile, AC1, the former ANC site, and Warren Lumber Yard. However, in response to this comment, EPA failed to note that repeated investigations have found no drum or barrel disposal at or around the former ANC property related to operations at that property. EPA should have taken this opportunity to reassure the public that drum disposal is not an issue at the former ANC property. In addition, EPA should have noted the possibility that dumping by unknown parties may have caused the TCE contamination seen on the railroad property and elsewhere.

EPA Response: The statement referred to in the comment, regarding "dumping of barrels of contaminants over the river" was made by a citizen attending the meeting. The comment was related to stories that the citizen had heard regarding improper past disposal activities at the ANC facility. Based on this, the citizen had concerns related to the health and safety of current and former workers at the former ANC facility. EPA appropriately referred him to OSHA to follow up with his concerns, as that is the Agency that addresses worker protection. Furthermore, there is historical evidence from aerial photographs of possibly stacked drums and other materials that had been stored and staged in the immediate area of the railroad spur and southwest part of the former ANC property. These aerial photographs support the claim that contaminants may have been dumped in the vicinity of the ANC property. The commenter's suggested responses for EPA are irrelevant to the question.

160) Throughout the public meeting transcript, a ground water model developed by USGS is referred to. This model was reportedly specifically developed for EPA's use at the Pohatcong Valley Site. However, the modeling done in the RI/FS and relied upon in the Proposed Plan used a completely different model that was woefully inadequate to address the acknowledged complexities of the aquifer. No explanation is provided as to why the USGS model that appears to be significantly more sophisticated than the model used by the Agency was not used despite the fact that statements made during the public meeting indicate it was available.

EPA Response: See EPA's responses to comments 5, 7, 8, and 10. The USGS-developed groundwater model referenced during the public meeting was not finished in time to apply the modeling required to support the feasibility study. A significant amount of time and effort is

required to calibrate the model and conduct the necessary sensitivity analysis. The USGS modeling effort will be continued and the results evaluated. Modeling done in the FS to assist in the evaluation of the developed alternatives is sufficient for the selection of an appropriate remedy. Additional modeling will be considered in the course of implementing the engineering design of the remedy. EPA weighed specific aspects of each model to determine which one was the most suitable for the Remedial Investigation Report.

161) The transcript of the public meeting also describes the EPA proposed pump and treat remedy for the groundwater. However, no mention is made of the karst-nature of the geology. EPA's own guidance documents view pump and treat as inappropriate in a karst setting. This essential point should have been noted to the public to facilitate their review of EPA's RI/FS and Proposed Plan.

EPA Response: The karst nature of the aquifer is mentioned in the Proposed Plan and in the RI and FS Reports, which are part of the public record. The public meeting is a forum during which the public can raise whatever concerns they have. EPA's presentation was a summary of the RI and FS findings and the Proposed Plan. EPA generally keeps the presentations at these meetings short to allow the maximum amount of time for any member of the public to raise all the questions and concerns they have. If anyone attending the public meeting wished to discuss the karst nature of the aquifer, EPA would have discussed it at the meeting. This item was not raised at the meeting. Based on extensive data collected related to the aquifer throughout the Site, EPA believes that an extraction and treatment remedy will be successful in addressing groundwater contamination. This remedy is consistent with EPA guidance, and the unsupported broad statement regarding the EPA's guidance for pump and treatment as inappropriate in karst settings is simply incorrect. See EPA's response to comment 143. There are numerous and more recent publications from a variety of engineering and scientific organizations which have documented the application of groundwater pump and treat technology as an effective technique for groundwater remediation, and it is appropriate for the specific hydrogeology associated with the site.

PPPI's Conclusion

For all of the reasons reviewed above, EPA's RI/FS and resultant draft Proposed Plan do not meet the applicable statutory standard of being "not inconsistent" with the NCP. EPA has acted arbitrarily and capriciously in issuing a draft Proposed Plan based on an RI which did not define the "nature and extent of the threat presented by the release." (See Washington State Dept. of Transportation v. Washington Natural Gas Company, PacifiCorp, 59 F3d 793 1995). It is well established that EPA's failure to adequately investigate a site prior to remedial selection is arbitrary and capricious. State of Minnesota v. Kalman Abrams Metal, Inc. 155 F3d 1019 (8th Cir. 1998) and W.R. Grace & Co. v. EPA, 261 F3d 330 (2001). In this instance, EPA has admitted its failure to find the TCE source and has therefore proposed a remedy for sources presumed to exist. Clearly such action by EPA is arbitrary and capricious.

40 CFR 300.430(d) states that the purpose of the RI is:

". . . to collect data necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives (emphasis added).

and

. . . shall characterize the nature of and threat posed by the hazardous substances and ... gather data necessary to assess the extent to which the release poses a threat . . ."(emphasis added)

The NCP goes on to say that the RI shall define:

(iii) The general characteristics of the waste, including quantities, state, concentration, toxicity, propensity to bioaccumulate, persistence and mobility.

(iv) The extent to which the source can be adequately identified characterized.

The emphasis here is on data collection, not speculation or calculations based on assumptions that ultimately result in admittedly hypothetical source areas with assumed sizes and assumed exposure pathways.

The NCP also requires an FS based on site-specific conditions well integrated with the RI. Here the FS is flawed because it is dependent on an inadequate RI. The draft Proposed Plan is in turn fatally flawed due to its reliance on both the deficient RI and the consequently incomplete FS. Selection of a proposed remedy based on unknown sources and oversimplified ground water concepts places EPA at risk of adopting a non-cost-effective remedy in contravention of the NCP. (See Lone Pine Steering Committee v. EPA, 600 F. Supp. 1487 (D.N.J.) aff'd 777 F.2d 882 (3d Cir. 1985). The underlying purpose of these regulatory and judicial requirements is the creation of a sufficient record to allow informed judicial review of Agency remedial decisions. In this instance, the RI/FS and Proposed Plan provide no such record.

The public meeting on the proposed plan repeated the issues prevalent in the RI/FS and Proposed Plan. During that meeting, EPA repeated many of the oversimplified and/or erroneous conclusions presented in its documents. The information provided to the public to justify the Proposed Plan influences the publics' responses and the adequacy of the public participation opportunity during the comment period. In this instance, public participation was virtually precluded by EPA's selective use of data, disregard of Site hydrogeology and failure to comply with NCP requirements in its oral statements and the RI/FS and Proposed Plan.

As we have consistently communicated to EPA, PPPI remains willing to discuss conditions at the former ANC property and address any legitimate remaining concerns in a technically appropriate manner. Our significant concerns with the RI/FS and Proposed Plan as expressed in the comment letter do not detract from PPPI's interest and willingness to resolve this matter in a cooperative manner if possible. We remain interested in speaking with EPA to explore resolution of this matter, preferably in advance of issuance of a ROD for the Pohatcong Valley Groundwater Site

OU1.

EPA Response: In compliance with the requirements set forth in CERCLA and the NCP, EPA as the lead governmental regulatory agency charged with the implementation of these laws and regulations has methodically investigated the soils and groundwater at the Site in order to: identify the existence and extent of the release; the source and nature of the hazardous substances, pollutants and contaminants; and the extent of the risks to public health and the environment in order to select the appropriate response actions. 42 U.S.C. 9604(b)(1). The processes that EPA used to investigate and delineate the characteristics and extent of the contamination as well as select the appropriate remedies to address the contamination have been fully documented in the Administrative Record for the Site. The Administrative Record and the Proposed Plan for the Site have been made available for public review and comment in full compliance with all applicable requirements.

EPA's investigation originally spanned a large geographic area. As the investigation progressed, the results of the soil and groundwater sampling clearly pointed to the source areas of the groundwater contamination, specifically the ANC/AC1 area for TCE and the LNL/MVS/TVN area for PCE. The PCE source areas appear to have degraded over time. This conclusion is supported by sampling results that show historically decreasing PCE concentrations in the groundwater plume. Sampling results have also tended to indicate the absence of PCE in the soils at source areas. However, the concentrations of TCE detected in Site groundwater have <u>not</u> been decreasing over time. Based on this data, EPA has determined that an ongoing uncontrolled source is responsible for the steady state of the TCE groundwater contamination.

PPPI mistakenly equates the fact that additional delineation of TCE source areas is required with a failure to identify the sources of TCE groundwater contamination. In fact, EPA's soils investigation has found TCE contamination above PRGs in soils sampled at or adjacent to the PPPI/Alcan facility (the former ANC facility). Moreover, in the past, PPPI's own investigations of its property under NJDEP oversight have found TCE-contaminated soils and groundwater at its facility. Recently, in early 2006, PPPI conducted soil sampling beneath the facility along piping lines and found TCE above NJ IGWSCC, thus confirming EPA's conclusion that a source of contamination exists at the area known as ANC C. EPA has identified the need for supplemental soils investigation and delineation at the PPPI plant at ANC C to quantify the volume of TCE contaminated soil that has to be remediated. Depending upon the results of the additional sampling, the volume of soil that will be treated may be adjusted upwards or downwards, however, the need to remediate currently identified source areas is expected to remain the same, only the ultimate amounts of materials requiring remediation are expected to change. The areas already identified as requiring remediation are based on actual field data and exceedances of cleanup standards, and the uncertainty of the volume of the TCE contaminated soil at the ANC A/AC1 and ANC B, or ANC C, will not impact the decision or need for remediation, as PPPI asserts, but merely the mass and aerial extent of contaminated soils that will need be remediated. The soil remedy will be documented in a ROD that will be issued after the completion of the supplemental soils investigation.

Bringing its scientific and technical expertise to bear, EPA has fully and appropriately characterized the nature and extent of the groundwater contamination at this Site during the RI so as to enable it to evaluate appropriate remedies in the FS. The remedial alternatives were evaluated individually and against each other using NCP criteria in order to select the preferred remedy. As required by the NCP, EPA examined the relevant data, based its decisions on materials contained in the record, and articulated in the Proposed Plan. As proposed, the remedy was selected and evaluated in a manner that is not inconsistent with the NCP and is protective of human health and the environment, cost-effective, meets ARARs and utilizes permanent solutions to the maximum extent practicable. Therefore, the remedy was not selected arbitrarily and capriciously but in a scientifically appropriate manner that was in compliance with CERCLA and NCP requirements, as well as in the cases cited by PPPI and Alcan. (*See also United States v. Hardage*, 982 F.2d 1436 (10th Cir. 1992); *United States v. Kramer*, 913 F. Supp. 848 (D.N.J. 1995)).

As discussed above and in the ROD, EPA has decided to conduct a supplemental soils investigation in and around the PPPI facility to verify the volume of TCE contaminated soils. Therefore a soil remedy is not being selected at this time but will be selected upon completion of the supplemental soils investigation. The current remedy will address groundwater, only, and upon issuance of the ROD, EPA is willing to meet with PPPI to discuss implementation of the selected groundwater remedy.

ATTACHMENT A

PROPOSED PLAN

Superfund Program
Proposed Plan

U.S. Environmental Protection Agency, Region II

Pohatcong Valley Groundwater Contamination Site
Operable Unit 1 Study Area
July 2005

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the Preferred Alternatives to address groundwater contaminated with trichloroethylene (TCE) and tetrachloroethylene (PCE), and TCE-contaminated soils, within the Pohatcong Valley Groundwater Contamination Superfund Site (PVGCSS) in Warren County, New Jersey, and provides the rationale for those preferences.

The U.S. Environmental Protection Agency (EPA) is addressing the cleanup of the site in two phases, called Operable Units. This Proposed Plan addresses Operable Unit 1 (OU1), which includes the cleanup of contaminated groundwater, and areas of soil contamination in Washington Borough. The extent of OU1 groundwater contamination is about 5 miles in length and less than 2 miles in width, and includes portions of Washington Borough, and Washington and Franklin Townships that lie along Route 57 in the Pohatcong Valley, southwestward to the town of Broadway. The OU1 Study Area contains both the contaminated groundwater and the soil source areas for the contaminants TCE and PCE, in excess of the New Jersey Groundwater Quality Standard (GWQS) cleanup goal of 1 part per billion, or 1 ppb. A Remedial Investigation (RI) for Operable Unit 2 (OU2) is currently in the planning phase for the southwest area of OU1, which includes an adjacent part of Franklin Township and Greenwich Township. The OU2 area is located hydraulically downgradient of OU1, along the direction of groundwater flow in the valley. Figure 1 identifies the location of the site and the OU1 Study Area.

This Proposed Plan includes summaries of all cleanup alternatives evaluated for use at this site. This document is issued by EPA, the lead activity for site activities, and the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA, in consultation with the NJDEP, will select a final remedy for contaminated soils and groundwater at the site after reviewing and considering all information submitted during a 30-day public comment period. EPA, in consultation with the NJDEP, may modify the Preferred Alternatives or select another response action presented in the Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan.

EPA is issuing this Proposed Plan as part of its community relations program under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or Superfund). This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation and Feasibility Study (RI/FS) reports and other documents contained in the Administrative Record for this site. EPA and the NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted at the site.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
July 27, 2005 – August 26, 2005
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: August 4, 2005
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at in the **Warren County Vocational Technical School located on Route 57, at the border of Washington and Franklin Townships,** New Jersey at 7 p.m.

For more information, see the Administrative Record at the following locations:

U.S. EPA Records Center, Region II
290 Broadway, 18th Floor.
New York, New York 10007-1866
(212) 637-4308
Hours: Monday-Friday - 9 am to 5 p.m., by appointment.

Warren County Health Department
315 West Washington Avenue
Washington Boro, New Jersey 07882
908-689-6693

SITE BACKGROUND

The PVGCSS OU1 Study Area encompasses approximately 8.75 square miles (5,600 acres) in Warren County, New Jersey, consisting of rural, industrial, commercial, municipal, and residential land located within the Pohatcong Valley. The Study Area includes portions of Washington Borough, Washington Township, and Franklin Township, in Warren County (see Figure 1). Pohatcong Valley is a northeast-southwest trending valley that is bounded by mountains, is part of the Delaware River watershed, and is drained by Pohatcong Creek and associated tributaries.

Soil

Alternative SO3 is the EPA's and NJDEP's preferred remedial alternative for contaminated TCE soils and includes Dual Phase Extraction (DPE) and limited shallow soils excavation for the TCE source areas. Alternative SO3 minimizes the leaching of contaminants into groundwater, prevents risks from direct contact to contaminated media, and limits erosion of contaminated soils by treating the contaminated soil.

Groundwater

Groundwater Alternative GW2 is the preferred remedial alternative for groundwater. This includes pumping and treatment of the most contaminated portion of the TCE and PCE plumes using a series of extraction wells along the downgradient edge of the source areas. Extracted water will be treated using air stripping (transferring TCE and PCE from liquid to vapor phase) prior to reinjection into the regional aquifer. Natural attenuation with long-term monitoring will be used in the downgradient parts of the TCE and PCE plumes to reduce contamination.

SITE HISTORY

Chlorinated volatile organic compounds (VOCs), specifically TCE and PCE, were detected in groundwater from two public potable-water supply wells in the late 1970s. The two potable-water supply wells are known as

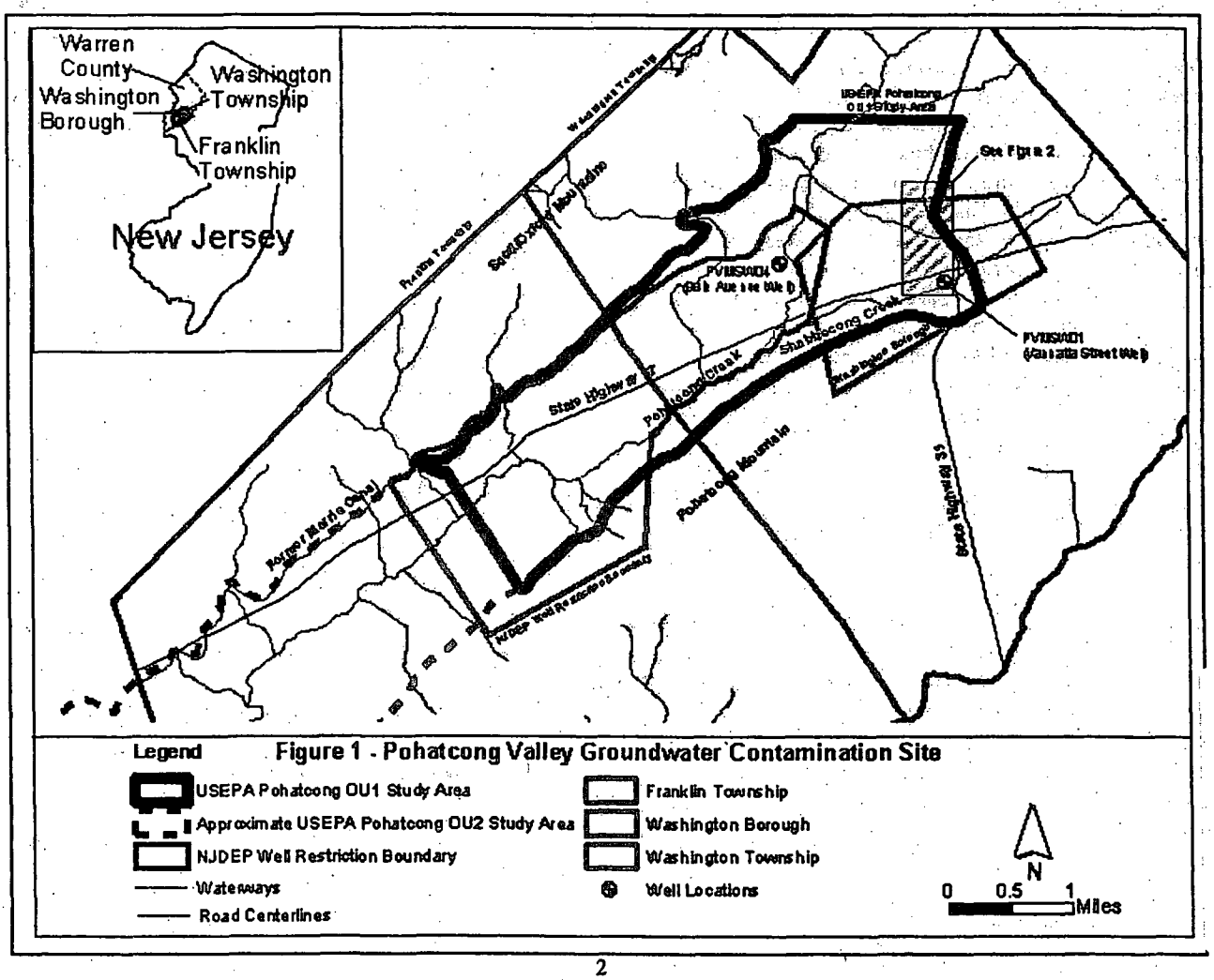

Figure 1 - Pohatcong Valley Groundwater Contamination Site

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the Vannatta Street well and the Dale Avenue well. TCE and PCE were detected in groundwater samples collected from the Vannatta Street well in July 1978 at concentrations of 1.7 ppb and 8.3 ppb, respectively. At the Dale Avenue well, only TCE was detected in groundwater samples collected in early 1979, at concentrations between 44 ppb and 160 ppb.

After subsequent investigations conducted by the Warren County Department of Health and the NJDEP, the NJDEP installed public water supply connections to the homes and businesses within the contaminated area of in 1989. EPA included the Pohatcong Valley Site on the National Priorities List (NPL) in March 1989.

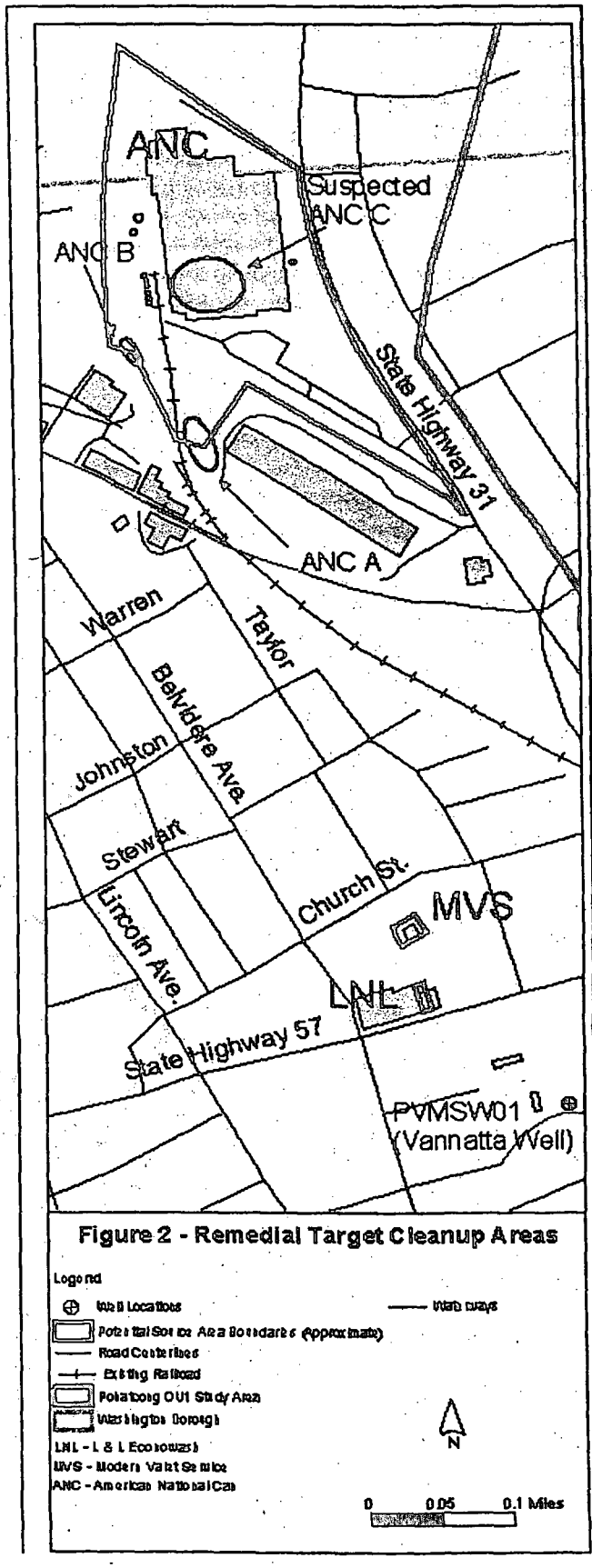
EPA initiated Preliminary Remedial Investigation (RI) work in the early 1990s, which included reviewing site background information from the Warren County Department of Health and the NJDEP, and developing an initial list of 107 Potential Source Area (PSA) facilities to be evaluated as possible sources of chlorinated VOCs and other contaminants. EPA issued over 100 information request letters to facilities, and conducted site visits.

In 1999, EPA funded a new contract and brought on a new contractor to perform the full range of OU1 RI/FS activities, including the delineation of the nature and extent of contaminated groundwater, and evaluation of the potential human health and ecological risks based on the occurrence and distribution of site-related contaminants detected in the OU1 Study Area. Of the 107 original PSAs identified, EPA selected 37 PSAs and investigated them in three separate phases identified as Phases 1A, 1B, and 2. The investigation was designed to determine if any PSAs were contributing to the regional chlorinated VOC groundwater contamination within the OU1 Study Area. In addition, as the RI progressed, 8 new PSAs were identified and added to the field investigations, for a total of 45 PSAs investigated. After Phases 1A and 1B, 16 PSA facilities were retained and evaluated as part of Phase 2 comprehensive field work.

Based on the results of Phase 2 RI work in 2004, three PSA facilities were issued general notice letters informing them that they were Potentially Responsible Parties (PRPs) for the site contamination. Within the RI, the FS, and this Proposed Plan, these parties are designated as American National Can (ANC), L&L Econowash Cleaners (LNL), and Modern Valet Services (MVS). The locations of these facilities are shown on Figure 2.

SITE CHARACTERISTICS

The site encompasses a broad range of demographics. The northern portion of the OU1 Study Area is within the



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commercial, industrial and residential portion of Washington Borough. The southern part of the OU1 Study Area is generally rural, with intermittent residences and housing developments. The valley is surrounded by heavily wooded areas and two parallel opposing topographic ridges. The site lies within the elongated valley between the ridges. The geology of the Pohatcong Valley consists of unconsolidated sedimentary deposits of glacial origin overlaying weathered bedrock. The unconsolidated sediments vary in thickness, but are generally between 50 and 100 feet thick within the OU1 Study Area, with the deeper portion in the Washington Borough area. The primary drinking water aquifer underlying the site is the competent bedrock, and is generally composed of fractured and karstic limestone and dolomite.

Groundwater in the Pohatcong Valley is found in perched aquifers within the unconsolidated deposits and in the deeper regional aquifer in the deep overburden and bedrock. Perched aquifers do exist in areas, however they are not considered to represent a significant source of groundwater for the region and are not considered significant conduits for the migration of contaminated groundwater. Groundwater in the regional aquifer is generally encountered at a depth of approximately 100 feet below ground surface (bgs) in the northern part of the OU1 Study Area, and at a depth of approximately 40 feet bgs in the downgradient, southernmost portion of the OU1 Study Area. Groundwater in the regional aquifer generally flows to the southwest, along the length of the Pohatcong Valley.

The groundwater in Pohatcong Valley is used as a source of potable drinking water, for industrial cooling and process water, and for irrigation purposes. New Jersey American Water Company (NJAWC) owns and operates the Dale Avenue and Vannatta Street public supply wells in which TCE and PCE were originally detected. As per state law, groundwater extracted by these wells is treated to meet all NJ drinking water standards. About 65 and 124 million gallons of water are produced annually by the Dale and Vannatta wells, respectively. The residences within the impacted portion of the OU1 Study Area were connected to the public-water supply pipeline by the NJDEP in 1989, and were required to abandon their residential wells, but several residential wells are currently believed to have remained open and may be in use, even though the residences are connected to a public water supply.

As part of EPA's comprehensive RI investigation, 107 PSA facilities were screened, and a total of 45 underwent intrusive field work. As part of the RI, a total of 45 monitoring wells were installed; 59 temporary wells were installed; 35 domestic wells were sampled; 286 groundwater samples were collected; 152 soil borings were completed; 399 soil samples were collected; 21 sediment samples were collected; 43 surface water samples were collected; over four miles of seismic survey and 2 miles of borehole geophysics were conducted; 320,000 gallons of waste water were treated on-site; and 550 drums of investigation derived wastes were disposed of off-site.

Soil Contamination

The highest concentrations of TCE detected in soil were found at American National Can (ANC), and an area immediately adjacent to ANC, known as AC1. These PSAs were identified as potentially significant source areas based on a comparison of the TCE soil concentrations to the New Jersey Impact to Groundwater Soil Cleanup Criteria (IGWSCC) of 1 part per million (ppm). The areas of contamination requiring soils cleanup, referred to as areas "ANC A" and "ANC B", contained maximum concentrations of 52 ppm and 3 ppm of TCE, respectively. The estimated surficial aerial extent of ANC A is approximately 28,000 square feet, and for ANC B, approximately 2,000 square feet. ANC B exhibits impacts at shallow depths (less than 5 feet), while it has been assumed based on soil sample data that ANC A contains contamination in the unconsolidated zone to a depth of bedrock at 100 feet. These estimations are based on limited sampling; the exact extent of soil contamination at the source areas will be delineated during the Remedial Design phase of the project.

It should be noted that a greater amount of TCE contamination has been detected in groundwater than could be accounted for entirely from the two ANC soil source areas identified. Based on best professional judgment and historic information, additional contamination is believed to exist in soils in the vicinity of the ANC building. Thus; a third suspected source area called "ANC C" has been included as part of the Feasibility Study (FS) and is included in the evaluation of alternatives. For the purpose of the evaluation of alternatives, ANC C is estimated to be located adjacent to the existing ANC potential source areas identified during the RI, in the vicinity of the southwest corner of the present ANC manufacturing building. Previous studies and remediation activities conducted by ANC under oversight of the NJDEP have detected TCE concentrations of up to 400 ppm in shallow soils in this area. Moreover, no studies to date have been conducted underneath the large, active manufacturing facility. The source areas will undergo further delineation in the remedial design to accurately determine the amount of contaminated material that needs to be remediated.

500217

The highest concentrations of PCE in soil were detected at the L&L Dry Cleaners (LNL), Modern Valet Service (MVS), and Tung Sol Tubing/Pohatcong Hosiery (TVN). Although PCE was detected at these locations in shallow soils, all soil concentrations were lower than the New Jersey IGWSCC of 1 ppm, and therefore will not require remedial action. The RI determined that PCE is not present in the soils at significant concentrations. The total mass of PCE in soil at each of the three PCE PSAs is approximately 0.5 pounds. Based on these results, soils are no longer a significant source of PCE groundwater contamination.

Groundwater Contamination

Groundwater samples collected throughout the OU1 Study Area indicate that TCE and PCE have migrated down through unconsolidated soils into the regional aquifer, contributing to two separate plumes. The TCE plume has migrated in the regional aquifer several miles downgradient from its original sources, whereas, the PCE plume has remained primarily within Washington Borough. TCE is by far the main groundwater contaminant within the OU1 Study Area. The highest TCE concentrations detected during the RI in groundwater, up to 2,100 ppb, are located immediately downgradient of the ANC PSA facility. The lateral extent of the TCE plume appears to be confined to near the center of the Pohatcong Valley.

The highest PCE concentration detected in groundwater during the RI was 54 ppb at the Vannatta Street public supply well, near the LNL Econowash Dry Cleaners and Modern Valet Service facilities. The extent of the PCE plume is much smaller than the TCE plume and is localized in the Borough of Washington.

SCOPE AND ROLE OF THE ACTION

For the purposes of planning response actions, EPA has addressed the cleanup of the site in two discrete phases, or Operable Units (OUs). Operable Unit 1 (OU1), which is the subject of this Proposed Plan, will provide for implementation of a remedy to address the TCE-contaminated soils contributing to the TCE groundwater contaminant plume, as well as a remedy to address both TCE- and PCE-contaminated groundwater within the OU1 Study Area.

The investigation of OU2 within the southwestern portion of the Pohatcong Valley will be initiated later in 2005 to determine the nature and extent of contaminated groundwater in the OU2 Study Area, and to select an appropriate remedy for the OU2 Study Area.

"What is a Principal Threat"?

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)). The "principal threat concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contaminants to groundwater, surface water or air, or acts as a source of direct exposure. Contaminated groundwater generally is not considered to be a source material; however, contaminant hot spot areas in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy for soils and groundwater employs treatment as the principal element. In addition, NJDEP has recommended that soils contaminated with VOCs in excess of 1 ppm may also be a source of groundwater contamination, so soils in excess of that criterion are also considered principal threat waste.

SUMMARY OF SITE RISKS

Human Health Risks

Screening-level risk evaluations were performed for the 45 Potential Source Areas (PSAs), and the 80 groundwater monitoring and water supply wells investigated during the OU1 RI. Based on the screening-level risk evaluations, EPA identified 8 PSAs, 3 wells, and the TCE and PCE groundwater plumes to undergo a full baseline human health risk assessment (HHRA).

The HHRA was conducted to evaluate the potential human health risks associated with exposure to the chlorinated VOCs, and other constituents such as metals, semi-volatile organic compounds (SVOCs), non-chlorinated VOCs detected during the RI.

The HHRA characterized the current and potential future human health risks based on the conservative assumption that no remediation would be implemented and the chemical concentrations would not decrease over time. Health risks are based on a conservative estimate of the potential carcinogenic (cancer-causing) risk or the potential to cause other health effects not related to cancer (noncarcinogenic risk). A Hazard Quotient (HQ) is calculated for each noncarcinogenic chemical contaminant of potential concern (COPC), and the total noncarcinogenic risk is calculated as the sum of all HQs,

500218

called a Hazard Index (HI). Likewise, the total carcinogenic risk is calculated as the sum of the carcinogenic risks from each individual carcinogenic COPC.

Regarding the risks for exposure to TCE and PCE in the regional groundwater aquifer, and for TCE if consumed in domestic residential wells, risks or hazards are above EPA acceptable risk levels.

Groundwater exposure pathways in the regional aquifer include the operation of residential, industrial, or commercial production wells. Risks associated with groundwater were evaluated for use as potable water, for limited irrigation, and for other domestic uses. The risks evaluated from the TCE and PCE contaminated groundwater plumes are associated with ingestion, dermal contact, and inhalation of vapors while showering. Use of groundwater from domestic wells within the OU1 Study Area as a potable-water supply would result in non-carcinogenic hazards and carcinogenic risks above the EPA's target risk levels due to the presence of TCE. While EPA calculated these risks, it should be noted that the use of residential wells as potable water sources in the OU1 Study Area has been reduced or eliminated through implementation of the NJDEP Well Restriction Area and provision of public potable water supply. Groundwater is presently being supplied to commercial and residential users through the operation of public water supply wells by New Jersey American Water Company. Because groundwater pumped at the Dale Avenue and Vannatta Street water supply wells is treated before entry into the distribution system, TCE and PCE contaminants above risk levels do not reach consumers through use of the public water supply.

Regarding the risks for exposure at the targeted remedial soils cleanup areas, risks or hazards for both residential and industrial worker scenarios are above EPA acceptable risk levels for soils contaminated with TCE, some metals, and polycyclic aromatic hydrocarbons (PAHs). The hazards and risks associated with these areas are primarily from inhalation of TCE vapors, and metals within the dust that could be released from the contaminated soils. TCE detected in the surface and subsurface soil within the targeted remedial cleanup areas may pose carcinogenic risks and/or non-carcinogenic hazards above EPA acceptable risk levels to child residents, lifetime residents, industrial workers, and construction workers. The primary human exposure pathways for TCE in soil are direct contact with soils, or inhalation of vapors from the unsaturated zone soils. These vapors can migrate to the surface where they are released into the atmosphere or into subsurface structures (e.g., basements or excavations).

Exposure to very high concentrations of PCE can cause dizziness, headaches, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Irritation may result from repeated or extended skin contact with it. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations. In industry, most workers are exposed to levels lower than those causing obvious nervous system effects. The health effects of breathing in air or drinking water with low levels of PCE are not known.

Results of animal studies, conducted with amounts much higher than those detected at the site, show that PCE can cause liver and kidney damage. PCE has been shown to cause liver tumors in mice and kidney tumors in male rats. Exposure to very high levels of PCE can be toxic to the unborn pups of pregnant rats and mice. Changes in behavior were observed in the offspring of rats that breathed high levels of the chemical while they were pregnant.

Breathing small amounts of TCE may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating. Breathing large amounts of TCE may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage.

Drinking water with large amounts of TCE (greater than what has been detected at the site) may cause nausea, liver damage, unconsciousness, impaired heart function, or death. Drinking small amounts of TCE for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear. Skin contact with TCE for short periods may cause skin rashes.

Some studies with mice and rats have suggested that high levels of TCE may cause liver, kidney, or lung cancer. Some studies of people exposed over long periods to high levels of TCE in drinking water or in workplace air have found evidence of increased cancer. Although there are some ongoing questions about the accuracy of the studies of people who were exposed to TCE, some of the effects found in people were similar to effects in animals.

Ecological Risks

An Ecological Risk Assessment (ERA) was also conducted to evaluate risks to the environment associated with chlorinated VOCs detected in soil and groundwater. The ERA evaluated the occurrence of ecologically

important terrestrial habitat and surface water and wetland resources using direct site observations; the assessment of potential pathways between contamination and the habitats; the identification of ecological screening values; and the estimation of exposure concentrations based on site data. Following the estimation of exposure concentrations, the exposure concentrations were compared with the corresponding screening values to derive risk estimates.

The ERA concluded that complete exposure pathways exist for terrestrial plants/soil invertebrates, benthic macroinvertebrates and aquatic life within the OU1 Study Area. There is the potential for adverse effects to terrestrial plants/soil invertebrates from the presence of TCE in source soils, but the limited frequency and wide variance of exceedances suggest a localized area of potential adverse affect. Therefore, there is a limited overall potential for chlorinated VOCs to adversely affect the terrestrial plant/soil invertebrate community.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) were developed for contaminated soil and groundwater that are goals for protecting human health and the environment within the OU1 Study Area. These RAOs are used to develop the overall remediation goals to define the extent of cleanup necessary to protect human health and the environment. For purposes of the FS, it was estimated that approximately 163,000 cubic yards of contaminated soils would have to be treated to achieve RAOs.

Soil Remedial Action Objectives

- Prevention of human exposure, through contact, ingestion, or inhalation to contaminated soil that presents an unacceptable risk to human health.
- Prevention of erosion and off-site transport of soils contaminated at concentrations posing unacceptable risk.
- Remediation of contaminated soils, as necessary, to prevent further leaching of contaminants to groundwater.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

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

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

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

Risk Characterization: This step summarizes and combines exposure information and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk). For non-cancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a non-cancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which non-cancer health effects are not expected to occur.

Groundwater Remedial Action Objectives

- Overall restoration of the aquifer to drinking water quality within a reasonable timeframe.
- Remediation of the most contaminated areas of groundwater.
- Minimize further migration of contaminants in groundwater and the persistence of the downgradient plume.
- Prevent the ingestion of contaminated groundwater which may pose an unacceptable risk to existing and potential groundwater users within the OU1 Study Area.

To achieve these RAOs, cleanup goals for both soil and groundwater within the OU1 Study Area were identified. The remedial goal for soil is the New Jersey Impact to Groundwater Soil Cleanup Criteria (IGWSCC) of 1 ppm for both TCE and PCE. The remedial goal for groundwater is the New Jersey Groundwater Quality Standard (GWQS) of 1 ppb for both TCE and PCE.

INITIAL SCREENING OF ALTERNATIVES

In accordance with the Superfund program, a preliminary screening evaluation of the soil and groundwater remedial alternatives was completed to assess whether alternatives could be screened out prior to a detailed evaluation. The alternatives that were screened out were removed from consideration and not evaluated as part of the detailed analysis of alternatives. For example, some of the types of technologies that have been evaluated and screened out for soils remediation include several types of physical/chemical reduction, physical stabilization, soils vitrification, physical/chemical oxidation, soil washing, thermal steam stripping, incineration, low temperature desorption, and landfilling. Some of the technologies that have been evaluated and screened out for groundwater remediation include in-situ oxidation, in-situ reduction, steam injection, steam stripping, ion exchange, reverse osmosis, both permeable and impermeable barrier treatments, and various biological treatments. Additional details on the rationale for screening out technologies are mentioned in the FS.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that if a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining above levels that do not allow for unlimited use and unrestricted exposure, EPA must review the action no less often than every five years after the initiation of the action. Institutional controls (deed restrictions for contaminated soil, and a Well Restriction Area already in place for groundwater) are included for alternatives to limit the use of portions of the property during the remedial actions. The remedial alternatives for contaminated soil and groundwater within the OU1 Study Area are summarized below. Four remedial alternatives were developed for soil, and four remedial alternatives were developed for groundwater. The alternatives will address the extent of TCE contamination above the New Jersey remediation goal of 1 ppm for soils, and for TCE and PCE above the cleanup goal of 1 ppb for groundwater. These alternatives are selected from the alternatives that were evaluated in detail in the Feasibility Study for this site. It should be noted that soils alternatives were developed only to address TCE contamination, as no detections of PCE were found above the remedial goal of 1 ppm.

For the three active groundwater pump and treatment alternatives, GW2, GW3 and GW4, if, during implementation, any residences or businesses within the aerial extent of the OU1 plume are found to have not yet been connected to public water, EPA would offer to connect them, and seal their wells. Industrial and irrigation water wells in the area would also be evaluated, and a determination will be made regarding their continued use, including the possibility of either closure or treatment prior to use.

Regarding the targeted TCE soils areas, remedial alternatives have been developed which evaluate the areas referred to as ANC A, ANC B, and ANC C (see Figure 2). During the RI, two areas of TCE soil contamination above the remediation goal of 1 ppm were identified that will require remedial action to remove TCE that may be a continuing source of groundwater contamination. A third source area known as ANC C has been included and is presumed to exist because the currently-identified source areas are not believed to contain enough contaminant mass to account for the persistence of the high levels of locally-identified hot spot groundwater contamination. For the purpose of this evaluation, ANC C has been included in this remedy and is believed to be located in the vicinity of the southwest corner of the existing manufacturing building, and may include areas underneath the building as well. This is because previous studies and remediation activities conducted by ANC had detected TCE at concentrations of up to 400 ppm in shallow soils in this area, and because the area is adjacent to existing ANC potential source areas identified during the RI, and because no previous investigations have focused on the large area under the facility.

It should be noted that the source areas will undergo

further delineation in the remedial design to more accurately determine the amount and depths of contaminated material, and to define specific locations that need to be remediated.

Consistent with expectations set out in the Superfund regulations, with the exception of the No Action alternative, none of the alternatives presented rely exclusively on institutional controls to achieve protectiveness. The time frames presented for construction do not include the time for pre-design investigations, remedial design, or contract procurements. The environmental restoration time frames provided are only approximate, and were used to generate estimated present worth costs.

SOIL ALTERNATIVES

Soil Alternative SO1: No Action

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $0
Estimated Construction Time frame: None
Estimated Time of Environmental Restoration: 50 years

Regulations governing the Superfund program generally require that the "no action" alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action to address contaminated soils within the OU1 Study Area to prevent human exposure or continuing impacts to groundwater. Because contaminated soil would be left in place under this alternative, a review of the remedy every five years would be required.

Soil Alternative SO2: Capping and Institutional Controls

Estimated Capital Cost: $1,100,000
Estimated Annual O&M Cost: $4,900
Estimated Present Worth Cost: $1,240,000
Estimated Construction Time frame: 6 Months
Estimated Time of Environmental Restoration: 50 years

Soil Alternative SO2 includes the installation of an impermeable multi-layer cap at ANC A, the use of the existing concrete cap at ANC C, and the excavation and off-site disposal of soils at ANC B. Capping prevents risks from direct contact to contaminated media, limits erosion of contaminated soils, and minimizes leaching of TCE to groundwater. ANC C is already capped by the concrete foundation of the existing building. Because of the limited extent of contamination at ANC B, soil in this area would be excavated and disposed off-site. Limited excavation may also be conducted at ANC A or elsewhere, depending on the results of the pre-design investigations. Excavations would be backfilled with certified clean fill material. Because contaminated soil would be left in place under this alternative, deed restrictions and a review of the remedy every five years would be required.

Soil Alternative SO3: Dual-Phase Extraction and Shallow Soil Mixing

Estimated Capital Cost: $3,700,000
Estimated Annual O&M Cost (2 years):* $160,000
Estimated Present Worth Cost: $4,400,000
Estimated Construction Time frame: 3 Months
**Estimated Time of Environmental Restoration: 2 years*

Soil Alternative SO3 includes Dual Phase Extraction (DPE) for ANC A and C to meet the soil remedial objectives through active treatment. DPE involves the extraction of groundwater and air from the soil under a vacuum to create a negative pressure induced flow, with subsequent treatment to remove contaminants. Prior to installation of the DPE system at ANC A, soils to a depth of approximately 20 feet would be mixed to homogenize the soil and increase air permeability. Mixing methods would be decided upon in the remedial design phase and may include the use of rotating augers or standard exactor buckets working the soil until adequately homogenized. Pneumatic fracturing may be performed at deeper depths to increase air permeability and TCE removal effectiveness. Soil at ANC C would not be mixed because of the technical difficulties associated with assessing the soils the existing building. Because of the limited extent of contamination at ANC B, soil would be excavated and disposed of off-site. In addition, limited excavation may be conducted at ANC A, depending on the results of the pre-design investigations and conditions encountered during mixing. The excavations would be backfilled with certified clean fill material. Soil sampling would be conducted to verify the effectiveness of the remedy.

This alternative minimizes leaching of contaminants to groundwater, prevents risks from direct contact to contaminated media, and limits erosion of contaminated soils by treating subsurface soils to below the remedial goal of 1 ppm. This alternative will eliminate the need for long-term monitoring or institutional controls after treatment and will allow unlimited exposure and unrestricted use.

Soil Alternative SO4: Excavation and Off-Site Disposal

Estimated Capital Cost: *$10,000,000*
Estimated Present Worth Cost: *$10,400,000*
Estimated Construction Time frame: *8 Months*
Estimated Time of Environmental Restoration: 2 years

Soil Alternative SO4 includes the removal of shallow soils from ANC A and ANC B with TCE concentrations greater than the remediation goals for disposal off-site. Excavated soils would be replaced with clean fill material. Excavated soils would be treated, if necessary, in order to meet the requirements of the landfill that is to receive the waste. Soils remaining below the excavation depth (i.e., soils more than 20 feet bgs) would be treated by a DPE system similar to that described in Soil Alternative SO3. Excavation is limited to approximately 20 feet bgs as deeper depths would require extensive structural stabilization during an excavation. Soil sampling would be conducted to verify the effectiveness of the remedy.

This alternative minimizes leaching of contaminants to groundwater, prevents risks from direct contact to contaminated media, and limits erosion of contaminated soils by treating contaminated subsurface soils contamination to below the remedial goal of 1 ppm. This alternative will eliminate the need for long-term monitoring or institutional controls after treatment and will allow unlimited and unrestricted use.

GROUNDWATER ALTERNATIVES

Groundwater Alternative GW1: No Action

Estimated Capital Cost: *$0*
Estimated Annual O&M Cost: *$0*
Estimated Present Worth Cost: *$0*
Estimated Construction Time frame: *None*
Estimated Time of Environmental Restoration: greater than 60 years

As with the soils alternatives, regulations governing the Superfund program generally require that the "no action" alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action to address contaminated groundwater within the OU1 Study Area to prevent human exposure. Review of the remedy every five years would also be required.

Groundwater Alternative GW2: Source Treatment and Natural Attenuation

Estimated Capital Cost: *$2,552,000*
Estimated Annual O&M Cost: *$606,000*
Estimated Present Worth Cost: *$8,060,000*
Estimated Construction Time frame: *1 Year*
Estimated Time of Environmental Restoration: 55 years

The objective of Groundwater Alternative GW2 is to extract and treat the most contaminated part of the TCE plume (concentrations that exceed 500 ppb) using a series of extraction wells along the downgradient edge of this source area. The TCE treatment system would consist of three high yield extraction wells, each pumping at approximately 140 gallons per minute (gpm). The PCE system would consist of one extraction well, placed within the PCE source areas, pumping at approximately 100 gpm. Total generated groundwater for both systems would be approximately 520 gpm, for a total of approximately 749,000 gallons per day (gpd). Extracted groundwater would be treated using air stripping (transferring TCE and PCE from liquid to vapor phase, with off-gas treatment) prior to reinjection into the regional aquifer. Natural attenuation with long-term monitoring will be used in the downgradient parts of the TCE and PCE plumes to reduce contamination to below the remedial goals of 1 ppb.

This alternative will actively reduce the concentrations of TCE and PCE in groundwater in the area having the highest contamination. Further, potential residential groundwater users that are not connected to the public water supply will be given the opportunity to be connected.

Similar to Alternative GW1, institutional controls would be required to prevent the installation of wells in the contaminated groundwater plume, at least while the remedy is being implemented, and a review of the remedy every five years would also be required.

Groundwater Alternative GW3: Expanded Source Treatment and Natural Attenuation

Estimated Capital Cost: *$3,399,000*
Estimated Annual O&M Cost: *$996,000*
Estimated Present Worth Cost: *$25,760,000*
Estimated Construction Time frame: *1.5 Years*
Estimated Time of Environmental Restoration: 47 years

This alternative is similar to and modifies the Groundwater Alternative GW2 by installing additional extraction wells and increasing the pumping rate to capture a larger area of groundwater that exceeds 100 ppb of TCE. The TCE treatment system would include five high yield extraction wells, each pumping at approximately 280 gpm. The PCE system would consist of two extraction wells placed within the PCE source areas. Total generated groundwater for both systems would be approximately 1,610 gpm, for a total of

approximately 2,318,400 gallons per day. Extracted water would be treated in the same manner as Groundwater Alternative GW2 via air stripping, prior to reinjection into the regional aquifer, and natural attenuation with long-term monitoring will be used in the downgradient portions of the TCE and PCE plumes to reduce contamination to below the remedial goals of 1 ppb for each of these contaminants. This alternative meets the remedial objectives by extracting and treating the areas of areas of groundwater contamination containing the highest concentrations of TCE and PCE. Institutional controls would be required to prevent the installation of wells in the contaminated groundwater plume, at least while the remedy is being implemented, and a review of the remedy every five years would also be required.

Groundwater Alternative GW4: Entire Plume Capture and Treatment

Estimated Capital Cost:	*$10,811,000*
Estimated Annual O&M Cost:	*$2,373,000*
Estimated Present Worth Cost:	*$46,840,000*
Estimated Construction Time frame:	*3 Years*
Estimated Time of Environmental Restoration:	*22 years*

Groundwater Alternative GW4 meets the groundwater cleanup standards through the capture and treatment of the entire groundwater plume that exceeds a concentration of 1 ppb of both TCE and PCE, within the OU1 Study Area. This alternative protects human health and the environment within the OU1 Study Area and downgradient of the plume by removing the greatest amount of contaminated groundwater from the regional aquifer, as this alternative includes entire plume capture and treatment. It would require six sets of five extraction wells (30 wells total) oriented perpendicular to the migration of the plume, with each set spaced approximately 4,000 feet along the longitudinal extent of the OU1 plume. To completely capture the TCE plume, an estimated minimum of 1,500 gpm would need to be pumped at each set of extraction wells. This extraction system would produce a total of 9,000 gpm, for nearly 13 million gallons per day. The groundwater treatment system is assumed to be similar in process to that presented for Groundwater Alternatives GW2 and GW3, although significantly larger in scale to allow for treatment of higher volumes of groundwater (e.g., approximately six treatment plants may be needed to treat the amount of water extracted under this alternative). Under this alternative, groundwater remediation goals would be met in approximately 22 years.

The alternative meets remedial action objectives by extracting and treating the entire groundwater contaminant plume containing TCE and PCE.

Similar to Alternatives GW1, GW2, and GW3, institutional controls would be required to prevent the installation of wells in the contaminated groundwater, while the remedy is being implemented, and a review of the remedy every five years would also be required.

THE NINE SUPERFUND EVALUATION CRITERIA

1. **Overall Protectiveness of Human Health and the Environment** evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

3. **Long-term Effectiveness and Permanence** considers the ability of an alternative to maintain protection of human health and the environment over time.

4. **Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment** evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

5. **Short-term Effectiveness** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

6. **Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. **Cost** includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. **State/Support Agency Acceptance** considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

9. **Community Acceptance** considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

EVALUATION OF ALTERNATIVES

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Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select the preferred remedial alternative. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration. The nine evaluation criteria are described in the text box. The Detailed Analysis of Alternatives can be found in the FS report.

1. Overall Protection of Human Health and the Environment

Soils

The No Action Soil Alternative SO1 is not protective of human health and the environment because it allows continued leaching of TCE to groundwater. Soil Alternative SO2 relies primarily on the cap covering to meet the first two remedial action objectives, and on the natural attenuation of contaminants to reduce impacts to groundwater. It is considered protective of public health and the environment because the cap would minimize the potential for exposure to the contaminated soils.

The remaining soil alternatives are considered protective of public health and the environment. Soil Alternatives SO3 and SO4 use in-situ treatment to remove the majority of TCE present in the source areas. Soil Alternative SO4 uses excavation and off-site disposal to a large extent, as well as in-situ treatment to achieve the same result.

Groundwater

The No Action Groundwater Alternative GW1 is not considered protective of human health and the environment because it does not reduce contamination, or include groundwater monitoring to determine the fate and transport of the plume over time, and is without any means to evaluate the time until remediation goals are met. Future exposure to groundwater could result in unacceptable and uncontrolled risks to the public.

The remaining alternatives are considered protective. Groundwater Alternatives GW2 and GW3 have components of natural attenuation with long-term monitoring for the downgradient portion of the plumes, whereas, GW4 does not include natural attenuation because it includes treatment of the entire plume. Each alternative includes more aggressive remediation in the upgradient groundwater "hot spots" of contamination.

2. Compliance with ARARs

Major applicable ARARs for the site are listed below.

Chemical ARARs: NJDEP Soil Cleanup Criteria (N.J.A.C. 7-26D) - TBCs for Soil - Federal MCLs (40 CFR 141)- ARARs for Groundwater NJDEP GWQS (N.J.A.C. 7:9-6).

Action ARARs: Federal Safe Drinking Water Act (40 CFR 144); Underground injection permitting NJDEP GWQS (N.J.A.C. 7:9-6) - Treatment standards for re-injection of groundwater; National Contingency Plan (CERCLA) - (40 CFR 300, Subpart E) - General Remediation; NJDEP Technical Regulations (N.J.A.C. 7:26E) - General Remediation in New Jersey.

Location ARARs: National Historic Preservation Act (16 U.S.C. 470) - Preserving historic places (Morris Canal); Wetlands Act of 1970 (N.J.S.A. 13:9A-1 et.seq.) - Protection of wetlands.

A full list of ARARs is included in Appendix B of FS.

Soils

All the alternatives other than the No Action Alternative, SO1, are expected to meet ARARs. The remedial goal for TCE in soils is 1 ppm, which is a number developed by the NJDEP to assure protection of groundwater. This standard is more stringent than the TCE - residential/non-residential direct contact remedial goals of 23 ppm and 54 ppm, respectively. Action-specific ARARs would be met under Soil Alternatives SO2, SO3, and SO4.

Groundwater

With the exception of the No Action Groundwater Alternative, GW1, each groundwater alternative satisfies the ARARs.

All alternatives that involve active groundwater treatment, GW2, GW3, and GW4, would restore the aquifer to cleanup standards in less time than Alternative GW1. Air treatment for emissions from treatment plants to meet Clean Air Act and applicable NJDEP ARARs may be required for GW2, GW3, and GW4.

3. Long-term Effectiveness and Permanence

Soils

The long-term effectiveness and permanence of the alternatives vary largely as a result of the adequacy and reliability of the systems implemented. Soil Alternative SO4 is expected to achieve the greatest removal of TCE from the soils in the shortest period of time, however,

both Alternatives SO3 and SO4 are expected to achieve long-term effectiveness.

Alternative SO3 is rated somewhat lower than Soil Alternative SO4 for long-term protectiveness because the amount of soils that will be excavated is less, and the alternative relies more heavily on the DPE technology which may not effectively remove all of the TCE as excavation would. However, DPE remediation is expected to continue until remedial goals are achieved, and the shallow soil mixing included in Soil Alternative SO3 will improve removal effectiveness in anticipated silt and clay soils, while allowing the areas of greatest TCE contamination to be identified and more precisely targeted for remediation. In addition, the fracturing of the deeper underlying silt and clay soils will aid TCE removal via DPE, where removal will be more difficult.

Soil Alternative SO2, Capping, is not as effective in the long-term as Alternatives SO3 and SO4 because residual contamination remains on-site and maintenance of the cap would be required to ensure the long-term effectiveness of the cap. In addition, this alternative would have no effect on the contaminant area believed to be located below the ANC building foundation, known as ANC C, which may be already capped or partially capped by the building.

Soil Alternative SO1 is considered the least effective alternative because it will not remove TCE or limit further leaching of contamination into the groundwater.

Groundwater

The long-term effectiveness and permanence of the extraction and ex-situ treatment Groundwater Alternatives GW2, GW3 and GW4, are better than Alternative GW1, because these involve the active reduction of TCE and PCE concentrations in groundwater near the highest areas of contamination, over a shorter time frame.

The groundwater collection and treatment alternatives, GW2, GW3 and GW4, are similar in their long-term effectiveness and permanence due to the relatively high rates of pumping and treatment of groundwater. Groundwater Alternative GW4 ranks higher in long-term effectiveness and permanence because a larger mass of TCE and PCE in groundwater near the original sources would be actively removed. Alternative GW2 will take longer than GW3 to achieve remediation goals, while Alternative GW4 will take the shortest amount of time.

The remaining alternative, GW1, the No Action Groundwater Alternative, is not considered to be effective in the long term.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Soils

Soil Alternative SO3 relies on active treatment (DPE), which is more protective of human health and the environment by reducing the volume of soil contamination more than Soil Alternatives SO1 (No Action), and SO2 (capping). Soil Alternative SO3 will eliminate continued leaching of contamination to groundwater, whereas, Soil Alternatives SO1 and SO2 do not actively treat impacted soil which will continue to impact groundwater. Soil Alternative SO3 does not require engineering and institutional controls after treatment that would be needed with Soil Alternatives SO1 and SO2. The time of remediation is much shorter for Soil Alternative SO3 when compared to Soil Alternative SO2. Soil Alternative SO3 will allow unrestricted use of the area after treatment. Soil Alternatives SO1 and SO2 would limit future use since engineering and institutional controls will be needed.

Treatment is not included in Soil Alternatives SO1 or SO2; therefore, these alternatives are considered the least effective in terms of this criteria.

Soil Alternatives SO3 and SO4 include treatment of soils to remove and destroy TCE. Soil Alternative SO4 offers the greatest potential reduction in TCE mass because it relies more heavily on excavation, which completely removes contaminated soil in accessible areas, and uses a proven technology (DPE) to remediate the remaining less accessible source areas. Soil Alternative SO3 would also be effective at reducing TCE mass because it relies on excavation, and homogenizes the soil and allows areas of greatest contamination to be more accurately delineated and targeted for DPE treatment.

Higher contaminant mass removal of TCE at shallow depths with Soil Alternative SO4, compared to SO3; however, below 20 feet, the removal will be the same because both will employ the same DPE treatment.

Soil Alternative SO3 reduces the volume of shallow contaminated material through in-situ treatment, whereas Soil Alternative SO4 involves removal of shallow contaminated soils for landfilling and in-situ treatment for contaminated soils below 20 feet.

Groundwater

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Groundwater Alternative GW4 is the most effective alternative for the reduction of contaminant mass because it removes and destroys the most TCE and PCE, through treatment prior to reinjecting into the aquifer. Groundwater Alternatives GW2 and GW3 also remove TCE and PCE within the targeted cleanup areas to below the cleanup goals. The targeted TCE and PCE cleanup areas for Alternative GW2 is smaller than for either Alternative GW3 or GW4, but it contains more concentrated contamination than would be treated by these alternatives. Each of these alternatives captures less groundwater than Groundwater Alternative GW4, which treats the entire groundwater plume that exceeds a concentration of 1 ppb for TCE and PCE. Groundwater Alternative GW1 does not reduce contaminant mass through treatment.

5. Short-term Effectiveness

Soils

All soil alternatives have minimal short-term impacts with respect to the protection of workers, the community and the environment during remedial construction, assuming adequate monitoring is conducted and mitigative actions are taken.

Soil Alternatives SO3 and SO4 will potentially have an adverse effect on the areas adjacent (and downgradient) to ANC A since re-routing of storm water away from that area may be necessary, as these are low lying areas where water collects. The type of storm water controls necessary would be evaluated during the remedial design phase.

Air monitoring in the vicinity of the work zone would be important for the shallow soil mixing of Soil Alternative SO3 and the excavation in Soil Alternative SO3 and SO4, to evaluate the appropriate level of personal protective equipment for workers. In addition, emission control techniques such as the use of dust suppressants and minimizing the open working area of the excavation would be employed as needed to minimize adverse effects on workers and the community from volatile emissions of TCE.

The time to achieve the RAOs is estimated to be 1 to 2 years for Soil Alternatives SO3 and SO4, but could take longer. Under Soil Alternatives SO1 and SO2, RAOs may not be achieved for decades or longer because of the slow leaching of contaminants to groundwater.

Groundwater

The No Action Groundwater Alternative, GW1, has no short-term impacts because it involves no remedial action.

Groundwater Alternative GW4 is considered to have the greatest negative short-term impact, because the large volumes of water extracted may promote dewatering within the valley, which could lessen recharge to streams, and damage natural resources such as the tributaries and wetlands along Pohatcong Creek. The implementability of this alternative is also considered to be poor because of the number of extraction wells required (approximately 30) and the number of large treatment systems that would require multiple operators on a daily basis, as well as numerous lengthy piping runs to some extraction, treatment and reinjection systems, that may interfere and be disruptive within the developed portions of Washington Township.

Groundwater Alternatives GW2 and GW3 have minimal impacts with respect to the environment, the protection of workers during remedial construction, and the protection and disruption of the community during remedial action.

The time until RAOs are achieved is shortest for the groundwater collection and treatment alternatives, GW2, GW3 and GW4, because these alternatives will actively reduce the concentrations of contaminants in groundwater. Groundwater Alternatives GW2 and GW3 are similar in terms of time frames and short-term effectiveness related to time until RAOs are met, estimated at 55 and 47 years, respectively. The time to achieve RAOs is longest for Alternative GW1, which would take greater than an estimated 60 years, and shortest for GW4, estimated at 22 years.

6. Implementability

Soils

The main technical implementability challenge for Soil Alternative SO2 would be to design permanent storm water controls to minimize the potential for infiltration and lateral flow to areas below the cap. Surface water controls may cause drainage changes as well as require other expensive storm water controls. Soil Alternatives SO3 and S04 also require temporary storm water controls to minimize water infiltration through the ANC A area during implementation of the DPE cleanup, though these are not as critical as in Soil Alternative SO2. Adequate fracturing of silt and clay soils to achieve good air flow is a technical challenge for Soil Alternatives SO3 and SO4. All alternatives are expected to have some level of impact on present company operations at the ANC facility. However, fracturing soils beneath the existing building has been determined to most likely be infeasible due to structural stability concerns. In addition, Soil Alternative

S04 has major implementation challenges and would be very difficult to implement due to the limited accessibility to impacted soils underneath the present building. It would also require costly and extensive structural stabilization during excavation at ANC A and ANC C. Soil Alternative SO3 is much easier to implement when compared to Soil Alternative SO4 since this is an in-situ alternative and excavation would be minimal.

Groundwater

Groundwater Alternative GW2 is easier to implement when compared to both Groundwater Alternatives GW3 and GW4, due to the lesser volumes of water to be extracted and treated. The additional water will require more or larger treatment systems to be constructed in the built up portions of Washington Township, as well as much more involved extensive operation and maintenance and greatly increased cost. Moreover, the estimated time frame for remediation is not significantly reduced between Groundwater Alternatives GW2 and GW3 (from 55 to 47 years): however, the volume of water to be treated is tripled.

Groundwater Alternative GW4 may require excessive disruption of local streets and infrastructure during implementation, and for future repairs that will be necessary during the long-term operation and maintenance of the system. The siting of the numerous required treatment plants may pose challenges for Groundwater Alternatives GW3 and GW4. The large quantities of extracted groundwater in Groundwater Alternative GW4 may also present technical difficulty in terms of handling and reinjection. Permitting at the state and local levels will likely be much more difficult when compared to Groundwater Alternatives GW2 and GW3, due to the larger volume of water being extracted and treated, and the greater potential for negative impacts. The additional volumes of water will require multiple extraction and treatment systems throughout the Valley. With Groundwater Alternative GW4, there is also a real potential to damage natural resources in the valley, such as dewatering of local surface water bodies and streams. This would also place severe limits on water use by the municipal supply wells, production wells, and local irrigation wells. Access requirements for the construction of the large number of extraction and systems and the lengthy piping runs to these systems would be extensive throughout the valley. The costs for implementing Groundwater Alternative GW4 are nearly six times higher than Groundwater Alternative GW2, however, the time of remediation is only cut in half.

Alternatives GW3 and GW4 are much more difficult to implement than Alternative GW2. The mass reduction of TCE and PCE in groundwater is estimated to be the same through the life of the remedial action.

7. Cost

Soils

The No Action Soil Alternative SO1 has the lowest present worth cost of $0. Soil Alternative SO2, Cap Cover, is the next least expensive alternative in terms of present worth, costing $1,240,000. Soil Alternative SO3's present worth cost is $4,400,000, and that of Soil Alternative SO4 is $10,400,000.

Groundwater

The No Action Groundwater Alternative, GW1, has the lowest present worth cost of $0. The present worth cost for Alternative GW2 is much lower than for Alternatives GW3 and GW4. The present worth cost for Alternative GW2 is $8,060,000, and for Alternative GW3, $25,760,000. Alternative GW4 is the most expensive alternative at $46,840,000, significantly more than the other alternatives.

8. State/Support Agency Acceptance

The State of New Jersey is still evaluating EPA's preferred alternative presented in this Proposed Plan, with respect to the State's ISRA program. The NJDEP has an ISRA Remediation Agreement with the PRP for the ANC facility, and under this program, the NJDEP will be requiring the PRP to collect comprehensive data that EPA plans to use in the design for the soils part of the remedy. EPA will be coordinating activities with the NJDEP so as to avoid duplication of effort and maximize results.

9. Community Acceptance

Community acceptance of the preferred alternatives will be evaluated after the public comment period ends and will be described in the Responsiveness Summary of the Record of Decision (ROD), the document that officially formalizes the selection of the remedy.

SUMMARY OF THE PREFERRED ALTERNATIVE

Soil

Soil Alternative SO3 is EPA's and NJDEP's preferred remedial alternative for contaminated soils and includes DPE and excavation for the source areas.

Prior to installation of the DPE system at source areas, the source areas will be further characterized, and impacted

soils to a depth of approximately 20 feet would be mixed to homogenize the soil and increase air flow and permeability. The exact extent of soil contamination at ANC C will be determined based on sampling during the Remedial Design phase. Because of the limited horizontal and vertical extent of contamination at ANC B, soils in this area will be excavated and disposed of off-site. The excavations will be backfilled with certified clean fill material. Soil sampling will also be conducted to verify the effectiveness of the remedy.

Alternative SO3 minimizes leaching of contaminants to groundwater, prevents risks from direct contact to contaminated media, and limits erosion of contaminated soils by treating contaminated soil to below the 1 ppm cleanup goal. This alternative will eliminate the need for long-term monitoring or institutional controls after treatment and will not limit future use of the source areas after completion of the remedial actions.

Groundwater

Groundwater Alternative GW2 is the preferred remedial alternative for groundwater. This includes pumping and treatment of the most contaminated part of the TCE plume (concentrations exceeding 500 ppb) using a series of extraction wells along the downgradient edge of this source area. The TCE groundwater extraction system is expected to consist of three high yield extraction wells, each pumping at approximately 140 gallons per minute (gpm) to address the TCE-contaminated groundwater. The PCE groundwater extraction system is expected to consist of one extraction well, pumping at approximately 100 gpm. Total generated groundwater for both systems is expected to be approximately 520 gpm, which is roughly 749,000 gallons per day. Extracted water will be treated using air stripping (transferring TCE and PCE from liquid to vapor phase) prior to reinjection into the regional aquifer. Natural attenuation with long term monitoring will be used in the downgradient parts of the TCE and PCE plumes to reduce contamination to below the remedial goals for each of 1 ppb.

If, during implementation, any residences or businesses within the aerial extent of the OU1 plume are found to have not yet been connected to public water, EPA would offer to connect them, and seal their wells. Industrial and irrigation water wells in the area would also be evaluated, and a determination will be made regarding their continued use, including the possibility of either closure or treatment prior to use.

Institutional controls would be required to prevent the installation of wells in the contaminated groundwater, at least while the remedy is being implemented, and a review of the remedy every five years would also be required. Furthermore, potential groundwater users are protected by being provided with a public water supply.

The Preferred Alternative was selected over the other alternatives because it is expected to achieve substantial and long-term risk reduction through treatment and is protective of human health and the environment. The Preferred Alternative would reduce risk within a reasonable time frame, and at comparably less cost to other remedies and provide a long-term reliable remedy.

Based on the information available at this time, EPA and the State of New Jersey believe the Preferred Alternative would be protective of human health and the environment, would comply with ARARs, would be cost-effective, and would utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Because the Preferred Soil Alternative would treat most of the highly contaminated source areas, the remedy would also meet the statutory preference for selection of a remedy that involves treatment as a principal element.

COMMUNITY PARTICIPATION

EPA and the State of New Jersey provide information regarding the cleanup of the Pohatcong Valley Superfund Site to the public through public meetings, the Administrative Record file for the site, and announcements published in the Express Times newspaper. EPA and the State encourage the public to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted there. The dates for the public comment period, the date, location and time of the public meeting, and the locations of the Administrative Record files, are provided on the front page of this Proposed Plan. EPA Region 2 has designated a point-of-contact for community concerns and questions about the Superfund program. To support this effort, the Agency has established a 24-hour, toll-free number the public can call to request information, express concerns or register complaints about Superfund. The Public Liaison Manager for EPA's Region 2 office is:

George H. Zachos
Toll-free (888) 283-7626
(732) 321-6621
U.S. EPA Region II
2890 Woodbridge Avenue, MS-211
Edison, New Jersey 08837

500229

For further information on the Pohatcong Valley Superfund Site, please contact:

Stephen Cipot	Patricia Seppi
Remedial Project Manager	Community Relations
(212) 637-4411	(212) 637-3679

U.S. EPA
290 Broadway 19th Floor
New York, New York 10007-1866

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GLOSSARY

ARARs: Applicable or Relevant and Appropriate Requirements. These are Federal or State environmental rules and regulations that may pertain to the site or a particular alternative.

Carcinogenic Risk: Cancer risks are expressed as a number reflecting the increased chance that a person will develop cancer if exposed to chemicals or substances. For example, EPA's acceptable risk range for Superfund hazardous waste sites is 1×10^{-4} to 1×10^{-6}, meaning there is 1 additional chance in 10,000 (1×10^{-4}) to 1 additional chance in 1 million (1×10^{-6}) that a person will develop cancer if exposed to a site contaminant that is not remediated.

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act. A Federal law, commonly referred to as the "Superfund" Program, passed in 1980 that provides for response actions at sites found to be contaminated with hazardous substances, pollutants or contaminants that endanger public health and safety or the environment.

COPC: Chemicals of Potential Concern.

ERA: Ecological Risk Assessment. An evaluation of the risk posed to the environment if remedial activities are not performed at the site.

FS: Feasibility Study. Analysis of the practicability of multiple remedial action options for the site.

Groundwater: Subsurface water that occurs in soils and geologic formations that are fully saturated.

HHRA: Human Health Risk Assessment. An evaluation of the risk posed to human health should remedial activities not be implemented.

HI: Hazard Index. A number indicative of noncarcinogenic health effects that is the ratio of the existing level of exposure to an acceptable level of exposure. A value equal to or less than one indicates that the human population is not likely to experience adverse effects.

HQ: Hazard Quotient. HQs are used to evaluate noncarcinogenic health effects and ecological risks. A value equal to or less than one indicates that the human or ecological population are not likely to experience adverse effects.

ICs: Institutional Controls. Administrative methods to prevent human exposure to contaminants, such as by restricting the use of groundwater for drinking water purposes.

Nine Evaluation Criteria: See text box on Page 10.

Noncarcinogenic Risk: Noncancer Hazards (or risk) are expressed as a quotient that compares the existing level of exposure to the acceptable level of exposure. There is a level of exposure (the reference dose) below which it is unlikely for even a sensitive population to experience adverse health effects. USEPA's threshold level for noncarcinogenic risk at Superfund sites is 1, meaning that if the exposure exceeds the threshold; there may be a concern for potential noncancer effects.

NPL: National Priorities List. A list developed by USEPA of uncontrolled hazardous substance release sites in the United States that are considered priorities for long-term remedial evaluation and response.

Operable Unit (OU): a discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site.

Present-Worth Cost: Total cost, in current dollars, of the remedial action. The present-worth cost includes capital costs required to implement the remedial action, as well as the cost of long-term operations, maintenance, and monitoring.

Proposed Plan: A document that presents the preferred remedial alternative and requests public input regarding the proposed cleanup alternative.

Public Comment Period: The time allowed for the members of a potentially affected community to express views and concerns regarding USEPA's preferred remedial alternative.

RAOs: Remedial Action Objectives. Objectives of remedial actions that are developed based on contaminated media, contaminants of concern, potential receptors and exposure scenarios, human health and ecological risk assessment, and attainment of regulatory cleanup levels.

Record of Decision (ROD): A legal document that describes the cleanup action or remedy selected for a site, the basis for choosing that remedy, and public comments on the selected remedy.

Remedial Action: A cleanup to address hazardous substances at a site.

RI: Remedial Investigation. A study of a facility that supports the selection of a remedy where hazardous substances have been disposed or released. The RI identifies the nature and extent of contamination at the facility and analyzes risk associated with COPCs.

SVOC: Semi-Volatile Organic Compound. Type of chemical that somewhat vaporizes, often producing a distinguishable odor.

TBCs: "To-be-considereds," consists of non-promulgated advisories and/or guidance that were developed by EPA, other federal agencies, or states that may be useful in developing CERCLA remedies.

USEPA: United States Environmental Protection Agency. The Federal agency responsible for administration and enforcement of CERCLA (and other environmental statutes and regulations), and final approval authority for the selected ROD.

VOC: Volatile Organic Compound. Type of chemical that readily vaporizes, often producing a distinguishable odor.

ATTACHMENT B

PUBLIC NOTICE

U.S. ENVIRONMENTAL PROTECTION AGENCY REGION II INVITES PUBLIC COMMENT

Proposed Cleanup for the Pohatcong Valley Superfund Site Operable Unit One Washington Township, Warren County, New Jersey

The United States Environmental Protection Agency (EPA) announces the opening of a 30-day public comment period on the Proposed Plan and Remedial Investigation/Feasibility Study (RI/FS) Reports for the Pohatcong Valley Groundwater Contamination Superfund Site, located in Warren County, New Jersey. EPA's plan addresses the cleanup of groundwater contaminated with Trichloroethylene (TCE) and Tetrachloruethylene (PCE) and TCE contaminated soils, and provides a rationale for those preferences. As part of the public comment period, EPA will hold a public meeting on **August 4, 2005 at 7:00 p.m.** in the **Warren County Vocational Technical School located on Route 57, at the border of Washington and Franklin Townships.** During the meeting, EPA will present its proposed cleanup plan, and the public will be able to comment on the proposed plan to EPA officials. A final copy of the Operable Unit 1 RI/FS Reports and the Proposed Plan may be reviewed at the Warren County Health Department Office, 315 West Washington Avenue, Washington Borough, New Jersey, and the EPA Region II Records Center located at 290 Broadway, 18th Floor in New York City.

As the lead agency, EPA divided the site into two Operable Units (OUs). The first Operable Unit addresses TCE and PCE contaminated groundwater, and the potential sources of the groundwater contamination, within portions of Washington Borough, and Washington and Franklin Townships. The second Operable Unit will address contaminated groundwater within the southwestern portion of the Pohatcong Valley. Field work for the second Operable Unit investigation will be initiated in the near future to determine the extent of TCE contaminated groundwater. This notice solely concerns the proposed remedy for the first Operable Unit, as outlined above.

Based upon the results of the first Operable Unit RI/FS, EPA prepared a Proposed Plan that describes all the cleanup alternatives and provides EPA's rationale for recommending these alternatives. EPA evaluated the following four soil cleanup alternatives:

Alternative SO1: No Action
Alternative SO2: Capping and Institutional Controls
Alternative SO3: Dual-Phase Extraction and Shallow Soil Mixing, with Limited Excavation
Alternative SO4: Excavation and Off-Site Disposal

EPA evaluated the following four groundwater alternatives:

Alternative GW1: No Action
Alternative GW2: Source Treatment and Natural Attenuation
Alternative GW3: Expanded Source Treatment and Natural Attenuation
Alternative GW4: Entire Plume Capture and Treatment

EPA recommends Alterative SO3 to address the TCE contaminated soils in the source areas, and Alternative GW2 to address the TCE and PCE contaminated groundwater, as outlined in the Proposed Plan. Alternative SO3 includes active treatment and limited excavation of the contaminated soils that are source areas for groundwater contamination. Alternative GW3 includes the installation of a series of groundwater extraction wells, as well as a treatment and reinjection system to treat the most contaminated parts of the TCE and PCE groundwater plumes. Extracted water would be treated to meet remedial goals of 1 part per billion (ppb) for each contaminant, and reinjected back into the regional aquifer. Natural attenuation and long term monitoring will be used in the lesser contaminated portions of the plume to reduce contamination to below remedial goals or 1 ppb for each.

EPA's Preferred Alternatives for soils and groundwater are described in more detail in the Proposed Plan.

Before selecting a final remedy, EPA and the New Jersey Department of Environmental Protection will consider all written and oral comments on this preferred remedy. All comments must be received on or before August 26, 2005. The final decision document, or Record of Decision, will include a summary of public comments and EPA's responses. Comments will be accepted in person at the public meeting and/or in written form through August 26, 2005. Please address all written comments to:

Stephen Cipot
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866
212-637-4411
Cipot.Stephen@EPAmail.EPA.gov

ATTACHMENT C

PUBLIC MEETING TRANSCRIPT

POHATCONG VALLEY GROUNDWATER CONTAMINATION SUPERFUND SITE OPERABLE UNIT 1 STUDY AREA WARREN COUNTY, NEW JERSEY

Remedial Investigation, Feasibility Study, and Proposed Plan Public Meeting U.S. Environmental Protection Agency, Region 2

Taken at Warren County Vo-Tech School, Route 57, Washington, New Jersey, on Thursday, August 4, 2005, commencing at 7:00 p.m., by Charleen A. Eyer, Registered Professional Reporter.

APPEARANCES:

MURRAY ROSENBERG, CH2M HILL
STEPHEN CIPOT, EPA RPM
PAT SEPPI, EPA PAD
KIM O'CONNELL, EPA
ROB ALVEY, EPA Geologist
CHUCK NACE, EPA Toxicologist

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ORIGINAL

MS. SEPPI: I really appreciate you being here on time, especially coming in on a night like this. Maybe it's not so bad being here in an air conditioned room. We were so relieved when we got here and found out that the air conditioner was working.

My name is Pat Seppi, I'm a community involvement coordinator with EPA. Our main office is in New York City. I would like to ask the other people who are here this evening, as part of the presentation, to introduce themselves and tell them how they're related to the Pohatcong site.

MR. CIPOT: My name is Stephen Cipot. I am the EPA project manager for the Pohatcong site.

MS. O'CONNELL: I'm Kim O'Connell and I'm a supervisor for the Superfund Program for the EPA.

MR. ALVEY: I am Rob Alvey, I am a geologist in the Superfund Program, and I have worked on the Pohatcong Valley project.

MR. NACE: My name is Chuck Nace, and I am a toxicologist and I am working on the risk assessment for the site.

MR. ROSENBERG: I'm Murray Rosenberg, and I work for CH2M HILL, which is a contractor to EPA, and I'm the project manager.

MS. SEPPI: Thank you. Before we go any further, let me just mention that Charleen is our stenographer. We're going to try to do this without microphones. I would ask that us, as well as you, that you would speak up at the end when you ask your questions. She might ask you to stop and repeat your name, but that's why she's here tonight to take down all the comments that you're going to be giving us later.

I just wanted to thank first a couple people who were instrumental in helping us set up the meeting here tonight from the Warren County Environmental Commission, Al, and Cheryl Burkett. Thank you very much, we really appreciate this is wonderful room for a public meeting.

Also a couple from the staff of the vocational school here, Greg and Scott, and I don't know if they're here tonight. I know Greg isn't, but I thought Scott might be her, but anyway, thank you, also.

The reason we're here tonight is to talk about the alternatives that EPA has chosen to clean up the contaminated soil and contaminated groundwater at that site. But the other reason we're here is to hear your comments and your input on our plan.

Now, probably some of you haven't seen the plan until you picked it up tonight. That's why we have a long-term comment period. It started on July 27th and it's going to end on August 26th. So any comments that we hear tonight, Charleen will be providing to us, but if you think of anything after you get home, you can certainly call or email or write Steve and his number and his email address are on that proposed plan. So please make sure that you take copy.

Also, I would appreciate if you would sign in. We're trying to develop a mailing list, so we'll be able to get in touch with you for further information about the site. So if you do sign the sign-in sheet, we'll be able to put together a much more comprehensive mailing list than we do have right now.

As I said, the meeting is being

transcribed. We would appreciate your comments. One thing we do have a couple presentations tonight, and we do try to keep them short, and I would like to ask your indulgence for one thing, if you wouldn't mind holding your questions to the end of the presentation.

I know there are probably a lot of questions. We'll try to go through our presentations as quickly as possible to leave as much time to answer all your questions -- hopefully answer all of your questions.

Then what we'll do after the presentations, we'll open it up to questions and answers and give you an opportunity to tell us how you feel about this plan.

So I think right now I would like to turn this over to Steve, and he's going to give you a little bit about the history of the site. Steve.

MR. CIPOT: Thank you. All right. Welcome everyone. Can everybody hear me okay? Okay. We're going to be talking about the Pohatcong Valley Superfund Site Operable Unit 1 remedy.

We've also opened up Operable Unit

2 recently, which I'm going to talk about a little bit later and that's going to be handling what we call the downgradient or the southern part past the Operable Unit 1 area.

So let's just go to this map which is also on the handout that you have, we're going to call it our handout, this -- the green outline, which doesn't show up very well on the overhead, that's the Operable Unit 1 boundary. This area up here is Washington Borough. Here we have Route 31 here, and here is the intersection with 57 coming on down.

We're located about here on the map, and this area below that, which is the broken line, is Operable Unit 2, and it goes off the map a little bit, and I'll talk about that a little bit later.

We have public water supply wells here and here, and these are right here and here. And these are the two wells that were contaminated in the past with TCE and PCE.

And, basically, for a very brief history, and we can go into more details later, in the late 1970's, volatile organic chlorinated compounds, trichloroethylene or ethene, they're

both synonyms, excuse me if I use both of them. One is TCE, and tetrachloroethylene or PCE or perc, tetrachloroethylene, they're all synonyms, were detected in two public water supply wells, the Dale Avenue and the Vannatta Street wells.

On or about that time, treatment of the water supply was initiated by water companies, and the Department of Environmental Protection, the New Jersey Department of Environmental Protection defined a well restriction area in 1985 and also started to extend the public water supply which continued through 1988 and 1989.

The Warren County Department of Health and the New Jersey Department of Environmental Protection did continue to conduct groundwater sampling to define the extent of the groundwater contamination.

The site was listed on the national priorities list of 1989, and in the early 1990's, EPA initiated Operable Unit 1 Remedial Investigation and Feasibility Study work for the site.

EPA began reviewing site background information that was available from

the Warren County Department of Health and from the DEP, and at that time EPA developed a list of 107 what we call potential source area facilities that would be evaluated in more detail as possible sources of the chlorinated VOC's and other contaminates.

And as the RI was being conducted, it was an iterative process, as the EPA received data, 8 new PSA's or potential source area facilities were also added to the list.

Between 1999 and September 2003, EPA conducted the fieldwork part of the study and three phased investigations looking at the list of 107 PSA's and narrowing them down to determine which ones were contributing or had contributed to the groundwater plume.

The purpose of the RI was to determine the nature and extent of groundwater contamination for chlorinated VOC's.

During the process, EPA selected 45 facilities to investigate in detail during the fieldwork phase, and these were based on a combination of things, site investigations, site operations, something that we call 104E responses, site location related to the plumes

and site visits were made. Those were two phases of field work.

During the last and final phase of field work, which ended in September of 2003, 16 of the original list of PSA facilities or potential source area facilities were looked at in much greater detail during the investigation.

Now, it was a very large and comprehensive study. The site, as you know, is approximately eight and two-thirds miles. It covers a very large area. There were a large number of facilities. The potential facilities that we actually investigated in the field, just to give an idea of what we looked at, were 45.

We installed 45 monitoring wells which were in addition to wells that were already in place.

We drilled 152 soil borings. The total feet that were drilled was 9,133. We collected 93 soil gas samples, and we also collected total soil samples from soil media were 399. We collected 286 groundwater samples. 107 were from monitoring wells, another 59 were from temporary well points, which were installed and then removed at pretty much the same time.

We sampled 35 domestic wells. We also took a number of other tests to look at different zones within the aquifer in all, for a total of 286. We took sediment samples from streams, and we took 21 of those samples and surface water samples 43, and the total samples were 842.

Even though we were looking for only primarily TCE and PCE, we subjected all samples to the full suite of analysis, which is 136 standard tests for volatile organic compounds, semi-volatile organic compounds and also metals.

That's pretty much a good brief interview of the RI process that we went through.

I would like to bring Murray Rosenberg, our contractor, back up to discuss the RI findings a little bit.

MR. ROSENBERG: Thank you, Stephen. We wanted to go right to the findings basically for the remedial investigation and, as such, there were two groundwater plumes that were identified. One, a large one of TCE, and the other one, which is smaller, is PCE.

And the New Jersey Department of Environmental Protection Groundwater Quality Standard for those compounds are both one part per billion. Anything over that is subject to removal or treatment.

The highest TCE concentrations that were found in the Pohatcong Valley were immediately downgradient and adjacent to the former American National Can facility on North Route 31, north of 57.

And the plume within the Operable Unit 1 extends the full length of that area, which is about five miles long, and we have detections that go to about 3500 feet wide.

The highest PCE concentrations were concentrated within the Borough of Washington from two existing dry cleaners. One is right on Main Street there called L&L Econowash and the other is Modern Valet Service. And the plume for the PCE is about one and a half mile long and up to 500 feet wide.

Most of the PCE detections were limited to the business district of Washington Borough.

This is a map of the groundwater

concentration contours, so anything within one of those lines is of equal or greater concentration starting with where the yellow kidney bean is. Where the yellow kidney bean is, is where the highest concentrations were that were found in the Valley.

And this is, again, just to orient you, this is the boundary of Washington Borough, and here is Route 57, this way and 31.

This portion here is just a blowup of this smaller area there, and you can see the 500 contour line is colored in and so the expectation is that within that contour line, it's 500 part per billion or greater.

The highest concentration that we found in any of the wells was at 2,100 part per billion, and that was on immediate downgradient property that's known as Vikon Tile. It's about -- looking at the PCE plume, this is actually within the borough.

Again, here is Route 31 and 57 and this contour line here, which is 25 part per billion, significantly less than the 500 part per billion that we were looking at in the previous one, defines where the two potentially

responsible parties are, the L&L Econowash and Modern Valet Service. And you'll notice right at the bottom of the contour is where the public supply well is.

One sample that we collected from a temporary well point at about 75 feet below the surface was right behind the L&L facility, and it was only -- it was only a temporary well point where you put a boring in and you have a screen within the drill rods and you collect a water sample through that.

There is no permanent monitoring well there, but the result there was 1500 part per billion. So that's -- we feel that that may be very close to the source area.

So going -- moving into the soil findings, the highest -- well, first of all, the TCE found in the soil, anything above the New Jersey's cleanup criteria, soil impact to groundwater, soil cleanup criteria of one part per million is basically the trigger or action level.

Again, at the former National American Can facility, adjacent to that facility and on that facility, through historic

information, there were several locations where concentrations exceeded the one part per million.

Two soil areas were identified specifically from our sampling events, and they are identified as A and B, and on the next figure I'll show you where those are.

The third soil area we believe is either in the vicinity or underneath the existing ANC building, and that's based on what we have been able to understand from historic operations, previous soil remediation activities there, the proximity to highest groundwater contamination, the direction in which groundwater flows or the groundwater gradient, and then some calculations that we did based on the chemical concentrations.

As we noted, there were PCE detected in the soil, but at concentrations below one part per million, so it doesn't reach that level that New Jersey DEP would require a cleanup, and those facilities, as noted, were the L&L Econowash facility, Modern Valet Service and Tung Sol Tubing, which is south along Route 31.

This one is hard to see. I do have another copy of that here for you to look closer, but really what I wanted to do was just draw your attention with yellow boxes to show you which analyses exceeded the one part per million action level, and they were focused in this area here, as well as up in this area here.

Previous studies, I mentioned from historic information, concentrations up to 400 part per million were in this area of the American Can facility.

This is the map of mostly Washington Borough with the former American National Can facility here. We have identified these two areas, area A and area B based on the concentrations that were detected there. The highest concentration was in area A and that was at 52 part per million.

And just in relation -- and I'm sorry, the suspected area C is the other area that we think may be contributing contamination to the groundwater plume.

The other facilities, the PCE facilities are down in this area of the borough. Here is L&L Econowash and Modern Valet service.

They almost share a parking lot. They're very close to one another. The Vannatta Street public supply well is right there, across Route 57 and the Tung Sol Facility is listed here as TVN, but, again, those facilities had concentrations less than one part per million in the soil.

I'm going to turn the program back over to Stephen. He'll talk about enforcement and the feasibility study.

MR. CIPOT: As Murray mentioned, we -- based on the RI findings, three companies were notified that we believe that they are potential responsible parties for the site 10 Groundwater contamination, and it's based on their owner and operations of the facilities.

The first one is related to the TCE contamination, it's the former American National Can facility, and it's -- we notified Pechiney Plastics Packaging, Incorporated.

For the PCE we notified L&L Econowash Cleaners and also Modern Valet Services both for PCE. Murray mentioned this other facility down here, Tung Sol, that might have been a previous contributor of PCE

historically, but we haven't been able to find any successors in that case at this point as far as our enforcement goes.

What we intend to do then -- now, once a remedy is selected, and that's why we're here tonight, is to bring the proposed preferred remedy, and after the public comment period, we have the option of revising the remedy based on public input and comment or going to a record of decision, which documents -- legally documents the remedy that we would like to implement.

And then at that point we would enter into negotiations with these companies and we would ask them, instead of expending public moneys, we would want them to participate in the cleanup. So that remains to be done at this point, but we have noticed the companies.

The next -- I just want to briefly talk about our future RI work, and it is ongoing. EPA has divided its site up into two operable units. We're here tonight to discuss the remedy for the first operable unit.

But in the early 2000 through 2003 range, the New Jersey Department of Environmental Protection continued sampling in

the area that's downgradient or southwest of our Operable Unit 1 boundary and sampled a number of residences down in that area and about 40 or so percent had come up with some type of hit of TCE, and that's the area that we opened up Operable Unit 2 in.

In the Operable Unit 2 area, we have some other boards, and it's also on the handout, so I don't have to flip back, but we can answer questions on that later. But in the Operable Unit 2 area, we started RI planning activities. We're in the work plan phase. We have a contractor on board.

We're going to be installing additional wells, monitoring wells. We're going to conduct groundwater sampling, and for another part of the effort we're going to do vapor intrusion studies for both Operable Unit 1 and the Operable Unit 2 areas.

We're also going to evaluate if the TCE, which was found in low concentrations in Operable Unit 2, range from nondetect to low to most mid-teens. And we do have some sample data on the boards that we can get into later that show where the detects are and those

amounts, but up from the nondetectable to low teens in parts per billion.

All right. We also conducted a human health and ecological risk assessment in the RI. We identified, through exposure routes of inhalation, direct contact with soil and the drinking of groundwater.

Human health risks include carcinogenic and noncarcinogenic effects. PCE and TCE are identified by EPA as potential carcinogens, and we looked at risks due to groundwater impact. They're considered to be site wide, because the plumes are more or less site wide, whereas the risks that are related to soils are related -- are contained -- are solely in the soil areas where TCE was located.

Again, as Murray mentioned, there was no PCE found at concentrations that were above the cleanup level, and the cleanup level for soils for PCE is one part per million. We didn't find anything at any potential source areas that are currently above one part per million. We also found no ecological risks.

Our risk toxicologist is here to discuss that in further detail later. I would

like to go into the feasibility study, that was the second half of the nature of the study that the EPA did, and we conducted a feasibility study to evaluate the types of methods and cleanup technologies for both soil and the groundwater contamination and also the purpose is to address the exposure pathways and any human health risks.

We looked at quite a number of areas cleanup technologies, and we compared them to each other, and then also by statute we compared them to what we call the nine criteria.

And the nine criteria -- these are the nine criteria here. Overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements, ARAR's, for example, the New Jersey one part per billion level for groundwater is a cleanup standard for groundwater or MCL's, maximum contaminate levels, would be another ARAR and for soils one part per million we use the impact groundwater cleanup that the state uses. Those would be examples of ARAR.

There are other types of ARAR's,

ecological ARAR's and location specific ARAR's. We also look at long-term effectiveness and permanence of a remedy. We look at the reduction of toxicity, mobility or volume of contaminates through treatment. We look at short-term effectiveness. We look at implementability. We look at costs and also state support and agency acceptance, and we also look at community acceptance, which is why we're here tonight, and that's the last criteria that we need to consider and evaluate before we come to a remedy.

We looked at a number of different technologies and alternatives, and we settled on four. We did a screening process and we looked at four in detail. The first one for soil is no action. We have to look at no action in all our remedies. It's a requirement.

We looked at capping and institutional controls, which we called SO2. We looked at dual phase extraction and shallow soil mixing SO3, with a limited excavation, and we looked at SO4, another option, which includes more excavation, basically, and off-site disposal.

We looked at also four groundwater alternatives again as options. We looked at source treatment and natural attenuation, and we looked at expanded source treatment and natural attenuation. And, finally, we looked at treating the entire plume, the capture and treatment of the entire groundwater plume.

After we select a remedy, we need to do a detailed design study just to let everybody know the process, and in that design study we need to collect detailed design information in order to more fully delineate the areas for engineering and costing purposes.

This is for both soil and groundwater and also the states ISRA program is also requiring the ANC, the potentially responsible party, to conduct more studies and we're coordinating our activities with the DEP as well.

Our preferred soil alternative we're calling SO3. After we developed and evaluated the four previously mentioned remedial alternatives in detail, we compared them to each other and to the nine criteria, we selected SO3 as our preferred alternative, and we're here for

community involvement and acceptance, and that's the ninth criteria.

And we believe that SO3 represents the best balance, in light of the nine criteria and the technologies that we looked at. SO3 includes a technology called dual phase extraction, which I'll mention in a minute, and it includes limited excavation of the source areas that were identified.

Prior to the installation of a DPE system at the source areas, there were three of them, two actually identified and a third that we suspect is maybe located underneath the building, and we can get into the reasons why we suspect it's there in the question and answer period.

The soil areas will be further characterized and the impact of soils to a depth of approximately 20 feet would be mixed and homogenized to break up the soil and to increase air flow, which is part of the dual phase extraction system and also increase permeability.

The deeper soils will be fractured, it's called pneumatic fracturing to

also increase the airflow from below 20 feet down to the depth the of the water table, and that area, the depth to water is about 100 feet, so we're including a pretty large column of soil we're treating, which is why we can't excavate the total depth of soils.

The extent of soil contamination at ANC, which is the suspected area around or underneath the building, will be based on more sampling.

The DPE system is basically drilling borings into the soil, advancing them down to the depth. This is the surface. These lines here would be the DPE borings that would be advanced down to the groundwater surface right about here. This depth is about 100 feet. This line here is about 20 feet.

These soils would be mixed with large augers or backhoes, and that area would receive what's called soil vapor extraction, which is basically putting a vacuum on these borings and sucking out the vapors.

It's a high pressure vacuum. Down in this area the soils would be more moist. The system would also take out the moisture, and as

you get closer to groundwater. You would be extracting some groundwater through different levels. They're different screen levels where the pipe is perforated to allow vapors and moister to enter into the pipes and go out through the surface. It will be treated at the surface. There will be a treatment system.

We believe the alternative SO3 will minimize the leaching of contaminates through groundwater, which we believe is still occurring. It prevents risks from the direct contact to contaminated media, and it limits the erosion of contaminated soils by treating the contaminated soils to below the one part per million cleanup level.

And this alternative will also eliminate the need for long-term monitoring institutional controls, which are restrictions put in deeds on properties. It will eliminate that, and it will -- there will be no limit for future use of the source areas after the areas have been cleaned up and remediated.

We also have a preferred alternative for groundwater, that's GW2. Again, we compared the alternatives to each other and

to the other nine criteria. We believe that GW2 presents the best balance of the nine criteria in terms of effectiveness.

GW2 consists of extracting groundwater at the most contaminated part of the plume. You may remember a previous slide where Murray showed a little kidney-shaped yellow area on the slide that was the 500 part per billion concentration line, where anything within that 500 parts per billion line would be treated, and that's the proposed treatment.

We would be using a series of -- right now we estimate three extraction wells along the downgradient edge of the source area, up around the former American National Can facility, and these three wells would be extracting approximately 140 gallons per minute, that's for TCE.

And for PCE, one extraction well would be located next to or very close to downgradient to the PCE source areas, so that would be extracting approximately 100 gallons per minute. Total for the four wells would be 749,000 gallons per day.

It would be treated using air

stripping, prior to re-injection back into the local regional aquifer after the cleanup standards have been met, which again, is one part per billion. For the rest of the plume, what we call the downgradient part of the plume, we would be using what's called natural attenuation with long-term monitoring in the downgradient parts of the plume, which over time would then be remediated to achieve the goals of one part per billion.

Basically, a quick schematic, this would be, say, for the TCE source areas, three extraction wells are advanced, there would be piping going to a treatment system and a clarifying tank and the air stripper.

And the water, once it's been treated, would be re-injected back into the ground, most likely upgradient.

This preferred alternative is expected to achieve substantial and long-term risk reduction through treatment, be protective of human health and the environment. The time frame is estimated to be about 55 years. It's less costly than the other remedies we looked at, and it's also a long-term remedy, once the

groundwater is remediated. It's a permanent remedy.

It will comply with applicable and relevant and appropriate requirements, and it utilizes permanent solutions.

Briefly, that's the presentation part. What I would like to do is go with questions and answers and address any concerns that you might have.

MS. SEPPI: If anybody has a question, give Charleen your name and spell your last name, because this is all going to be part of the permanent record. Yes.

MS. KOVACS: My same is Silvia Kovacs, K-O-V-A-C-S. I'm with the Warren County Environmental Commission, and with regards to ANC-C that's the third suspected site, you said that we could go into why you think there's a problem under there, can we go into that?

MR. CIPOT: Sure. Let me just get a few notes. We have a number of reasons. First and foremost, based on our historical data and a close couple to that are the RI findings. And it's going to be hard to see this, but we found a significant number of TCE hits on the

American National Can property.

We also found some perched layers of groundwater at the depth of 30 feet, which is above the aquifer. The aquifer here is about 100 feet. We found TCE's at the depth of -- at 30 feet we found it in the groundwater in the perched zone at 120 parts per billion, and that's right here.

At close -- pretty close by that location at 70 feet, which is still above, it's a perched zone, we found TCE at 170 parts per billion. And these are local perched aquifers. They don't extend for any great distance, unlike the regional, where you sink a well and you're going to hit the regional aquifer throughout valley.

These are just local lenses, silt and clay lenses where something from the surface has gotten into a well.

MS. KOVACS: These are pockets.

MR. CIPOT: Pockets. We also have, in addition, as I mentioned, a good percentage of hits of TCE throughout the American National Can. This is groundwater. Groundwater we have depths up to 403 feet. We

have TCE at 42 parts per billion. At 383 feet we have historical hits up to 200. The hot spot -- this is the American National Can facility here. Is this really hard to see?

The immediate highest part of the plume is here, the 500 part per billion contour of the plume comes up right in here and up in here, we have low levels in the teens, farther up gradient up around the Agway we have a bunch of nondetects.

So this is definitely the center of contamination. We also have some historical basically architectural engineering drawings that indicate that there were a number of different types of drains and floor drains throughout the facility in the '60's.

We think most of the contamination happened in the '50's through maybe the '70's. The operation has changed in nature substantially by the end of the '70's and '80's and went to PVC.

We sampled a number of surface water points where there was a number of drains coming from the ANC facility that are also, perhaps, linked to rain water drains with water

actually flowing out of the drain during the RI.

This one drain -- pipe, basically, was 10 parts per billion of TCE. It is still something we believe obviously was residual in the system in collection boxes or something. Somehow it's still picking up TCE. And at another location of drainage, same location, another hit of 20 parts per billion in water that was coming out after a rain event.

Different types of machines we believe might have been used were known to have used TCE at the time. Let's see, what else. Basically, also, to go back to the plume, here is the TCE plume.

Two things to note about the nature of the TCE plume versus the PCE plume. The PCE plume is decreasing in concentration substantially over time between the '70's when PCE was first detected above 100 parts per billion, 140 or so parts per billion, presently in the 40 or 50 or so part per billion range, which indicates that, for the most part, the source of PCE has greatly diminished.

There's not a lot feeding of the plume and the plume is diminishing, which is

what you would expect over time.

The TCE plume, which is the plume here on the screen, has been relatively constant through the whole period of time that we're talking about, from the '70's to the present and it really isn't changing very much. It might be moving, it might be leaching low levels downgradient, but something is maintaining the plume at a relatively steady state. It's almost what we would call a steady state plume, high concentrations are remaining and they're also remaining in the same area.

We have done some rough engineering estimates of the amount of total TCE in the plume, and we come up with what we think might -- should approximately still be leaching from the soils every year to sustain the plume and we help -- those figures helped us to determine that there's still something in place.

I could throw the numbers out, I don't know if it's going to mean anything. I get people confused every time I do that, but just roughly the total PCE plume might contain as much as 8,000 pounds of TCE, and in order to sustain a plume of that size, we estimate that

roughly it will take about 310 pounds of TCE per year to continue to be leaching every year into the groundwater in order to sustain a plume of that size, at roughly steady state.

Did that help? Did I lose anybody? Okay. Basically those are the main reasons. Yes.

MR. ZELLEY: Bob Zelley, Z-E-L-L-E-Y, a concerned resident of Warren County. You've been working on this project for several years, 15 years or so. We're just getting the synopsis tonight. I'm respectfully asking for an extension to the comment period, with only three weeks or so and many people really haven't had a chance to digest this and are on vacations.

I think over a 15-year -- month period, we need to have more than one month and actually look at this and have full discussions among ourselves.

MR. CIPOT: I'm not sure how we would do that.

MS. O'CONNELL: Are you requesting a specific extension, you said three weeks?

MR. ZELLEY: No, I'm saying -- a

couple months, at least.

MS. O'CONNELL: Okay. Is it possible -- okay. We will consider that and make a determination. We do often extend commentary requests for usually no more than 30 days.

MR. ZELLEY: I'm familiar with that.

MS. O'CONNELL: So we will, we will send an email out to everybody on the mailing list.

MR. CIPOT: We can do another notice in the paper.

MS. O'CONNELL: Yes, we could.

MR. ZELLEY: It would be a big difference on how we approach this with looking at this among these groups here.

The other comment is, the downgradient edge going into Greenwich Township, your solution -- is there an evaluation or concern that the plume in its present state has been taken care of, the source, but for a period, I don't know what the answer is, I haven't read the report yet, that you will continue to have downgrading migration of the

plume into Greenwich Township, which I understand has been negatively impacted in the pace setters development?

So with the (inaudible) wells establishing hydraulic control of a downward edge, you still have a continuation of the plume downgradient for some period, which is undetermined.

I mean, I don't know if you have an answer to that, but certainly the people in Greenwich and Franklin are probably quite concerned and wonder if that has been addressed, and will I read that in the report?

MR. CIPOT: That's not at all addressed in the Operable Number 1 part study. It's going to be addressed for our next phase of the study, Operable Unit 2. And at this point, and its entirely possible that the plume is leaching downgradient, but we don't know if the two areas are connected or not.

We have a large area where we don't -- between -- we have a large area where we don't have any data and then, of course, Greenwich is down here, and we have the Edison quarry area where we have the hits again and

then we have lower hits in Greenwich Township. It does appear that it is diminishing in that direction. There are a couple possible sources. There's a little Edison facility up here that could be a source where we had 8 parts per billion historically detected in there. There are a couple, not a lot, though, but there are a couple of operations along Route 57, and we're also going to be looking at the landfill, which did have releases in the past. It's up about in here, and it did have releases in the past.

It's also possible that these are lingering from a couple of different sources. We're not really sure yet until we start our study.

MR. ZELLEY: So the additional ground -- so you're saying that there will be a continual remedial investigation in that area of the plume?

MR. CIPOT: Right, yes.

MR. ZELLEY: Thanks.

MR. CIPOT: Okay. Yes, ma'am.

MS. ANDERSON: Barbara Anderson from Weichert Realtors. The remediation for the

phase you're considering now, is that contingent upon the private industry supporting that, getting the funds from them, or are you going ahead without funding?

MR. CIPOT: We don't have public money set aside to do this at this point. We're first going to approach the parties and try to get them to contribute for the remedy before we look for public money.

MR. CIPOT: Yes.

MR. BURKE: Michael Burke, B-U-R-K-E. I have a question regarding -- I assume the public supply wells are still being used?

MR. CIPOT: Yes.

MR. BURKE: If my math is correct, you're going to be removing water at roughly the same rate that they're removing water. Are you in the same aquifer?

MR. CIPOT: We're in the same aquifer.

MR. BURKE: Are you going to dry their wells out?

MR. CIPOT: No, we don't run into a real problem with the public water supply

wells unless we try to treat the entire plume, which we looked at, which was over -- in order to do that, I think it's over 12 million gallons per day of pumping. We also start to run into problems with dewatering surface streams and things like that, which is one of the reasons, besides costs, that we didn't look at much more pumping.

The pumping rate that we were working at, we should have no impact whatsoever on any of the public water supply. We did model -- we did a model to come up with the best compilation of the number of pumping wells and pumping rates. We looked at different rates, from the low and what we're looking at to treating the entire plume. And they're spelled out, two additional pumping scenarios that we looked at in detail are in the proposed plan. This is GW2. GW3 was expand pumping. And GW4 was the entire plume pumping.

If you look at the proposed plan, which was in the handout, if you wanted to see what the additional pumping rates were for those, it gives an idea.

This is Glen Carleton he's with

the USGS. I'm sorry I didn't see you back there. Glen is working on one of the models that we -- developing a model that's going to assist us with our groundwater part for Operable Unit 2. I'm sorry, Glen, I didn't know that you were there. What was the question?

MR. CARLETON: Because they're treating the water and then re-injecting it, it won't affect the public supply wells. They're just borrowing the water for a short time and then putting it back.

MR. CIPOT: Thank you. Yes, ma'am.

MS. CHAMBELLAN: I'm Nancy Chambellan, C-H-A-M-B-E-L-L-A-N. I'm with the Warren County Environmental Commission. I'm wondering what your thinking is in choosing the Groundwater Alternative 2 as opposed to 3 or 4, since that would take 55 years to reach goals and the third takes 47 and the GW4 would reach it in 22, particularly since this is an area that has been nationally designated as a critical water supply to the Highlands, that there are two in Warren County, and this underlies almost entirely Pohatcong?

I'm wondering the significance of the Highlands and U.S. Forestry's study recommendation for the care of this land and this water, for water supply why you would choose GW2 over 3 or 4?

MR. CIPOT: Well, to work backwards, as far as GW4, which was the entire plume treatment -- I'm going to switch slides here. We started to talk a little bit about some of the drawbacks for treating the entire plume, but the first one being it's a very, very large plume. It's a very large system that we would have to install.

You would have to withdraw about 13 million gallons per day. It would consist of six sets of five extraction wells. The current remedy is looking at three extraction wells for TCE. That's just for TCE.

In order to treat the entire PCE plume, also we're looking at a couple of additional wells. But 13 million gallons a day we started to have a significant impact on the surface water bodies, also in the Pohatcong Valley.

We're looking at potential

dewatering of the streams. We wouldn't pass some of the other ARAR criteria. We start damaging the ecological habitats. We have to back off because the stream is also a designated, as you say, stream and we wouldn't want to be negatively impacting that.

So actually -- and the cost, too, that one, and it's in the proposed plan, is $46,840,000, and as you noted, the time of the environmental restoration is 22 years, which basically is better than cutting the remedy in half, but it has these other drawbacks.

GW3 we also looked at. It's also a big system. We're looking at additional extraction wells, about two and a half or 2.6 million gallons per day for both the TCE and the PCE broken down, but the time of the environmental restoration, I think this is the main thing here, if you start looking at 47 years versus 55 years, you're not getting a lot of additional efficiency for all of the additional cost.

Our remedy is about 8 million dollars. Our GW2 versus 25,760,000 and we gain eight years in overall treatment, and the

primary reason for that being is that most of the contaminate in the plume is located within -- the mass of the contaminate is located within the 500 part per billion contour line.

So we looked at what is the most efficient way of getting at what we're calling the hot spots of contamination and the quickest amount of time looking at also costs. And the cost -- the cost went up about three times, but we only gained eight years of environmental restoration.

MS. O'CONNELL: I would just like to add that also we do modeling, so we can kind of predict how long a cleanup might take, which is a very inexact science. It's really just an estimate. Until you get out there and have a number of years of actual cleanup, it's hard to get actual numbers.

We develop those numbers, 47 years, 55 years, so we can -- as one of the elements so we can compare and contrast different alternatives, but you can't hang your hat on it. 47 years or 55 years might actually be the same thing. We're talking decades, that's what clear.

Whether it would actually be 32 years, it's not clear. It's really to look at for comparison purposes. So you can see that all the alternatives are going to be taking over a decade, and that's kind of what we're talking about to restore a plume of this size. I just wanted you to put that into perspective, so when we're comparing the years, you don't think, oh, in exactly 55 years we'll have a clean plume.

It's not exactly like that. It's just predicted, so we can use that as a tool for evaluating --

MS. CHAMBELLAN: You understand where I'm coming from, if the water in the Highlands for New York and New Jersey has been significantly above any other water, why weren't we treating it in a better way?

MS. O'CONNELL: We really do think that this is the best balance of alternatives. As he explained to you, we don't want to dewater the streams, we don't want to impact the public water supply. There's a lot of things to consider, and it's all relative, that's why we have all these different criteria to look at.

There's disruption to your town.

There's a huge disruption, much bigger disruption than building a smaller system. So we try to look at everything. I understand exactly what you're saying. We're looking at whole number of factors to consider, and that's how we came up with this alternative of this being the best balance, considering everything, but I note your comments.

MR. CIPOT: Yes, sir.

MR. SIPPLE: Greg Sipple, S-I-P-P-L-E. When you have the different alternatives, how much -- and you know where the sources are, how much does that impact when you negotiate with the private enterprise or private facility that contaminated?

Do you start at the highest one at 25 million dollars and say, you know, could we enforce this, but we're only going to enforce the 8 million dollar one? Is that contained into your calculations, or is there negotiations with the people that pollute while you're trying to clean this up?

MR. CIPOT: I know what you're question is, but we haven't started any negotiations yet with the company. The

company -- we wouldn't enter into negotiations of any sort until after we have selected a remedy. The nine criteria doesn't include negotiations with the company or considering what a company might think is the best or the cheapest type of a remedy. We really balance against those nine criteria that I showed you.

And some of the criteria, they really are very complicated and involved. We go through that process, and it's a very iterative and layered process, and we compare the remedies against each other as well, and that's how we come up with our selected remedy, and then we bring it to you at the same time, as we bring it to the company and we make it public.

We don't give anybody or a company preferential treatment whatsoever.

MR. SIPPLE: So the alternative that you selected was based on your expertise and professional and your hydrologist and engineers, and cost, like you said, is not a factor and that's based on your knowledge, that would be the best way to clean up this site?

MR. CIPOT: Right.

MR. SIPPLE: And you're not

worried about what somebody can pay for or negotiations or anything like that?

MR. CIPOT: Yes, sir.

MR. GARDNER: Rick Gardner, G-A-R-D-N-E-R. Sorry I didn't have a chance to peruse this too well yet, but I wanted to get back to the lady's comments on the cost factors.

What law does the EPA have? You establish a site of origin, but what laws on the books will basically help to leverage former companies to help shoulder the cost of this remediation?

MS. O'CONNELL: Well, the Superfund's law, it's a statute and we have enforcement responsibilities and we have enforcement powers given to us under the law. And so we have named three parties as potentially responsible parties, and we will pursue them to enter into enforcement negotiations to implement this remedy and give them an opportunity to sign onto that.

We have other authorities that if they don't agree to sign on, we have options that we can review. So the Superfund statute, the law, gives us legal authority and

responsibility to pursue the responsible parties as appropriate, and we have an attorney assigned to the site to assure we're complying with our law and we do -- we pursue enforcement to the folks down at the Superfund statute.

MR. GARDNER: Of course, they'll have their own set of attorneys --

MS. O'CONNELL: Yes.

MR. GARDNER: -- Who will argue and say we do not necessarily agree with the plan --

MS. O'CONNELL: Well, we would --

MR. GARDNER: -- or approach that you put forth.

MS. O'CONNELL: We would expect to offer and to receive comments during the public commentary period. The responsible parties are a member of the public, and they will likely present their comments to us during the public comment period and give their position on what we're planning and what they think, and that will be considered along with all the other public comments before we make a final decision.

So we would expect to hear from them most likely during the public comment.

MR. GARDNER: If the finances fall short, what is your plan B then?

MS. O'CONNELL: Well, the Superfund statute does provide funds for cleanups where responsible parties -- where there are no responsible parties or responsible parties will not or we are not in a position to order them to do the work, but there is a Superfund.

This project has been funded. So far the responsible parties were only identified during the remedial investigation. The parties were not identified earlier on. If they were identified earlier on, they would have been asked to do the study, but they were only identified during the study.

So they will be asked to participate in the cleanup. If that doesn't happen, for whatever reason, we have a fund which we use and we can pursue them later or we can order them to do it. We have a number of enforcement options, but there's a fund for sites that have no parties that would or could do the work.

MS. KOVACS: With regards to plan

B, with all due respect, Congress has not been forthcoming with the Superfund funding, so let's be realistic, okay, there really isn't that much in that fund that's available. So plan B, going to the taxpayers to have this funded really --

MS. O'CONNELL: There are funds and what we do, since the funds --

MS. KOVACS: Nothing like when Superfund first came into being. It was supposed to be -- companies were supposed to be putting in 10 percent every year and they have not; appropriations, they have not; Congress, Congress has not, so don't think that there's money there.

MS. O'CONNELL: Well, aside --

MS. KOVACS: The enforcement of having to actually go into negotiations is extraordinary important going after these companies.

MS. O'CONNELL: We agree. We always prefer to get private dollars to do the cleanup, as apposed to public dollars. Public dollars are limited. There are funds available. What happens to sites, there are sites, orphan sites who have no responsible parties that are

viable.

If there's not enough money to clean up all the sites, they get ranked, they can get put on a list. There will be money eventually, but not always immediately. And aside from the actual fund, which is the tax on the chemical industry which has expired, there is also funds appropriated from Congress.

So there are sites that are funded, but the funding is limited. There can be a few and, therefore, we always prefer to have projects privately funded wherever possible. It's often for the best all around.

MS. KOVACS: How does that deal with ranking on the NPL.

MS. O'CONNELL: The NPL ranking is done when the site rank doesn't change. The site will stay on the NPL --

MS. KOVACS: That's fine with regard to, okay, how do you actually prioritize whether or not --

MS. O'CONNELL: Oh, if the site is a funding site, not a private one, but a government funded site, they're usually ranked based on risk. There's a whole ranking process.

Because if we have 10 sites and only enough dollars this fiscal year to fund five of them, we want to fund the five sites that are causing the most potent health risk to humans. So they go through a whole ranking process to evaluate that on a site-by-site basis, and the sites will be ranked and the funding will be given to the sites who are presenting the worse public health problem first. And that ranking will happen again the next year and so on.

MR. ZELLEY: Bob Zelley, concerned citizen. The consultants for the potential responsible parties, have they reached out? Have they talked about signing them away? Are they familiar with projects like this where eventually, you know, the responsible party realizes they are responsible and they end up going MIA, at some point they just realize -- is that how -- anyone here representing these companies? Any consultant here representing them?

When you're on site, are there people there --

MR. CIPOT: Oh, yeah.

MR. ZELLEY: -- who they are using

as their consultant?

MR. CIPOT: Environ.

MS. O'CONNELL: The American Can facility, there are studies that are ongoing with the state authority and so the state has issued an order to that company to do some work, and they hired Environ and have been doing some work over the past, but as far as what we're doing, you know, we have notified the potential responsible parties.

We have had contact with their attorneys and discussed some items. We do expect -- we have not given them -- they received a copy of the proposed plan when it went public, just like everybody else. We do expect to receive written comments from them.

It's likely, it's up to them, but it's likely that we would receive written comments as to what their opinions are of the proposed plan. We will consider that, along with all the other public comments.

We will select a final remedy that's issued by the Agency, and then to get the final remedy implemented, we will -- we will send a draft consent decree to the responsible

parties saying we're inviting you into this process, we would like you to sign onto this, would you like to enter enforcement negotiations with us, and they will have a short window to respond to that.

And based on the response --

MR. ZELLEY: I understand how it works. I agree with some other comments, the best chance, the highest probability would be some very aggressive contact with the potential responsible party.

MS. O'CONNELL: Of course.

MR. ZELLEY: A lot has gone on. I have gone to these meetings before and read in the paper, U.S. Can has been in different discussions for many years now.

You have pretty high suspect of it. We live here, as they do, you know, we see -- they do live in the community and maybe us, as the people in the county, could help.

MS. O'CONNELL: Well, we're coming to the end of this phase where we're selecting a remedy. We funded the study, we completed our study, we're presenting the findings, we will make a decision. It's documented in the record

that decision.

Once that's done, we will immediately proceed to offer -- to get the parties in to try to get them to implement that. That's the first thing we will do. We won't look to fund it until -- until we've exhausted all legal authority.

MR. CIPOT: Yes, ma'am.

MS. ANDERSON: Barbara Anderson again. One question on the funding, if -- I just forgot my question. I completely forgot it.

MS. KOVACS: Kovacs again. With regards to the suite of the 136 tests that you did on VOC's, SVOC's and metal results, did you find anything else, are we looking at anything else?

MS. O'CONNELL: You mean besides the TCE?

MS. KOVACS: Right.

MR. CIPOT: We did -- at a number of other facilities we found, as we probably would expect, some metals at a number of different facilities. I would have -- we highlighted the results in the remedial

investigation. Some of the results were above cleanup levels for those constituents and contaminates.

We would not be going after them under the EPA program, because they did not contribute to the groundwater contamination for the original reason that the site was listed. They didn't contribute to the TCE and PCE plumes.

MS. KOVACS: That's a separate pollution problem not within this context?

MR. CIPOT: We referred it to the state, and we'll have to see how that will be followed up. But it falls, at present, outside the parameters of this.

MS. KOVACS: I see. Thank you.

MS. ANDERSON: Anderson. Question about how Superfund sites are ranked. If it's national, in terms of public impact, where would you put this one? If you were giving us an estimate now without being official?

MS. O'CONNELL: It's really hard to tell. It's also hard to tell what other sites are going to be evaluated at the same time and how much money there's going to be

available. If this was going to be a funded project, we would have to fill out, you know, a 15-page form and then there would be a national ranking board.

So it's really hard to predict that. We're hoping that this becomes an enforcement site and we don't have to deal with that. And if we did have to deal with that, you know, we would keep the public apprised of the status as this comes on.

We're not looking towards that direction. We're looking towards an enforcement solution.

UNIDENTIFIED PERSON: My concern in the future during this cleanup process, Warren County is in the process of having a lot of development pressure. How do developments reflect on the cleanup process? Would it hinder it or not because you're talking future sewage treatment plants, they're talking bringing more water into the borough in this area because they can't build wells.

MR. CIPOT: Is that for OU1 or OU2 or both?

UNIDENTIFIED PERSON: Either one,

if it is migrating, will it affect the cleanup process?

MS. O'CONNELL: All we can do -- all of the local development issues are really up to locals. All we can do is work with you throughout the process.

UNIDENTIFIED PERSON: Will future development be hindering the cleanup process or is that something that your models are going to show?

MS. O'CONNELL: Do you know what the actual physical --

MR. ROSENBERG: I think really what it gets at is, if there's large scale development projects that may require, you know, very large withdrawals of water, is it going to impact on where the extraction levels are, I think really the way that we need to do that is speak with the local communities and the decision-making bodies that define what these are.

And, as they come up, I think that they should contact the EPA and say, you know, this program is coming on the books, is this going to impact. And I think it's got to be

done on a case-by-case basis.

UNIDENTIFIED PERSON: Because most of the plume is within the Limestone Valley, which will more than likely continue to spread downgradient, so the development towards Pohatcong, Phillipsburg, that's going to have an effect on moving that plume farther towards --

MR. CIPOT: One thing that we'll be able to use as a tool is the groundwater model that's currently being developed, and it's a complicated model that will be able to allow us to have different inputs, say, from the development or additional withdrawals, and can be built into that.

So that, again, though, it would be based on dialogue, for us knowing what the plans are and for also the local community keeping us informed as to what's going on, especially large scale in nature.

UNIDENTIFIED PERSON: My question is, to follow that up, is there anything in regulations where our municipalities would need to contact you, or is this just an option?

MR. D'ANDREA: I'm with the Brownfields Program and that's the redevelopment

and Superfund, and I have touched base with Washington Borough. I live in Washington Borough, so I'm very concerned about this area. And I touched base with the administration of Washington Borough, and we're working very closely with them. So with the development plans that they have in place right now, we're going to set up meetings with the Superfund people that are here right now and see how both programs will be integrated together.

MR. CARLETON: Glen Carleton. If I can just comment a little bit. The groundwater flow model we're developing is -- it's very easy to plug any scenario you could want into it. So if you want to say this proposal for development, withdrawing a million gallons a day at this location, I can put that in.

If there's going to be 2,000 homes, each with individual wells, I can put that in. So we can test anything that you're interested in having tested with the model.

And a general comment that I wanted to make about the plume, there's different ways to envision it, but I'm going to

try and eight-lane super highway coming out of Washington Borough, and there's a ton of cars coming out, you know, every hour, constant stream of cars getting onto this eight-lane road. But then the cars are getting off at various exits, so farther down the road you go, the less traffic there is.

But it's the same number of cars coming in and the same number of cars going out, so the plume is not moving, it's like a conveyer belt, continuing entering and continuing exiting.

So if you imagine, the super highway at rush hour, there's this giant slug and it's moving downstream, and if you're in Greenwich Township, you're scared because it's coming towards you. But that's not occurring, you know, as we currently see it.

Now maybe with time we will come to a different understanding, but our current understanding is that the plume is not moving. There's water coming in and water going out, and the USGS did some age sampling where we tested the age of the water, and it appeared to me, as a groundwater hydrologist, surprisingly young.

If I was working in the New Jersey Pine Barrens in this situation, that water, in Greenwich Township, would be a thousand years old. Then I would think, oh, we're just seeing the leading edge and it's going to get worse, because the old water is contaminating the younger water is coming. But that doesn't seem to be the case.

It seems to be the young water that entered the aquifer long after the source of the contamination of land surface went away. So that's tells me that it's more likely, like I said, it's just this continuous conveyer belt.

The good news is that once they start treating the problem in the borough, or in the vicinity of the borough, the effects of that would be felt downstream relatively quickly, you know, years, not decades, you know.

The age of the water was in the ballpark of 10 years old, and there's a lot of problems that I'm not going to go into with contamination. New Jersey is a hard place to do this work.

You're out in the middle of nowhere, atmosphere concentrations are

well-known. In New Jersey you have got a lot of local sources of stuff, so it's a little harder.

But I think that you're going to see the result down the Valley relatively quickly once they start cutting off the source of the contamination. It's down in the ground. It's not at land surface anymore.

MR. ROSENBERG: Yes, sir, in the back.

MR. SIPPLE: Greg Sipple, Warren County Planning Department. Taking up what Cheryl said about the development, as you know, we have both the national and the state Highlands Act that came in here now. We have a regional plan in which that was supposed to be developed in this area within 18 months. Another year now has ticked by.

As we look out here to our north and Route 57, which is the Highlands Preservation boundary line between the boundary line and plain areas, from Route 57 south we look over across the mountain over here is other preservation area, it's like one large conveyer coming up here where all the growth is going to come into Warren County from surrounding areas.

Should the Highlands Council be contacting you to put this into the plan?

I was just down in Trenton all day yesterday. They are talking about capacity-based analysis or capacity-based resources for growth. The growth is coming here. Is there a concern for that not to come here now?

I mean, is the state mandating a regional plan for this area? The preservation area is going to be 88 acres or 25 acre density. This is going to have 8 units per acre density, and it's going to take the growth from there to here. And they're planning it right now, Commissioner Campbell, Highlands Council, Office of Smart Growth.

So when should these agencies come on board that's going to do a master plan that's going to be mandated for the preservation area and the towns are not pinned to it here for the present planning area?

MS. O'CONNELL: All I can tell you is we don't really deal with local development issues.

MR. SIPPLE: This is not local,

this is state.

MS. O'CONNELL: Even state. All we can do is tell you what we found and how we're planning to address it. And any way that we can assist you with any of the data we collected, all of those decisions are made on a state and local level.

The federal government is not going to come in to Warren County or Washington Township and tell you how to develop or how not to develop.

All we can do is give you all the information that we have so you can make the most informed decisions about whatever type of local development is going to be allowed here.

So, if there's any way that we can help you by giving you data, but we --

MR. SIPPLE: Does your Agency, your group, provide that and put numbers on there as -- as far as land use and development of that raw land so, you know, if you're going to put eight homes per acre and you're going to have, you know, 400 gallons per unit times 8, you know, 3200 gallons per day times how many houses, is that going to have an impact on this

area?

MR. D'ANDREA: Larry D'Andrea again. With the Brownfields Program, we've been working or having meetings with the commission and with Washington Borough, and we're going to set up a group that includes the Commission of DEP, EPA in Trenton and Washington Borough to look at development in the borough.

And I'm going to try and be as accurate as that to ensure and work with the Superfund people in determining what impacts development for Washington Borough is going to have with the Superfund and, again, to coordinate the efforts.

MR. SIPPLE: That's what I said, I spent eight hours yesterday with the office of Smart Growth, the DEP commissioner and the Highlands Council. And, again, they're talking about using national resources. I mean that was a mandate through the legislature, that based on water resources and pristine environment, we're going to have a growth accordingly.

But this area from 57 to the mountain over there in Pohatcong is a growth area, which is also in the Superfund site. So

when you do a capacity-based analysis, the water you're analyzing now is being brought out and all the wells are sealed. So the water is a public water supply.

So you have to find water sources above the contamination area or to bring the water into this. I would just like to have all that stuff be taken into consideration when the state is trying to mandate growth in our area, or isn't mandating growth in our area.

MR. D'ANDREA: Again, we are actively involved with the state on a number of different levels, and we meet regularly with DEP with DCA and Smart Growth and the commission.

MR. SIPPLE: I guess council would be the ones to do it. They're the ones mandated by the legislature to do the plan within 18 months. Adam Zeller or whoever hopefully this group or somebody would reach out to them and say this is the data that we have here or do I give them you're name to reach out to you?

MR. D'ANDREA: We had meetings already, do you want to comment on that?

MR. SHEOLA: I'm Richard Sheola, S-H-E-O-L-A. Just to follow up with what Larry

said, we had one meeting, we've got another one scheduled in the near future with Larry's group and Brownfields office from the State Smart Growth. We were very involved and very active with Smart Growth and office of Smart growth even before I joined the borough last September.

What Larry doesn't know is I was appointed to (inaudible) Highland Council and they're going to put me on at least one or two others. But there is a linkage between the borough and Highlands Council and the EPA, DEP and all the folks that we're talking about.

We're not living in a vacuum either. We're very cognizant what we need to do in the borough and especially the Brownfield site, and we're making a presentation to Brownfield just about a month from now.

MS. CHAMBELLAN: Nancy Chambellan again. The Highlands Council is a separate entity by law, and they do not answer to the commissioner, although they work together. So Deborah Pasquerelli, the Warren County appointee, she could not be here tonight because she has council business in Greenwich, so I know that she has a copy of this and the council is

very interested, since they are the ones charged with developing a regional massive plan. It will be essential to work with them. I agree with Greg on that.

And it doesn't just affect Washington Borough. As we see this area now covers seven municipalities potentially, so that's a tremendous amount of area, eight miles, and then whatever the OU2 is, and even if there is a 3 somewhere.

That's a tremendous amount of area that the council will need to be aware of to do proper planning if we really are going to protect what is supposed to be so valuable here.

UNIDENTIFIED PERSON: I agree with that, I fully agree. We have met with them already. We have met with them already and we are intending to continue that dialogue with them in the future, so we'll be coordinating efforts with them as well.

MS. SEPPI: Somebody in the back had a question. Sir.

MR. CARLETON: Glen Carleton, USGS. The U.S. geological survey is currently working with the Highlands Commission to do some

research in the Highlands, and if you want to discuss with EPA having the use -- having the use of the USGA Pohatcong model to answer some Highlands questions, we're already working with the Highlands Commission, so we would be happy to entertain any other requests.

And, of course, we defer to EPA, because it's the model that we built for their uses. But if we can be of help, we're happy to do so.

MR. GARDNER: I want to address your comments from earlier. You stated that once the remediation starts, there would be the quickest turnaround basically.

MR. CARLETON: Define quick? I'm a geologist. Millions of years is quick to me.

MR. GARDNER: You're going to see some effects in a short time, that's what you indicated.

MR. CARLETON: Again --

MR. GARDNER: The reason I'm asking, because there's different scenarios here. When we look at a time of restoration of 55 years, it seems like a very long time. That's three generations from us now, and I got

a sense from you, it won't take that long.

MR. CARLETON: I can't answer questions about the 55 years or the 47 years. And Kim made a very -- she made a very good point, which was that those numbers are from a model, that's approximate.

There's a lot of assumptions. The point I was trying to make is that my age sampling indicates the water is on the order of either 5 or 15 or so. When you begin you to see concentrations going down in the borough, I would suspect to see concentrations in about 10 years going down the Valley.

So I'm not saying it's going to be cleaned up and gone in 10 years. I'm saying it's going to begin to have an effect and, again, remember from my point of view as a ground monitoring hydrologist who doesn't live in a house down the Valley, I'm saying, wow, that's quick.

I'm not speaking about, you know, the homeowner who is looking at, you know, their 3-year-old child here. To them a year isn't quick.

MR. GARDNER: That's what I'm

concerned about, the public health aspect of it and concentration of TCE, and I guess it's the Dale Avenue and Vannatta Street water supplies that are affected by this. Are there any other water supplies that are impacted?

MR. CIPOT: No.

MS. KOVACS: Do we know in the OU2?

MR. CIPOT: Well, in the OU2 everybody is on residential wells.

MS. O'CONNELL: There's hits.

MR. CIPOT: Well, there are hits, yeah. Currently where there are hits above the one part billion groundwater quality criteria, the state number -- the state has been putting up portable treatment units on those residences.

I don't know if anybody is here tonight that is affected.

MS. TAMVINA: We are. And I have to say they're very efficient. I got a call today, they're due out quarterly to check our water. Donna Tamvina, T-A-M-V-I-N-A, Greenwich Township. They'll come next Friday. They come and change the tanks. Does that give me peace of mind? Not really. Do I drink the water?

No, but I haven't since I have moved here.

But another question, and I think you said it briefly, and I don't know the terminology you used, but I think our reading was like 2.4 and to everybody that's really low, and maybe it is, I don't know.

But then I spoke with somebody in the State of New Jersey who mentioned and you did, too, that I guess you were going to go out and evaluate basements or maybe how it is seeping up through the ground.

Now I got a whole another concern. I'm not drinking it, but now I'm inhaling it?

MR. CIPOT: That's -- that's -- that's another part of our Operable Unit 2 Study called the vapor intrusion part of the study. We didn't get to implement that in Operable Unit 1 because the whole concept or idea of vapor intrusion, which are basically contaminants in groundwater entering into a gaseous phase where previously they're dissolved in liquids in a plume becoming -- in a gaseous phase, because we are dealing with volatile organic compounds, and then what's the possibility of that seeping through the soil and reaching into breathing

space, whether it's a basement or a home or venting to the atmosphere, which is the least possible risk.

And that whole science is something that's really hit EPA at the tail end of when we were doing our Operable unit 1 study in 2003. It's been changing. The state has draft guidelines. New York has draft guidelines, and EPA has draft guidelines, and they've been constantly changing.

So we realize that we don't meet the state criteria, current criteria for what the state would consider there to be enough concentration in groundwater that should cause a vapor intrusion problem, but we're not sure of the sciences, so we decided the best way would be collect our data.

We tried taking some of our soil gas samples. We took 93 soil gas samples. We tried to look at that in a qualitative way to say, are we within a range of risk.

We also look at depth to groundwater, but we have the highest concentration in groundwater. You also have the greatest depth of 100 or greater feet and most

of our guidance says at that level you shouldn't have any problem whatsoever. But we're not sure.

The state guidance level for vapor intrusion is a concentration of 10 parts per million in groundwater. At 2,100 parts per billion, we're significantly below that, yet it's an inexact science.

What we're planning on doing in three areas, up in Washington Borough, up in Franklin Township, Washington Township water and then down in the Edison Quarry area, look at two, three houses where we would go into people's basement, and then drill through the basement floor and take air samples below the floors to see if there was any gas that's collecting under the basement, and then that would give us an idea if we're getting volatiles or compounds coming from the plume and that might be a problem and we would take it from there.

So those three areas we would be looking at and we would be contacting people in those three areas to see if anybody would be interested in allowing us to do that in their

homes.

MS. TAMVINA: My next question is, if in Washington their wells were capped and they're on public water, I know we're down, but why are we still on a well? So it's in our neighborhood. What's to say it's not going to go to another neighborhood in Greenwich? So, you know, how come we're still on a well and not public water?

MR. CIPOT: Well, that I don't really know.

MR. GARDNER: They were capped for a different reason.

MS. TAMVINA: It wasn't --

MR. GARDNER: They were capped because the landfill.

MR. ZELLEY: Bob Zelley. When did you move to Greenwich?

MS. TAMVINA: '98.

MR. ZELLEY: Okay. Well, we looked into putting the water line -- consumers, when they developed this 23 home development that's attached to your development, well we spoke to many people in your neighborhood about the water company was to extend the line and put

water supply throughout all the pace setters, and nine out of ten people said, no way, they didn't want to spend the money.

The water company was going to pay for a large portion, but they were going to need about $10,000 from homeowners over 10 years, for fire plugs, the water pressure and if the electricity goes off, you still have water. And just -- there was absolutely no support. The only person to support it was Mike Finalli.

MS. TAMVINA: We didn't get that memo, so I can say, I heard a rumor, but nothing ever came to the door.

MR. ZELLEY: If you could ever do that, I would take that offer.

MS. TAMVINA: At this point, I am sure everybody may reconsider that.

MS. KOVACS: Kovacs again. One of the things that you mentioned, Steve, was -- I need some units, eight thousand pounds of TCE and the source was 310 pounds per year?

MR. CIPOT: Right.

MS. KOVACS: Is that 310 pounds of soil going into the ground -- contaminated soil going into the groundwater? What do those

numbers mean?

MR. CIPOT: Volatile organic compounds. Contaminate of TCE, those numbers are rough engineering estimates, but there are approximately 1600 pounds of TCE A and B source areas and in those sources areas approximately, in order to sustain the plume at roughly to keep it viable concentrated plume, may be about 310 pounds, very roughly, would be leaching from those source areas every year.

MS. KOVACS: From that 1600 pounds, 310 pounds would be going in, so that you have a steady state in the groundwater.

MS. O'CONNELL: From the soil to the groundwater.

MR. CIPOT: Right. There are other unknowns, because obviously if we do that, you run out of your plume in six or so years, but that's -- because we're not seeing a diminishing plume, we also suspect that there's something going on that we haven't discovered.

We don't have an infinite number of borings on the ANC property or we also didn't look underneath the building. It is a very large facility.

MS. KOVACS: This is the C site.

MR. CIPOT: That's the C, the unknown section, and roughly the other number was maybe 8,0000 pounds of TCE in the plume currently, that's in the plume.

MS. KOVACS: Thank you.

MS. TAMVINA: Going back to OU2, how long will it be until you know where it's coming from, and I mean, I know it's a long way out. If you don't know where it's coming from, how do you clean it up? So what period of time are we looking at?

MR. CIPOT: For the study?

MS. TAMVINA: Well, to get here, to get to cleanup.

MR. CIPOT: Oh, my goodness, at least a couple of years, several years, yeah.

MS. TAMVINA: 20 years? 10 years?

MR. CIPOT: It shouldn't, but it also depends on our funding. We had to rachet down our investigation now because our funding is very limited. I have about half of the money that I was hoping to have right now, so we're looking at doing the most efficient use of the money and looking at the risks. So the vapor

intrusion part is one thing that we have kept in the study. So we have cut back on groundwater monitoring wells, so we're moving forward, but it's --

MS. O'CONNELL: I would just like to point out, it -- we're finishing up our work plan for the first part of the study. Sometimes after you collect a bunch of data, you may identify data gaps and need to go out and do another round of data.

We hope to be out in the field later this year and around early next year collecting data. And it may be a few years before we get to this point where we're ready to select a remedy. Now we have a mailing list, we can prepare periodic updates, and we can continue to provide the community with a status of what's going on before we get to the end, since we have an interested community, so maybe we'll get to the first -- end of the first phase of our fieldwork, and we can put out a facts sheet since we have an interested community, or you can contact Steve any time you want.

You have his email and phone number, if you want to know the status or you

want some information. And there's ways we can communicate with the community more frequently throughout the study so you know what's going on, you know what we've done and you know what we're planning next and you can kind of keep track of it as it moves along.

It's a long-term process. It's going to be a comprehensive study.

MR. CIPOT: One thing we have to identify people that would be interested in allowing us to go into their houses. You can start tonight. If anybody is interested in that possibility, letting us know on the list that you signed, maybe, it will save us time of sending out mass mailings, if we can quickly go and identify two or three houses where we know people are interested, instead of going through a long process.

MS. O'CONNELL: And, also, so you know, we -- say we did a soil vapor study and we took a core in your basement and somehow found levels, we don't necessarily have to wait. If there was something imposing immediate risk that we find in the study, we can use our removal program or we have ways that we can address that

short term to eliminate that risk while we're doing a long-term study, if it's something of a large --

MS. TAMVINA: We have radon already.

MR. CIPOT: That won't work.

MS. TAMVINA: I guess when the house was built it wasn't there, so when we bought it there was, you know, no detection. So then they had to connect that, they did that.

MS. O'CONNELL: It came back and it has some elevated levels? They're doing remediation of that?

MS. TAMVINA: Yes.

MR. CIPOT: It's very similar.

MS. TAMVINA: My house wouldn't necessarily help.

MS. O'CONNELL: It would also help if they're putting the ventilation in there, any vapors --

MS. TAMVINA: The state told me that would probably need remediation.

MS. O'CONNELL: The remediation, venting the basement, any kind of gasses or vapors or contamination you don't want

accumulating in the basement where you can come in contact. If your basement is properly vented, it will take care of anything.

MS. TAMVINA: What everybody wants it's peace of mind, and you sit here and it's absolutely beautiful and then that's why we moved here. And in the back of your head you're thinking but what, you know.

MS. O'CONNELL: I understand.

MR. CIPOT: It's everywhere.

MS. ANDERSON: Anderson. I'm curious, how much did this study cost to date to do?

MR. CIPOT: Let's see. We are a little over 12 million dollars to date.

Yes, sir, in the back.

MR. GREENWALT: Ron Greenwalt, G-R-E-N-W-A-L-T. A matter of curiosity, I notice that there was a gentleman here from Washington Borough. When we're -- were all the townships affected notified about this, because I didn't recognize --

MR. CIPOT: We had a pretty comprehensive notification. Pat mailed them out.

MR. GREENWALT: It seems strange that they're not here.

MS. SEPPI: I did have a couple people from all three towns that we did send them the proposed plans and notification about the meeting. I'm assuming that they got it.

MR. CIPOT: I know that members of the environmental commission had sent out a massive email and we also put the notice in the paper as well.

There was one article that was in the Express-Times notice. I don't know if other papers picked it up.

MR. GREENWALT: One other question then. With the way the development is going now and the OU2 area, I'm sure that the developers are salivating and wanting to build. When they start drilling their wells to put in a patch, by decreasing the pressure at the southern end, I'm no hydrologist, wouldn't that help the flow of this plume to go into the southwestern section?

MR. CIPOT: I think -- would you just repeat that.

MR. GREENWALT: The plume -- the more water they're extracting there, the more

the plume would migrate there?

MR. CIPOT: That's the groundwater gradient, that's where the plume is going.

MR. GREENWALT: With the decrease in pressure, it would go faster, would it not?

MR. CIPOT: You would need substantial decrease in pressure.

MR. GREENWALT: With that in mind, wouldn't it be a good idea to make a moratorium on building in that area until this project is underway?

MR. CIPOT: We really -- we don't get involved with local building codes and all that. It's not --

MR. GREENWALT: This has nothing to do with a code.

MR. CIPOT: I don't know how to answer the question.

MR. GREENWALT: Having the plume exacerbate itself and flow down at a faster rate.

MR. CARLETON: Again, we can test anything that you would like with the model, but I can tell you this, you know, I've been working with this model, and it becomes a living thing

and you would be amazed at how much water is flowing through the ground, and it would take a lot of houses to make a difference.

MR. GREENWALT: What's a lot, 200, 300?

MR. CARLETON: Oh, no, I don't want to put an exact number on it.

MR. GREENWALT: I'm not asking for an exact number, an approximation.

MR. CARLETON: But the Dale Avenue well is pumping 500 gallons a minute, when they're pumping, and then that's less than half a year, so 250 gallons a minute. Bear with me while I do some quick calculations here. That would be thousands of homes, the equivalent of thousands of homes, and it's -- that's up pretty close to the source, and I barely see it happening. I barely notice the effect.

So there's a lot of water flowing through the ground, and if those homes have septic systems, then you're putting that water back into the ground, and then you're having even less of it.

If 100 percent of the water came out of the well --

MR. GREENWALT: You're putting the water back from the septic system 100 foot above where your current water is.

MR. CARLETON: Not down Valley. At American National Can is 100 feet to water, but that's very unusual. Most places you're closer to the water table, particularly down closer to the river.

You know, if you get up on the sides, it could be even more. But all of the water in the aquifer is originally coming from nearby ground. Now, if you take water out on your property and put it back in the land surface on your property, it's not going to get back right down to the water table immediately.

But when you start talking thousands of homes over a large area, then the septic systems begin to help. They begin to put some -- not 100 percent, because if you water your grass, that evaporates, that's not going back in, et cetera.

But if you have septic systems, that helps. It tends to soften the effect.

MS. SEPPI: Yes, sir, in the blue shirt.

MR. ROSEBROCK: R-O-S-E-B-R-O-C-K, I'm with the environmental commission. I'm looking at page 10, GW3. Present worth of cost is $25,765,000. Is that spread over the 1.5 years or the 47 years?

MR. CIPOT: Actually, it's spread out over about 30 years. We cost things out for about 30 years.

MR. ROSEBROCK: So that's less than a million dollars a year over 30 years?

MS. O'CONNELL: Yes. Well, it's a million dollars a year for the estimated O&M costs to operate and maintain the system.

MR. ROSEBROCK: That's the O&M cost in addition to the present work, because I read the definition.

MR. CIPOT: It is included.

MR. ROSEBROCK: So the 25,760,000 is the present value of what it's going to cost over 30 years?

MS. O'CONNELL: Right. It won't be spread out evenly, though, because there would be construction costs.

MR. ROSEBROCK: If they borrow that money at the beginning and pay it back over

30 years and make even payments of like a mortgage?

MS. O'CONNELL: Yes.

MR. ROSEBROCK: Another question, how can we get copies of the transcript of this meeting? Can that be transmitted? Would we have to pay for it or how long would it take to get that?

MS. O'CONNELL: We have to double check, but I think we would receive a hard copy of the transcript somewhere about a three-week range from now. That's when we would get it. That's part of the public record.

We could certainly get a hard copy. We would have to get back to you. We can certainly get a hard copy as soon as it comes to us.

MR. ROSEBROCK: The State of New Jersey has a Damage to Natural Resources Program where they assess the polluters for the damage they've done. Have you done that, do you know what the damage is to this --

MS. O'CONNELL: That has not been done yet. That's not normally done --

MR. ROSEBROCK: Do you know how

much water is contaminated? I assume that in all the arithmetic that you have done, 300 pounds of TCE, blah, blah, blah, somewhere along the line someone had to figure out how much water there is altogether. I'm just curious. Is it a million gallons, a billion gallons, a gazillion gallons?

MR. ROSENBERG: We didn't look at that.

MR. ROSEBROCK: One last question, my understanding is, you know, we have a Limestone Act for water passes very rapidly from the surface to the aquifer and then horizontally along the ground.

I mean, we know that the plume has gone -- you said that contamination was actually done in the '50's and '60's, and the well, public wells were installed in 1989. That looks like, perhaps, there were 30 years of gap that people were drinking contaminated water, is that at least a correct assumption?

MR. CIPOT: Public wells were in operation at least in the '70's. That's when the public record shows that they became contaminated.

MR. ROSEBROCK: I mean, your model would it go backwards? Can you tell me where the plume is going to be? Can you go back to 1970 and 1975 and tell me whose well was contaminated?

MR. ROSENBERG: On one of these figures here there's data that goes back to the late 1970's from the department of health that took the original samples.

MR. ROSEBROCK: From what I'm hearing, there might have been contamination of people's wells a long time, like 20 years before the 1970's, am I wrong?

MR. ROSENBERG: We don't have that information.

MR. ROSEBROCK: Maybe you can model it using the information.

MR. CIPOT: Well, the model will have the ability to go back in time and make predictions and all. The public record shows the public wells were contaminated in '78. There's no record that we were shown that shows that it was there before, but it stands to reason it was somewhere in the aquifer before it hit the public well.

MR. ROSEBROCK: I'm just wondering if that would warrant any additional epidemiological study, people who lived in that region during that period of time?

MS. O'CONNELL: When was the township put on the public --

MR. ROSEBROCK: According to this, 1998 is when they extended the public water out into the township. I assume the borough was on public water and the township was on public wells.

MR. CIPOT: Yeah, it was done in phases. They put it in on phases, somehow correlated to impacted areas, but I don't know what the history was exactly. It's really not well reflected within our records, but we do know which houses were picked up. We do have those records.

MR. ROSEBROCK: Thank you.

MS. HAYED: Andrea Hayed, H-A-Y-E-D. I was hoping my township officials would be here, also. I was just wondering, has there been any study or survey or even questionnaires sent out, has anybody become ill? Are there any cancer clusters or things like

that or any studies been done or will there be or don't you know?

MR. NACE: The State of New Jersey, they collect cancer data through a cancer registry and they do evaluate and look at the cancer reports that they get and to see if they have any elevated rates in any particular area.

As far as I know, they do that on a regular basis, and I haven't heard or have not seen a report where they have identified any areas in this area as having what would typically be called a cancer cluster.

As far as I know, there haven't been any specific surveys or anything sent out to the residents. As the Superfund Program, we're concerned about people's health and -- but we, ourselves, don't do any of the epidemiological studies or send out the health surveys. That's something that the state board has to do.

MR. SIPPLE: Greg Sipple. I'm also a well driller in New Jersey. I know when we do have wells done, that there's various tests for each well when they're completed, a

well drillers law and the wells have to meet certain standards.

With the OU2 going farther, would, by public pressure to the groundwater resource and DEP asking that -- or are additional tests going to be given to the wells that are going to be -- new wells from this day forward to see if there is PCE's or TCE's in those wells as a requirement for a new well permit?

MR. CIPOT: I'm not totally sure I understand the question.

MR. SIPPLE: I guess now that we know that you're finding contaminations, and generally when a well is sampled, there's only like seven parameters to go on, would from either the public here or a request to DEP for water allocation ask that additional tests for the chemicals that you're finding now be given to the wells in the OU2 zone?

MS. O'CONNELL: That is a good question, and we'll have to forward -- we don't have a representative from the state here tonight, but we can forward that comment onto the state who regulates all of the drilling to see how that would be handled.

MR. SIPPLE: Okay.

MR. IVANY: Al Ivany, I-V-A-N-Y, Warren County Environmental Commissioner and also Washington Township resident. My first question is, does the EPA or the federal government mandate disclosure to home buyers that are coming to a site who are coming to Pohatcong Valley and are they federally mandated to notify Superfund site?

MR. CIPOT: I'm not aware of a federal law mandate, but there is a state law and there is a notification that has to be made that realtors have to comply with. That is a law, that is a requirement, but I'm not aware of anything federally, no.

MR. IVANY: Who is supposed to police their compliance?

MR. CIPOT: You had mentioned before back in March, and I have also heard from some homeowners that they weren't aware that there was a Superfund law and apparently it's not being implemented as consistently as it should be.

I don't know. I'll have to follow up with the state. I don't know how it is

implemented or what implications --

MR. IVANY: Do you feel that the homeowner would have legal recourse against the realtor for not being notified?

MS. O'CONNELL: You're going to have to consult with an attorney on that.

MR. IVANY: I just want to go on the record. My next question is regarding what Bill brought up about historical contamination. What about the workers at National Can, have precautions been taken over the years to assure the safety of the workers over at that facility?

Aside from this issue, this is an important industrial site for the community. If you're saying with the new site underneath the building there is extensive contamination, you believe, at high levels, I would assume there is the potential for invasion into that building, not to mention the fact it's in the drain system and not to mention the fact that community is ripe with stories from years past of people saying they're dumping barrels of contaminants over the river.

I don't know what has come forth at this time to tell you stories personally, but

they're out there. My concern would be also about past and present workers at National Can being subjected to horrific levels of contamination without knowing.

MS. O'CONNELL: I mean that facility is operating now. It operated in the past. Those kind of regulations were covered by OSHA, so they could follow up with OSHA to figure out if worker protection departments have or have not been met over time.

Also, it is also regulated by the RECRA program. Because it's an operating facility, it's out of our purview. If you know anybody that has information about past disposal of the facility, we would love to talk to them to get some information.

If they would be willing to talk to us, they should contact Steve directly, and I'll be happy to follow up on their information.

MR. IVANY: Did OSHA do contaminate sampling, will OSHA follow up?

MS. O'CONNELL: OSHA has regs. If they have workers handling certain chemicals, there's a slew of OSHA regs, but their regulations are developed to protect workers in

an exposure -- in a work exposure scenario. What we're looking at is protecting the residents, the drinking water, it's a different thing.

So I don't know exactly what they do, but, you know, you should go on the web site and contact them. They periodically inspect facilities. So the OSHA regs, are the regs that the company currently had to comply with in the past.

MS. SEPPI: Any more questions? If not, we thank you very much for coming tonight, for all your very good questions. And please don't forget the comment period goes until the 27th of this month.

If you think of anything else, send your comments into Steve, they'll all be part -- you know, the next thing you'll be seeing from us is our legal binding document which Steve said, which is called the record of decision, and that will set forth, you know, our final plan to clean up the site and, you know, that's why then all those comments that you make here tonight, and you may send into Steve, will all be addressed, too.

You'll see them in what's called a responsive summary. So you want to make sure if you talk to any of your friends and neighbors, give them copies of the proposed plan. Encourage them to send in their copies, also.

We really do rely heavy on comments before we reach any final decision.

Please don't hesitate to contact Steve or me or if you have any questions about the site, if we don't know the answer, we'll find them out for you. So, again, thank you very much for coming here.

(Concluded at 9:17 p.m.)

August 24

_____, 2005

I HEREBY CERTIFY that the proceedings are contained fully and accurately in the notes taken by me of the testimony of the within witness who was duly sworn by me, and that this is a correct transcript of the same.

Charleen A. Eyer, RPR

Charleen A. Eyer, RPR
Registered Professional Reporter

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WORD INDEX

A

ability 90:19
able 4:20,23 14:11 17:1 58:9,11
about 4:2,21 5:15,18 5:22 6:1,13,16 7:6 11:13,14,20 12:19 13:6 16:9 17:19 18:3 24:3,16,16,17 27:23 29:4 31:15 32:5 33:1 36:11 40:9,14 41:15,23 42:9 43:6 46:1 51:14 55:18 59:3,24 62:12 63:4 64:14 65:19 67:12,17 70:3 70:12,21 71:1 75:24 76:6 77:8 78:22 82:21 83:5 87:7,8 88:11 92:17 95:9,10 96:2,14 98:9
above 13:18 19:19,22 29:4,10 31:19 43:16 55:1 66:6 71:13 86:2
absolutely 76:9 82:6
acceptance 21:8,9 23:1
According 91:7
accordingly 65:22
accumulating 82:1
accurate 65:10
accurately 99:6
achieve 27:9,20
acre 63:11,12 64:22
acres 63:11
across 16:3 62:22
Act 62:14 89:12
action 13:21 15:6 21:17,17 22:2
active 67:4
actively 66:12
activities 14:12 18:12 22:18
actual 42:17,18 50:6 57:12
actually 9:13 12:20 23:12 31:1 33:19 41:7 42:23 43:1 49:17 50:20 87:6 89:16
Adam 66:18
add 42:13
added 8:10
addition 9:16 29:22 87:15
additional 18:15 36:17 38:17,23 40:21 41:14,21,22 58:13 91:2 93:5,17
address 4:15 20:7 28:8 64:4 69:11 80:25
addressed 35:12,15 35:16 97:25
adjacent 11:8 13:24
administration 59:4
advanced 24:15 27:13
advancing 24:12
affect 39:9 57:1 68:5
affected 71:4,18 82:21
after 4:13 5:12 17:7 22:8,21 25:21 27:2 31:9 45:2 49:18 55:4 61:10 79:8
again 12:7,21 13:23 16:5 19:17 22:2 25:24 27:3 35:25 51:10 54:10,13 58:15 65:3,13,18 66:11 67:19 69:20 70:17 76:18 84:22 98:11
against 45:7,12 95:3
age 60:23,24 61:19 70:8
agencies 63:17
agency 1:6 21:8 52:23 64:18
aggressive 53:10
agree 46:23 47:10 49:20 53:8 68:3,15 68:16
Agway 30:9
ahead 37:4
air 2:4,6 23:21 26:25 27:15 74:15
airflow 24:1
Al 3:17 94:2
Allentown 1:22,24
allocation 93:17
allow 25:4 58:11
allowed 64:15
allowing 74:25 80:11
almost 16:1 32:9 39:25
along 14:24 26:14 36:9 47:22 52:20 80:6 89:3,14
already 9:17 66:23 68:17,17 69:4 81:5
alternative 22:20,25 25:8,16,24 27:19 39:18 44:6 45:18
alternatives 4:2 21:14 22:2,23 25:25 42:22 43:4,19 44:12
although 67:21
altogether 89:5
Alvey 1:18 2:20,20
always 49:21 50:5,11
amazed 85:1
American 11:9 13:24 15:11,13 16:18 26:15 29:1,24 30:3 52:3 86:5
among 33:20 34:17
amount 32:14 42:8 68:8,11
amounts 19:1
analyses 15:5
analysis 10:10 63:5 66:1
analyzing 66:2
ANC 14:10 22:16 24:8 30:24 77:23
ANC-C 28:17
Anderson 36:24,24 54:9,9 55:17,17 82:11,11
Andrea 91:20
and/or 99:17
another 9:23 15:2 16:2 18:16 20:21 21:23 31:7,8 34:12 62:17 67:1 72:2,12 72:15 75:7 79:10 88:4
answer 5:10,11 18:10 23:15 34:23 35:10 67:20 69:3 70:2 84:18 98:10
answers 5:14 28:8
anybody 28:10 33:6 45:16 71:17 74:24 80:12 91:24 96:14
anymore 62:7
anyone 51:19
anything 4:13 11:4 12:1 13:18 19:21 26:9 32:21 46:2 54:16,16 58:21 59:21 82:3 84:23 92:15 94:15 97:16
anyway 3:25
apparently 94:21
appear 36:2
APPEARANCES 1:15
appeared 60:24
applicable 20:16 28:3
apply 99:16
appointed 67:8
appointee 67:23
apposed 49:22
appreciate 2:1 3:19 4:18 5:1
apprised 56:9
approach 34:16 37:7 47:13
appropriate 20:16 28:4 47:2
appropriated 50:8
appropriations 49:12
approximate 70:6
approximately 9:10 23:19 26:17,22 32:16 77:5,6
approximation 85:9
aquifer 10:3 27:2

29:4,4,15 37:19,21 61:10 86:11 89:13 90:24
aquifers 29:12
ARAR 20:21,24 41:2
ARAR's 20:17,25 21:1,1
architectural 30:13
area 1:2 6:4,10,14 7:11 8:3,9 9:6,11 11:12 12:11 13:15 14:8 15:7,7,10,15 15:15,17,20,20,24 18:1,3,5,7,11 24:3,8 24:19,24 26:7,15 32:12 35:21,22,25 36:19 39:21 56:21 59:3 62:16,23 63:10 63:11,19,21 65:1,23 65:25 66:6,9,10 68:6,8,11 74:12 83:16 84:10 86:17 92:8,12
areas 14:4 15:15 18:19 19:16,22 20:10 22:13 23:9,11 23:17 25:21,21 26:21 27:12 35:20 62:21,25 74:10,22 74:24 77:6,6,10 91:14 92:12
argue 47:9
arithmetic 89:2
around 24:8 26:15 30:9 50:13 79:12
article 83:11
aside 37:6 49:15 50:6 95:13
asked 48:15,17
asking 33:13 69:22 85:8 93:5
aspect 71:1
assess 88:20
assessment 2:25 19:4
assigned 47:2
assist 39:4 64:5
assume 37:13 89:1 91:9 95:17
assuming 83:6
assumption 89:21
assumptions 70:7
assure 47:3 95:11
atmosphere 61:25 73:2
attached 75:23
attention 15:4
attenuation 22:3,5 27:7
attorney 47:2 95:6
attorneys 47:7 52:12
augers 24:19
August 1:11 4:11
authorities 46:22
authority 46:25 52:5 54:7
available 7:25 49:4 49:23 56:1
Avenue 7:5 71:3 85:10
aware 68:12 94:10,14 94:20
away 51:14 61:11

B

B 14:6 15:15 48:2 49:1,4 77:5
back 10:18 16:8 18:9 27:1,17 31:13 39:1 39:11 41:4 46:7 62:9 68:21 78:7 79:2 81:11 82:7,16 85:22 86:2,13,15,21 87:25 88:15 90:3,7 90:19 94:19
background 7:25
backhoes 24:19
backwards 40:7 90:2
bad 2:3
balance 23:4 26:2 43:19 44:7 45:6
ballpark 61:20
Barbara 36:24 54:9
barely 85:17,18
barrels 95:22
Barrens 61:2
base 59:1,4
based 8:22 14:10,16 15:15 16:12,15 17:8 24:9 28:22 45:19,22 50:25 53:6 58:16 65:20
basement 73:1 74:14 74:15,17 80:21 81:24 82:1,2
basements 72:10
basically 6:22 10:22 13:21 21:24 24:11 24:21 27:11 30:13 31:2,13 33:6 41:11 46:10 69:14 72:19
basis 51:6 58:1 92:10
bean 12:4,4
Bear 85:13
beautiful 82:6
became 89:24
become 91:24
becomes 56:6 84:25
becoming 72:22
before 3:4 21:11 37:8 47:23 53:14 67:6 79:14,18 90:12,23 90:24 94:19 98:7
began 7:24
begin 70:10,16 86:18 86:18
beginning 87:25
behind 13:7
being 2:2,3 4:25 8:7 37:13 40:11 42:1 44:7 49:9 55:21 58:10 66:2 94:22 95:4 96:3
believe 14:8 16:13 23:3 25:8,10 26:1 31:4,11 95:17
below 6:14 13:6 14:20 24:1 25:14 74:7,15
belt 60:11 61:13
besides 38:7 54:18
best 23:4 26:2 38:12 43:19 44:7 45:5,23 50:13 53:9 73:16
better 41:11 43:17
between 8:11 31:18 35:22 62:20 67:10
big 34:15 41:14
bigger 44:1
Bill 95:9
billion 11:4 12:14,17 12:23,24 13:14 19:2 20:18 26:8,10 27:4 27:10 29:7,12 30:1 30:6 31:3,8,20,20 31:21 36:6 42:4 71:14 74:7 89:6
binding 97:19
bit 5:18 6:2,16,17 10:19 40:9 59:12
blah 89:3,3,3
blowup 12:10
blue 86:24
board 18:13 56:4 63:18 92:20
boards 18:8,24
Bob 33:8 51:11 75:17
bodies 40:23 57:20
books 46:10 57:24
boring 13:9
borings 9:18 24:12 24:14,22 77:23
borough 6:10 11:16 11:24 12:8,20 15:13 15:24 56:21 59:2,3 59:5 60:2 61:15,16 65:5,7,8,12 67:6,11 67:15 68:6 70:11 74:10 82:20 91:9
borrow 87:24
borrowing 39:10
both 7:1,1 11:3 16:23 18:18 20:5 22:14 41:16 56:24 59:9 62:13
bottom 13:3
bought 81:9
boundary 6:9 12:8 18:2 62:20,20
boxes 15:4 31:5
break 23:20
breathing 72:25
brief 6:22 10:14

briefly 17:18 28:6 72:3
bring 10:17 17:6 45:14,14 66:6
bringing 56:20
broken 6:15 41:17
brought 66:2 95:9
Brownfield 67:15,17
Brownfields 58:25 65:3 67:3
build 56:22 83:17
building 14:10 23:14 24:9 44:2 77:24 84:10,13 95:16,18
built 58:14 69:8 81:8
bunch 30:9 79:8
Burke 37:11,11,16,22
Burkett 3:18
business 11:23 67:24
buyers 94:6
B-U-R-K-E 37:12

C

C 15:20 78:1,2
calculations 14:16 44:20 85:14
call 4:14 6:3,7 8:3,24 20:12 27:5 32:10 71:20
called 11:18 21:20 23:6,25 24:20 27:6 72:16 92:13 97:20 98:1
calling 22:21 42:6
came 44:6 49:9 62:14 76:13 81:11 85:24
Campbell 63:15
cancer 91:25 92:4,5,6 92:13
capacity-based 63:5 63:5 66:1
capped 75:3,12,15
capping 21:19
capture 22:6
carcinogenic 19:9
carcinogens 19:11
care 34:22 40:3 82:3
Carleton 38:25 39:7 59:11,11 68:23,23 69:15,20 70:2 84:22 85:6,10 86:4
cars 60:2,4,5,8,9
case 17:2 61:8
case-by-case 58:1
cause 73:14
causing 51:3
center 1:23 30:11
certain 93:2 96:23
certainly 4:14 35:10 88:14,16
certification 99:16
CERTIFY 99:5
certifying 99:18
cetera 86:21
Chambellan 39:14,15 43:13 67:18,18
chance 33:15 46:5 53:9
change 50:17 71:24
changed 30:19
changing 32:6 73:7 73:10
characterized 23:18
charged 68:1
Charleen 1:12 3:6 4:12 28:11 99:12
cheapest 45:6
check 71:21 88:10
chemical 14:17 50:7
chemicals 93:18 96:23
Cheryl 3:18 62:12
child 70:23
chlorinated 6:24 8:5 8:19
choose 40:5
choosing 39:17
chosen 4:3
Chuck 1:19 2:23
CH2M 1:16 3:2
Cipot 1:17 2:14,15 5:20 16:11 28:20 29:21 33:21 34:12 35:14 36:21,23 37:5 37:10,15,20,24 39:12 40:6 44:9,23 45:24 46:3 51:24 52:2 54:8,21 55:12 56:23 58:8 71:6,9 71:12 72:14 75:10 76:22 77:2,16 78:2 78:13,16,19 80:9 81:6,15 82:10,14,23 83:7,22 84:2,6,12 84:17 87:6,17 89:22 90:18 91:12 93:10 94:10,18
citizen 51:12
City 2:9
clarifying 27:15
clay 29:18
clean 4:3 43:9 44:22 45:23 50:3 78:11 97:22
cleaned 25:22 70:15
cleaners 11:17 16:22
cleanup 13:19,20 14:22 17:16 19:19 19:19 20:5,10,19,23 25:15 27:2 42:14,17 48:18 49:22 55:2 56:15,18 57:1,8 78:15
cleanups 48:5
clear 42:25 43:2
close 13:15 16:2 26:20 28:23 29:9,9 85:17
closely 59:6
closer 15:3 25:1 86:7 86:8
cluster 92:13
clusters 91:25
code 84:16
codes 84:13
cognizant 67:14
collect 13:10 22:11 73:17 79:8 92:4
collected 9:20,21,22 13:5 64:6
collecting 74:17 79:13
collection 31:5
colored 12:12
column 24:4
combination 8:23
come 18:4 21:11 32:15 38:12 45:13 57:22 60:19 62:25 63:7,17 64:9 71:23 71:23 75:8 82:1 95:24
comes 30:7 56:10 88:16
coming 2:2 6:12 30:24 31:9 43:14 53:21 57:24 60:1,3 60:9,17,22 61:7 62:24 63:6 74:19 78:9,10 86:11 94:7 94:7 97:12 98:12
commencing 1:11
comment 4:9 17:7,9 33:13 34:18 47:20 47:25 59:12,23 66:23 93:23 97:14
commentary 34:5 47:17
comments 3:12 4:5 4:11 5:1 44:8 46:7 47:16,19,23 52:16 52:19,21 53:8 69:12 97:17,23 98:7
Commerce 1:23
commission 3:17 28:16 39:16 65:4,6 66:14 68:25 69:5 83:8 87:2
commissioner 63:15 65:17 67:21 94:3
communicate 80:2
communities 57:19
community 2:8 21:9 23:1 53:19 58:17 79:17,19,22 80:2 95:14,20
companies 7:8 16:12 17:13,17 46:11 49:10,19 51:20
company 44:25 45:1 45:4,5,15,16 52:6 75:25 76:4 97:9

compare 42:21 45:11
compared 20:10,12 22:23 25:25
comparing 43:8
comparison 43:3
compilation 38:13
completed 53:23 92:25
completely 54:11
compliance 20:15 94:17
complicated 45:9 58:11
comply 28:3 94:13 97:9
complying 47:3
compounds 6:25 10:12,12 11:3 72:23 74:19 77:3
comprehensive 4:23 9:9 80:8 82:24
concentrated 11:16 77:8
concentration 12:1,3 12:15 15:17 26:9 31:17 71:2 73:14,24 74:5
concentrations 11:6 11:15 12:5 14:2,17 14:19 15:9,16 16:6 18:21 19:18 32:11 61:25 70:11,12
concept 72:18
concern 34:21 56:14 63:7 72:12 96:1
concerned 33:9 35:12 51:11 59:3 71:1 92:17
concerns 28:8
Concluded 98:13
conditioned 2:4
conditioner 2:6
conduct 7:16 18:16 22:17
conducted 8:7,12 19:3 20:3
confused 32:22
Congress 49:1,12,13 50:8
connect 81:10
connected 35:20
consent 52:25
consider 21:11 34:3 43:23 44:5 52:20 73:13
consideration 66:8
considered 19:12 47:22
considering 37:1 44:7 45:4
consist 40:15
consistently 94:22
consists 26:4
constant 32:3 60:3
constantly 73:10
constituents 55:2
construction 87:23
consult 95:6
consultant 51:20 52:1
consultants 51:12
consumers 75:21
contact 19:6 25:12 52:11 53:10 57:23 58:23 79:23 82:2 96:18 97:7 98:8
contacting 63:1 74:23
contain 32:23
contained 19:15 44:19 99:6
contaminants 72:19 95:22
contaminate 20:20 42:2,3 77:3 96:21
contaminated 4:3,4 6:21 25:12,13,14 26:5 44:15 76:24 89:1,20,25 90:5,21
contaminates 8:6 21:5 25:9 55:3
contaminating 61:6
contamination 1:2 7:18 8:19 14:14 15:21 16:15,18 20:6 24:7 30:12,17 42:7 55:6 61:11,22 62:6 66:6 81:25 89:16 90:11 95:9,16 96:4
contaminations 93:13
context 55:11
contingent 37:1
continual 36:19
continuation 35:6
continue 7:16 33:2 34:25 58:4 68:18 79:17
continued 7:12 17:25
continuing 60:11,11
continuous 61:13
contour 12:12,13,22 13:3 30:6 42:4
contours 12:1
contractor 3:3 10:18 18:13
contrast 42:21
contribute 37:8 55:6 55:8
contributed 8:16
contributing 8:15 15:21
contributor 16:25
control 35:5 99:17
controls 21:20 25:18
conveyer 60:10 61:13 62:23
coordinate 65:14
coordinating 22:18 68:19
coordinator 2:8
copies 88:5 98:4,5
copy 4:17 15:2 52:14 67:25 88:10,15,16
core 80:21
Corporate 1:23
correct 37:16 89:21 99:9
correlated 91:14
cost 41:7,22 42:9,9 45:21 46:7,11 82:12 87:3,7,15,19
costing 22:13
costly 27:24
costs 21:7 38:7 42:8 87:13,23
council 63:1,15 65:18 66:15 67:8,11,19,24 67:25 68:12
county 1:3,9 3:17 7:14 8:1 28:15 33:10 39:16,24 53:20 56:16 62:11 62:25 64:9 67:22 94:3
couple 3:15,21 5:2 28:23 34:1 36:4,7,8 36:14 40:20 78:17 83:3
course 35:23 47:6 53:12 69:7
Court 1:23
covered 96:7
covers 9:11 68:7
criteria 13:19,20 20:12,13,14 21:10 22:24 23:2,4 26:1,2 41:2 43:24 45:3,7,8 71:14 73:12,12
critical 39:23
curiosity 82:18
curious 82:12 89:5
current 40:16 60:20 73:12 86:3
currently 19:22 58:10 60:18 68:24 71:13 78:5 97:9
cut 79:2
cutting 41:11 62:5
C-H-A-M-B-E-L-L... 39:15

D

Dale 7:5 71:3 85:10
damage 88:19,20,22
damaging 41:3
data 8:9 18:24 28:22 35:23 64:5,17 66:20 73:17 79:8,9,10,13 90:7 92:4
date 82:12,15
day 26:24 38:4 40:15 40:21 41:16 59:17 63:3 64:24 93:7

days 34:6
DCA 66:14
deal 50:14 56:7,8 63:23
dealing 72:23
Deborah 67:22
decade 43:5
decades 42:24 61:18
decided 73:16
decision 17:10 47:23 53:25 54:1 97:21 98:7
decisions 64:6,14
decision-making 57:20
decrease 84:4,7
decreasing 31:17 83:19
decree 52:25
deeds 25:19
deeper 23:24
defer 69:7
define 7:17 57:20 69:15
defined 7:10
defines 12:25
definitely 30:11
definition 87:16
delineate 22:12
density 63:11,12
DEP 8:2 14:21 22:18 65:7,17 66:13 67:11 93:5,16
department 7:8,9,14 7:15 8:1 11:1 17:24 62:11 90:8
departments 96:9
depends 78:20
depth 23:18 24:2,3,6 24:13,16 29:3,5 73:22,25
depths 29:25
design 22:9,10,11
designated 39:22 41:5
detail 8:5,21 9:7 19:25 21:16 22:23 38:18
detailed 22:9,11
details 6:23
detected 7:4 14:19 15:16 31:19 36:7
detection 81:9
detections 11:14,22
detects 18:25
determination 34:4
determine 8:15,18 32:19
determining 65:11
develop 4:19 42:19 64:10,11
developed 8:2 22:21 58:10 62:16 75:22 96:25
developers 83:16
developing 39:3 59:13 68:2
development 35:3 56:17 57:4,8,15 58:5,13 59:6,16 62:12 63:23 64:15 64:20 65:8,12 75:22 75:23 83:15
developments 56:17
dewater 43:20
dewatering 38:5 41:1
dialogue 58:16 68:18
difference 34:16 85:3
different 10:3 21:13 25:2,3 30:15 31:10 36:14 38:14 42:22 43:24 44:11 53:15 54:24 58:12 59:25 60:20 66:13 69:22 75:13 97:3
digest 33:15
diminished 31:23
diminishing 31:25 36:3 77:20
direct 19:6 25:11 99:17
direction 14:14 36:3 56:12
directly 96:18
disclosure 94:6
discovered 77:21
discuss 10:18 17:21 19:25 69:2
discussed 52:12
discussions 33:19 53:16
disposal 21:25 96:14
disruption 43:25 44:1,2
dissolved 72:21
distance 29:13
district 11:23
divided 17:20
document 97:19
documented 53:25
documents 17:10,10
doing 52:7,9 73:6 74:9 78:24 81:2,12
dollar 44:19
dollars 41:24 44:17 49:21,22,23 51:2 82:15 87:10,12
domestic 10:1
done 17:16 32:13 50:17 54:2 58:1 80:4 88:21,21,24,24 89:2,17 91:12 92:1 92:24
Donna 71:22
door 76:13
double 88:9
down 3:11 6:12 8:14 15:24 16:24 18:3 24:2,13,15,23 35:24 41:17 47:5 60:6 62:4,6 63:3 70:11 70:13,19 74:12 75:4 78:21 84:20 86:4,7 86:15
downgradient 6:3 11:8 12:17 18:1 26:14,21 27:5,8 32:8 34:19 35:7,19 58:5
downgrading 34:25
downstream 60:15 61:17
downward 35:5
DPE 23:10 24:11,14
draft 52:25 73:8,8,9
drain 31:1,2 95:19
drainage 31:7
drains 30:15,15,23,25
draw 15:4
drawbacks 40:10 41:12
drawings 30:13
drill 13:10 74:14
drilled 9:18,19
driller 92:23
drillers 93:1
drilling 24:12 83:18 93:24
drink 71:25
drinking 19:7 72:13 89:20 97:3
dry 11:17 37:22
dual 21:21 23:6,21
due 19:11 49:1 71:21
duly 99:8
dumping 95:22
during 8:20,21 9:3,7 31:1 47:16,19,25 48:12,16 56:15 91:4
D'Andrea 58:24 65:2 65:2 66:11,22

E

each 20:11 22:23 25:25 45:12 59:20 92:25
earlier 48:13,14 69:12
early 7:21 17:23 79:12
easy 59:14
ecological 19:4,23 21:1 41:3
Econowash 11:19 13:1 14:23 15:25 16:22
edge 26:14 34:19 35:6 61:5
Edison 35:24 36:5 74:12
effect 58:7 70:16 85:18 86:23

effectiveness 21:2,6 26:3
effects 19:9 61:16 69:18
efficiency 41:21
efficient 42:6 71:20 78:24
effort 18:17
efforts 65:14 68:20
eight 9:10 41:25 42:10 64:22 65:16 68:8 76:20
eight-lane 60:1,4
either 14:9 56:25 67:14 70:10 93:16
electricity 76:8
elements 42:21
elevated 81:12 92:7
eliminate 25:17,19 81:1
email 4:14,15 34:10 79:24 83:9
Encourage 98:5
end 3:9 4:10 5:6 30:20 51:17 53:22 73:5 79:18,20 83:19
ended 9:4
enforce 44:18,18
enforcement 16:9 17:3 46:15,16,19 47:4 48:22 49:16 53:3 56:7,12
engineering 22:13 30:13 32:14 77:4
engineers 45:21
enough 50:2 51:1 73:13
ensure 65:10
enter 17:13 25:5 45:1 46:19 53:3
entered 61:10
entering 60:11 72:20
enterprise 44:14
entertain 69:6
entire 22:6,7 38:1,16 38:20 40:7,10,19
entirely 35:18 39:25
entity 67:20
Environ 52:2,7
environment 20:15 27:22 65:21
environmental 1:6 3:17 7:8,10,16 11:2 17:25 28:16 39:16 41:10,18 42:10 83:8 87:2 94:3
envision 59:25
EPA 1:17,17,18,18 1:19 2:8,15,19 3:3 4:2 7:21,24 8:2,8,12 8:20 17:20 19:10 20:3 46:8 55:5 57:23 65:7 67:11 69:2,7 73:5,9 94:5
epidemiological 91:3 92:19
equal 12:2
equivalent 85:15
erosion 25:13
ERSA 1:22
especially 2:2 58:19 67:15
essential 68:3
establish 46:9
establishing 35:5
estimate 26:13 32:25 42:16 55:21
estimated 27:23 87:12
estimates 32:14 77:4
et 86:21
etheme 6:25
evaluate 18:20 20:4 21:11 51:5 72:10 92:5
evaluated 8:4 22:22 55:24
evaluating 43:12
evaluation 34:20
evaporates 86:20
even 10:8 64:2 67:6 68:9 85:23 86:10 88:1 91:23
evening 2:11
evenly 87:22
event 31:9
events 14:5
eventually 50:5 51:16
ever 76:13,14
every 32:17,22 33:2 49:11 60:3 77:10
everybody 5:21 22:10 34:10 52:15 71:10 72:5 76:17 82:4
everyone 5:21
everything 44:3,7
everywhere 82:10
exacerbate 84:20
exact 85:7,9
exactly 43:9,10 44:4 91:15 97:5
example 20:17
examples 20:24
excavate 24:5
excavation 21:22,24 23:8
exceeded 14:2 15:5
excuse 7:1
exhausted 54:6
existing 11:17 14:10
exiting 60:12
exits 60:6
expand 38:19
expanded 22:4
expect 32:1 47:15,24 52:13,16 54:23
expectation 12:13
expected 27:20
expending 17:14
expertise 45:19
expired 50:7
explained 43:20
exposure 19:5 20:7 97:1,1
Express-Times 83:12
extend 7:12 29:13 34:4 75:25
extended 91:8
extends 11:12
extension 33:13,24
extensive 95:16
extent 7:17 8:18 24:7
extracting 25:2 26:4 26:17,22 83:25
extraction 21:21 23:7 23:22 24:20 26:13 26:19 27:13 40:16 40:17 41:15 57:17
extraordinary 49:18
Eyer 1:12 99:12

F

facilities 8:4,10,21 9:5,6,12,12 14:22 15:23,24 16:5,16 54:22,24 97:8
facility 11:9 13:7,24 13:24,25 14:23 15:11,14 16:4,19,24 26:16 30:4,16,24 36:5 44:15 52:4 77:25 95:12 96:6,13 96:15
fact 95:19,20
factor 45:22
factors 44:5 46:7
facts 79:21
fall 48:1
falls 55:14
familiar 34:7 51:15
far 17:2 40:7 48:11 52:8 64:20 92:9,14
farther 30:8 58:7 60:6 93:3
faster 84:5,20
feasibility 1:5 7:22 16:10 20:1,3
federal 64:8 94:5,11
federally 94:8,15
feeding 31:24
feel 5:15 13:14 95:2
feet 9:19 11:14,21 13:6 23:19 24:1,3 24:16,17 29:3,5,6 29:10,25 30:1 73:25 86:5
felt 61:17
few 28:21 50:11 79:13
field 9:2,4,13 79:11
fieldwork 8:12,22 79:21

figure 14:7 89:4 96:9
figures 32:18 90:7
fill 56:2
final 9:3 47:23 52:22 52:24 97:22 98:7
Finalli 76:10
finally 22:5
finances 48:1
find 17:1 19:21 54:16 66:5 80:24 98:11
finding 93:13,18
findings 10:19,21 13:17 16:12 28:23 53:24
fine 50:19
finishing 79:6
fire 76:7
first 1:24 3:14 13:17 16:17 17:22 21:16 28:22 31:19 37:7 40:11 49:9 51:9 54:5 79:7,20,20 94:4
fiscal 51:2
five 11:13 40:16 51:2 51:3
flip 18:9
floor 1:24 30:15 74:15
floors 74:16
flow 23:21 59:13 83:20 84:20
flowing 31:1 85:2,19
flows 14:15
focused 15:6
folks 47:5 67:12
follow 58:21 66:25 94:24 96:8,19,21
followed 55:14
foot 86:2
foregoing 99:16
foremost 28:22
Forestry's 40:2
forget 97:14
forgot 54:11,11
form 56:3
former 11:9 13:23 15:13 16:18 26:15 46:10
forth 47:14 95:24 97:21
forthcoming 49:2
forward 79:3 93:7,21 93:23
found 2:5 11:7 12:6 12:16 13:18 18:21 19:18,23 28:25 29:2 29:5,6,11 54:22 64:3 80:21
four 21:15,16 22:1,22 26:23
fractured 23:25
fracturing 23:25
frame 27:23
Franklin 35:11 74:11
frequently 80:2
Friday 71:23
friends 98:3
from 3:16,21 7:25 8:1 9:21,23,24 10:4 11:17 13:5 14:5,11 15:8 18:22 19:1 24:1 25:11 29:18 30:24 32:5,17 36:14 36:25 37:3 38:15 43:14 47:24 50:6,8 52:16 58:12 62:21 62:25 63:13 65:23 67:3,17 69:12,25 70:1,5,17 74:19,20 76:6 77:9,11,14 78:9,10 82:19 83:4 86:2,11 88:12 89:12 90:8,10 93:7,15,22 94:19 95:13,21 97:19
full 10:10 11:12 33:19
fully 22:12 68:16 99:6
fund 48:19,22 49:4 50:6 51:2,3 54:6
funded 48:10 49:5 50:10,12,24 53:23 56:1
funding 37:4 49:2 50:10,23 51:7 54:10 78:20,21
funds 37:3 48:4 49:6 49:7,23 50:8
further 3:5 4:21 19:25 23:17
future 17:19 25:21 56:15,19 57:7 67:2 68:19

G

gain 41:24
gained 42:10
gallons 26:17,22,24 38:3 40:15,21 41:16 59:17 64:23,24 85:11,13 89:6,6,7
gap 89:19
gaps 79:9
Gardner 46:4,4 47:6 47:9,13 48:1 69:11 69:17,21 70:25 75:12,15
gas 9:20 73:19,19 74:16
gaseous 72:20,22
gasses 81:24
gazillion 89:7
general 59:23
generally 93:14
generations 69:25
gentleman 82:19
geological 68:24
geologist 1:18 2:21 69:16
gets 57:14
getting 33:12 37:3 41:20 42:6 60:4,5 74:18
giant 60:14
give 5:14,18 9:14 28:11 45:16 46:20 47:20 64:12 66:21 71:24 74:18 98:4
given 46:16 51:7 52:13 93:6,18
gives 38:24 46:25
giving 3:12 55:20 64:17
Glen 38:25 39:2,5 59:11 68:23
go 3:5 5:8 6:5,23 10:21 11:14 20:1 25:5 28:7,18,19 31:13 45:9 49:17 51:5 60:6 61:21 72:9 74:13 75:7 79:9 80:11,15 83:21 84:5 90:2,3,19 93:15 95:7 97:6
goals 27:9 39:19
goes 6:15 17:3 76:8 90:7 97:14
going 3:6,12 4:10 5:17,22 6:1,2,7 13:16 16:8 17:9 18:14,15,17,20 27:14 28:12,24 29:15 32:21 34:19 35:16 36:9 37:3,7 37:17,22 39:3 40:8 43:4 44:18 49:4,18 51:18 55:4,24,25 56:1 57:9,16,25 58:6,18 59:8,19,25 60:9,22 61:5,21 62:3,24 63:11,12,13 63:18,19 64:9,15,21 64:22,25 65:5,9,12 65:22 67:9 68:13 69:17 70:11,13,14 70:16 72:9 75:6 76:4,5,24,25 77:12 77:21 78:7 79:18 80:3,8,17 83:15 84:3 86:14,20 87:19 90:3 93:3,6,6 95:5
gone 53:13,14 70:15 89:16
good 10:14 29:22 61:14 70:4 84:9 93:20 97:13
goodness 78:16
gotten 29:19
government 50:24 64:8 94:6

gradient 14:15 30:9 84:3
grass 86:20
great 29:13
greater 9:7 12:2,14 73:25
greatest 73:25
greatly 31:23
green 6:7
Greenwalt 82:17,17 83:1,14,24 84:4,8 84:15,19 85:4,8 86:1
Greenwich 34:19 35:1,11,24 36:1 60:16 61:3 67:24 71:22 75:7,18
Greg 3:22,24 44:10 62:10 68:4 92:22
ground 27:18 36:18 62:6 70:18 72:11 76:24 85:2,20,22 86:12 89:14
groundwater 1:2 4:4 7:17,18 8:16,18 9:22 10:23 11:2,25 13:20 14:13,15,15 15:22 16:15 18:16 19:7,12 20:6,19,20 20:22 22:1,7,15 24:15 25:1,2,10,24 26:5 28:1 29:3,6,24 29:25 33:3 39:4,18 55:6 58:9 59:13 60:25 71:14 72:20 73:14,23,24 74:6 76:25 77:13,15 79:2 84:2 93:4
group 64:19 65:6 66:19 67:2
groups 34:17
growth 62:24 63:6,6 63:13,16 65:17,22 65:24 66:9,10,14 67:4,5,5
guess 66:15 71:2 72:9 81:7 93:12
guidance 74:1,4
guidelines 73:8,9,9
GW2 25:24 26:1,4 38:19 40:5 41:24
GW3 38:19 41:13 87:3
GW4 38:19 39:20 40:7
G-A-R-D-N-E-R 46:5
G-R-E-N-W-A-L-T 82:18

H

habitats 41:3
half 11:21 20:2 41:12 41:15 78:22 85:12
handled 93:25
handling 6:2 96:23
handout 6:6,7 18:9 38:22
hang 42:22
happen 48:19 51:9
happened 30:18
happening 85:18
happens 49:24
happy 69:5,9 96:19
hard 15:1 28:24 30:4 42:17 55:22,23 56:5 61:22 88:10,14,16
harder 62:2
hat 42:23
having 49:17 56:16 59:22 65:4 69:2,2 84:19 85:22 92:12
Hayed 91:20,20
head 82:7
health 7:15 8:1 19:4,8 20:8,15 27:22 51:4 51:8 71:1 90:8 92:17,19
hear 4:5,11 5:21 47:24
heard 76:12 92:10 94:19
hearing 90:11
heavy 98:6
help 32:18 33:5 46:10 46:11 53:20 64:17 69:9 81:17,18 83:20 86:18
helped 32:18
helping 3:15
helps 86:23
her 3:24
hesitate 98:8
He'll 16:9
high 24:23 32:10 53:17 95:17
highest 11:6,15 12:5 12:15 13:17 14:13 15:17 30:5 44:16 53:9 73:23
Highland 67:8
Highlands 39:23 40:2 43:15 62:14,19 63:1 63:15 65:18 67:11 67:19 68:25 69:1,4 69:5
highlighted 54:25
highway 60:1,14
HILL 1:16 3:2
hinder 56:18
hindering 57:8
hired 52:7
historic 13:25 14:11 15:9
historical 28:22 30:2 30:12 95:9
historically 17:1 36:6
history 5:18 6:23 91:15
hit 18:4 29:15 31:8 73:5 90:25
hits 28:25 29:23 30:2 35:25 36:1 71:11,12 71:13
holding 5:5
home 4:13 73:1 75:22 94:6
homeowner 70:22 95:3
homeowners 76:6 94:20
homes 59:20 64:22 75:1 85:15,16,20 86:17
homogenized 23:20
hope 79:11
hopefully 5:11 66:18
hoping 56:6 78:23 91:21
horizontally 89:13
horrific 96:3
hot 30:2 42:7
hour 60:3,14
hours 65:16
house 70:19 81:8,16
houses 64:25 74:13 80:11,16 85:3 91:17
huge 44:1
human 19:4,8 20:8 20:15 27:22
humans 51:4
hydraulic 35:5
hydrologist 45:20 60:25 70:18 83:20
H-A-Y-E-D 91:21

I

idea 9:14 38:24 72:18 74:18 84:9
identified 10:24 14:4 14:6 15:14 19:5,10 23:9,12 48:11,13,14 48:16 92:11
identify 79:9 80:10 80:16
III 1:23
ill 91:24
imagine 60:13
immediate 12:17 30:5 80:23
immediately 11:8 50:5 54:3 86:15
impact 13:19 19:12 20:22 23:18 38:10 40:22 43:21 44:13 55:19 57:17,25 64:25
impacted 35:2 71:5 91:14
impacting 41:6
impacts 65:11
implement 17:11

46:20 54:4 72:17
implementability 21:7
implemented 52:24 94:22 95:1
implications 95:1
important 49:18 95:14
imposing 80:23
inaudible 35:4 67:8
include 19:8 45:3
included 87:17
includes 21:23 23:6,8 65:6
including 24:4
Incorporated 16:20
increase 23:20,22 24:1
indicate 30:14
indicated 69:19
indicates 31:22 70:9
individual 59:20
indulgence 5:4
industrial 95:14
industry 37:2 50:7
inexact 42:15 74:8
infinite 77:22
information 4:21 7:25 14:1 15:9 22:12 64:13 80:1 90:15,17 96:14,16 96:19
informed 58:18 64:14
inhalation 19:6
inhaling 72:13
initiated 7:7,21
input 4:6 17:9
inputs 58:12
inspect 97:7
install 40:13
installation 23:10
installed 9:15,24 89:18
installing 18:14
instead 17:14 80:17
institutional 21:20 25:18
instrumental 3:15
integrated 59:10
intend 17:4
intending 68:18
interested 59:22 68:1 74:25 79:19,22 80:10,12,17
intersection 6:12
interview 10:15
introduce 2:12
intrusion 18:18 72:16 72:19 73:15 74:5 79:1
invasion 95:18
investigate 8:21
investigated 9:13
investigation 1:5 7:22 9:7 10:22 36:19 48:12 55:1 78:21
investigations 8:13 8:23
inviting 53:1
involved 45:9 66:12 67:4 84:13
involvement 2:8 23:1
ISRA 22:15
issue 95:13
issued 52:6,23
issues 57:4 63:24
items 52:12
iterative 8:8 45:10
Ivany 94:2,2,16 95:2 95:7 96:20
I-V-A-N-Y 94:2

J

Jersey 1:3,10 7:9,15 11:1 14:21 17:24 20:18 43:15 61:1,22 62:1 72:8 88:19 92:4,23
Jersey's 13:19
joined 67:6
July 4:10
just 3:5,14 6:5 9:13 12:7,10 15:3,19 17:18 22:9 28:20 29:17 32:23 33:11 39:10 40:18 42:12 42:15 43:6,11 51:18 52:15 54:11 58:23 59:12 61:4,13 63:3 66:7,25 67:17 68:5 76:9 79:5 83:23 89:5 91:1,22 95:7

K

keep 5:3 56:9 77:7 80:5
keeping 58:18
kept 79:1
kidney 12:4,4
kidney-shaped 26:7
Kim 1:18 2:17 70:4
kind 42:13 43:5 80:5 81:24 96:7
know 3:23,23 5:7 9:9 22:10 32:21 34:23 35:9,19 39:5 44:12 44:17,23 51:16 52:9 53:18 56:2,9 57:11 57:15,23 60:3,18 61:18,18 62:12 64:21,23,24 67:7,24 70:21,22 71:7,17 72:3,6 75:4,8,11 78:8,9,10 79:25 80:3,4,4,13,16,20 81:9 82:8 83:7,12 84:17,24 86:9 88:21 88:25 89:11,15 91:14,17 92:2,9,14 92:23 93:13 94:24 94:25 95:24 96:13 97:5,6,18,21,22 98:10
knowing 58:16 96:4
knowledge 45:22
known 12:18 31:11
Kovacs 28:14,15 29:20 48:25 49:8,16 50:14,19 54:13,13 54:20 55:10,16 71:7 76:18,18,23 77:11 78:1,6
K-O-V-A-C-S 28:15

L

lady's 46:7
land 40:3 61:11 62:7 64:20,21 86:13
landfill 36:10 75:16
large 9:8,11,11 10:24 24:4,19 35:21,22 40:12,12 57:14,16 58:19 62:23 76:5 77:25 81:3 86:17
Larry 65:2 66:25 67:7
Larry's 67:2
last 9:3 21:10 28:12 67:6 89:10
late 6:24 90:8
later 3:13 6:2,17,23 18:10,24 19:25 48:20 79:12
law 46:8,14,16,25 47:4 67:20 93:1 94:11,11,14,21
laws 46:9
layered 45:11
layers 29:2
leaching 25:9 32:7,16 33:2 35:19 77:9
leading 61:5
least 34:1 67:9 73:2 78:17 89:21,23
leave 5:9
legal 46:25 54:7 95:3 97:19
legally 17:10
legislature 65:20 66:17
length 11:12
lenses 29:17,18
less 12:23 16:6 19:13 27:24 60:7 85:12,23 87:9
let 3:5 22:9 28:20
letting 80:13
let's 6:5 31:12 49:2 82:14
level 13:22 14:21 15:6 19:19,19 20:18 25:15 64:7 74:1,4
levels 20:21 25:3,3

30:8 32:7 55:2 57:17 66:13 80:22 81:12 95:17 96:3
leverage 46:10
light 23:4
like 2:3,9 5:4,16 10:17 17:11 20:1 28:7 38:6 42:12 43:10 45:21 46:2 49:8 51:15 52:15 53:2,3 60:10 61:12 62:23 66:7 69:24 72:5 79:5 84:23 88:1 89:19 90:12 91:25 93:15
likely 27:18 47:18,25 52:17,18 58:4 61:12
Limestone 58:3 89:12
limit 25:20
limited 11:23 21:22 23:8 49:23 50:10 78:22
limits 25:12
line 6:15 12:12,13,22 24:17 26:9,10 42:4 62:20,21 75:21,25 89:4
lines 12:2 24:14
lingering 36:14
linkage 67:10
linked 30:25
liquids 72:21
list 4:20,24 7:20 8:2 8:10,14 9:5 34:11 50:4 79:15 80:13
listed 7:19 16:4 55:7
little 5:18 6:2,16,17 10:19 26:7 36:4 40:9 59:12 62:2 82:15
live 53:18,19 59:2 70:18
lived 91:3
living 67:13 84:25
local 27:2 29:12,17 57:4,19 58:17 62:2 63:23,25 64:7,15 84:13
locals 57:5
located 6:13 19:16 23:13 26:20 42:2,3
location 8:25 21:1 29:10 31:7,7 59:17
locations 14:1
long 11:13,21 42:14 61:10 69:24 70:1 78:8,9 80:18 88:7 90:12
long-term 4:9 21:2 25:17 27:7,20,25 80:7 81:2
look 10:2 15:2 21:2,3 21:5,6,7,9,17 33:19 37:9 38:7,21 43:2 43:24 44:3 54:6 62:18,22 65:8 69:23 73:20,22 74:12 77:24 89:8 92:5
looked 9:6,14 19:11 20:9 21:13,15,19,21 21:23 22:1,2,4,5 23:5 27:24 38:2,14 38:18 41:13 42:5 75:21
looking 8:13 10:8 12:19,24 34:16 36:10 38:15 40:17 40:20,25 41:14,19 42:8 44:4 54:16 56:11,12 70:22 74:23 78:12,24,25 87:3 97:2
looks 89:18
lose 33:5
lot 5:7 16:1 31:24 36:8 41:20 43:22 53:13 56:16 61:20 62:1 70:7 85:3,4,19
love 96:15
low 18:21,22 19:1 30:8 32:7 38:15 72:5
lower 36:1
L&L 11:18 13:1,7 14:23 15:25 16:21

M

machines 31:10
made 9:1 64:6 70:4,4 94:12
mailed 82:24
mailing 4:20,24 34:11 79:15
mailings 80:15
main 2:9 11:18 33:6 41:19
maintain 87:13
maintaining 32:8
make 4:16 34:4 45:15 47:23 53:25 59:24 64:13 70:8 84:9 85:3 88:1 90:19 97:23 98:2
making 67:16
manager 2:15 3:3
mandate 65:20 66:9 94:6,11
mandated 63:19 66:16 94:8
mandating 63:9 66:10
many 33:14 53:16 64:24 75:24
map 6:5,14,16 11:25 15:12
March 94:19
mass 42:3 80:15
massive 68:2 83:9
master 63:18
math 37:16
matter 82:18
maximum 20:20
may 13:14 15:21 26:6 57:15 76:17 77:8 79:8,13 97:24
maybe 2:3 23:13 30:18 53:19 60:19 72:6,10 78:4 79:19 80:14 90:16
ma'am 36:23 39:13 54:8
MCL's 20:20
mean 32:21 35:9 54:18 63:9 65:19 77:1 78:9 89:15 90:1 96:5
means 99:17
media 9:21 25:12
meet 66:13 73:11 93:1
meeting 1:6 3:16,20 4:25 67:1 83:6 88:6
meetings 53:14 59:8 65:4 66:22
member 47:18
members 83:7
memo 76:12
mention 3:5 23:7 95:19,20
mentioned 15:8 16:11,23 19:17 22:22 29:22 72:8 76:19 94:18
met 27:3 68:16,17 96:10
metal 54:15
metals 10:13 54:23
methods 20:4
MIA 51:18
Michael 37:11
microphones 3:7
middle 61:24
mid-teens 18:23
might 3:10,24 16:24 28:9 31:11 32:6,7 32:16,23 42:14,23 45:5 74:20 90:11
migrate 84:1
migrating 57:1
migration 34:25
Mike 76:10
mile 11:21
miles 9:10 11:13 68:8
million 13:21 14:3,20 15:6,10,18 16:6 19:20,23 20:22 25:15 38:3 40:15,21 41:16,23 44:17,19 59:16 74:6 82:15 87:10,12 89:6
Millions 69:16
mind 5:5 71:25 82:5

84:8
minimize 25:9
minute 23:7 26:17,23 85:11,13
mixed 23:19 24:18
mixing 21:22
mobility 21:4
model 38:12,12 39:3 58:10,11 59:13,22 69:3,8 70:6 84:23 84:25 90:1,17,18
modeling 42:13
models 39:2 57:9
Modern 11:19 13:2 14:23 15:25 16:22
moist 24:24
moister 25:5
moisture 24:25
money 37:6,9 49:14 50:2,4 55:25 76:3 78:22,25 87:25
moneys 17:15
monitoring 9:15,23 13:12 18:15 25:17 27:7 70:18 79:3
month 33:17,18 67:17 97:15
months 34:1 62:16 66:18
moratorium 84:9
more 4:23 6:23 8:4 19:13 21:24 22:12 22:17 24:9,24 33:18 34:5 38:7 56:20 58:4 61:12 80:2 83:25,25 86:10 97:11
mortgage 88:2
most 11:22 18:23 26:5 27:18 30:17 31:22 42:1,5 47:25 51:4 58:2 64:14 73:25 78:24 86:6
mostly 15:12
mountain 62:22 65:24
move 75:18
moved 72:1 82:7
moves 80:6
moving 13:16 32:7 58:7 60:10,15,21 79:3
much 3:18 4:23 5:10 9:7,25 10:14 32:6 32:24 38:7 44:1,12 44:13 49:3 55:25 82:12 85:1 89:1,4 97:12 98:12
municipalities 58:22 68:7
Murray 1:16 3:1 10:17 16:11,23 19:17 26:7

N

Nace 1:19 2:23,23 92:3
name 2:7,14,23 3:10 28:11,12 66:21
named 46:17
Nancy 39:14 67:18
narrowing 8:14
national 7:20 11:9 13:23 15:14 16:19 26:15 29:1,24 30:3 55:19 56:3 62:13 65:19 86:5 95:10 96:2
nationally 39:22
natural 22:3,4 27:6 88:19
nature 8:18 20:2 30:19 31:16 58:19
near 67:2
nearby 86:12
necessarily 47:10 80:22 81:17
need 21:11 22:8,11 25:17 33:18 57:18 58:22 67:14 68:12 76:5,20 79:9 81:22 84:6
negatively 35:2 41:6
negotiate 44:14
negotiations 17:13 44:20,25 45:1,4 46:2,20 49:17 53:3
neighborhood 75:6,7 75:24
neighbors 98:3
new 1:3,10 2:9 7:9,15 8:9 11:1 13:18 14:21 17:24 20:17 43:15,15 61:1,22 62:1 72:8 73:8 88:18 92:3,23 93:7 93:9 95:15
news 61:14
next 14:6 17:18 26:20 35:16 51:10 71:23 75:2 79:12 80:5 95:8 97:18
night 2:3
nine 20:12,13,14 22:24 23:4 26:1,2 45:3,7 76:2
ninth 23:2
noncarcinogenic 19:9
nondetect 18:22
nondetectable 19:1
nondetects 30:10
normally 88:24
north 11:9,10 62:18
note 31:15 44:8
noted 14:18,22 41:9
notes 28:21 99:7
nothing 49:8 76:12 84:15
notice 13:2 34:13 82:19 83:9,12 85:18
noticed 17:17
notification 82:24 83:5 94:12
notified 16:13,19,21 52:9 82:21 95:4
notify 94:9
nowhere 61:25
NPL 50:15,16,18
number 4:15 9:12 10:2 18:2 20:9 21:13 28:21,25 30:14,22,23 35:15 38:13 42:17 44:5 48:21 54:21,23 60:8 60:9 66:12 71:15 77:22 78:3 79:25 85:7,9
numbers 32:20 42:18 42:19 64:19 70:5 77:1,3

O

obviously 31:4 77:17
occurring 25:11 60:17
off 6:15 41:4 60:5 62:5 76:8
offer 47:16 54:3 76:15
office 2:9 63:15 65:16 67:3,5
official 55:21
officials 91:21
off-site 21:24
often 34:4 50:13
oh 43:8 50:22 51:24 61:4 78:16 85:6
okay 5:21,22 33:6 34:2,3 36:23 49:3 50:20 75:20 94:1
old 61:4,6,20
once 17:5 27:16,25 54:2 61:14 62:5 69:13
one 5:2,4 7:2 10:24 10:24,25 11:3,17,20 12:1,25 13:5,20 14:2,20 15:1,5 16:2 16:6,17 19:20,22 20:18,21 21:16 25:14 26:19 27:3,10 31:2 33:18 38:6 39:2 40:11 41:8 42:20 44:16,19 50:23 54:10 55:20 56:25 58:8 62:23 67:1,1,9 71:14 76:18 79:1 80:9 83:11,14 89:10 90:6
ones 8:15 66:16,16 68:1

ongoing 17:20 52:4
only 10:9 13:8,8 33:14 42:10 44:18 48:11,15 51:1 76:10 93:14
onto 46:21 53:2 60:4 93:23
open 5:13
opened 5:25 18:5
operable 1:2 5:23,25 6:4,9,15 7:21 11:11 17:21,22 18:2,6,7 18:11,18,19,22 35:15,17 39:4 72:15 72:17 73:6
operate 87:13
operated 96:6
operating 96:6,12
operation 30:19 89:23
operations 8:24 14:12 16:16 36:9
opinions 52:19
opportunity 5:14 46:21
opposed 39:18
option 17:8 21:23 58:23
options 46:23 48:22
order 22:12 32:24 33:3 38:2 40:19 48:8,21 52:6 70:9 77:7
organic 6:24 10:11 10:12 72:23 77:2
orient 12:7
origin 46:9
original 9:5 55:7 90:9
originally 86:11
orphan 49:24
OSHA 96:8,8,20,21 96:22,24 97:8
other 2:10 4:5 8:6 10:2,25 11:19 15:20 15:23 16:24 18:8 20:11,25 22:24 25:25 26:1 27:24 34:18 41:2,12 43:16 45:12 46:22 47:22 52:21 53:8 54:22 55:23 62:22 69:6 71:4 77:17 78:3 83:12,14
others 67:10
ourselves 33:20 92:18
out 2:5 24:22,25 25:5 31:1,9 32:20 34:10 37:23 38:17 42:16 51:13 56:2 60:1,3,9 60:22 61:24 62:18 66:2,19,21 71:21 72:9 76:2 77:18 78:10 79:6,9,11,21 80:15 82:25 83:8 85:25 86:12 87:7,7 87:22 89:4 91:8,24 92:15,19 96:1,9,13 98:11
outline 6:8
outside 55:14
OU1 56:23
OU2 56:23 68:9 71:8 71:9 78:7 83:16 93:3,19
over 5:17 11:4 16:9 27:8 31:18 32:1 33:17 38:2,3 40:5 43:4 52:8 62:22,22 65:24 76:6 82:15 86:17 87:4,7,10,20 87:25 95:11,12,23 96:10
overall 20:14 41:25
overhead 6:9
own 47:7
owner 16:16
O&M 87:12,14
O'Connell 1:18 2:17 2:17 33:23 34:2,9 34:14 42:12 43:18 46:13 47:8,12,15 48:3 49:6,15,20 50:16,22 52:3 53:12 53:21 54:18 55:22 57:3,11 63:22 64:2 71:11 77:14 79:5 80:19 81:11,18,23 82:9 87:11,21 88:3 88:9,23 91:5 93:20 95:5 96:5,22

P

PA 1:24
pace 35:3 76:1
Packaging 16:20
PAD 1:17
page 87:3
paper 34:13 53:15 83:10
papers 83:13
parameters 55:15 93:15
parking 16:1
part 2:11 6:4 8:12 11:3 12:14,16,22,23 13:13,20 14:2,20 15:5,10,18 16:6 18:17 19:20,22 20:18,22 23:21 25:14 26:5,8 27:4,5 27:10 28:7,12 30:5 30:6 31:21,22 35:15 39:4 42:4 71:14 72:15,16 79:1,7 88:13 97:18
participate 17:15 48:18
particular 92:7
particularly 39:21 86:7
parties 13:1 16:14 37:7 46:17,18 47:1 47:17 48:5,6,7,11 48:12,23 49:25 51:13 52:10 53:1 54:4
parts 19:2 26:10 27:8 29:7,11 30:1 31:3,8 31:19,20 36:6 74:5 74:6
party 22:17 51:16 53:11
Pasquerelli 67:22
pass 41:1
passes 89:12
past 6:4,21 36:11,12 52:8 95:21 96:2,7 96:14 97:10
Pat 1:17 2:7 82:24
patch 83:18
pathways 20:7
pay 46:1 76:4 87:25 88:7
payments 88:1
PCE 6:21 7:2 10:9,25 11:15,20,22 12:19 14:18 15:23 16:21 16:23,25 19:9,18,20 26:19,21 31:16,17 31:19,23 32:23 40:19 41:17 55:8
PCE's 93:8
peace 71:24 82:5
Pechiney 16:20
people 2:10 3:15 32:22 33:14 35:10 44:21 51:23 53:20 59:9 65:11 74:23 75:24 76:2 80:10,17 83:4 89:20 91:3 95:21
people's 74:14 90:12 92:17
per 11:4 12:14,16,22 12:24 13:14,21 14:2 14:20 15:5,10,18 16:6 19:2,20,22 20:18,22 25:14 26:8 26:10,17,23,24 27:4 27:10 29:7,11 30:1 30:6 31:3,8,19,20 31:21 33:1 36:6 38:4 40:15 41:16 42:4 63:12 64:22,23 64:24 74:5,6 76:21
perc 7:3
percent 18:4 49:11 85:24 86:19
percentage 29:23
perched 29:2,7,11,12
perforated 25:4
perhaps 30:25 89:19

period 4:9 17:7 23:16 32:4 33:13,18 34:23 35:7 47:17,20 78:11 91:4 97:14
periodic 79:16
periodically 97:7
permanence 21:3
permanent 13:12 28:1,5,13
permeability 23:23
permit 93:9
person 56:14,25 57:7 58:2,20 68:15 76:10
personally 95:25
perspective 43:7
peruse 46:6
phase 8:22 9:3 18:12 21:21 23:6,21 35:16 37:1 53:22 72:20,22 79:20
phased 8:13
phases 9:2 91:13,13
Phillipsburg 58:6
phone 79:24
physical 57:12
picked 4:8 83:13 91:17
picking 31:6
Pine 61:2
pinned 63:20
pipe 25:4 31:2
pipes 25:5
piping 27:14
place 9:17 32:19 59:7 61:22
places 86:6
plain 62:21
plan 1:6 4:6,8,16 5:15 18:12 38:18,21 41:8 47:11 48:2,25 49:4 52:14,20 62:15 63:2 63:10,18 66:17 68:2 79:7 97:22 98:4
planning 18:11 47:21 62:11 63:14,21 64:4 68:13 74:9 80:5
plans 58:17 59:7 83:5
plants 56:20
Plastics 16:20
Plaza 1:23
please 4:16 97:14 98:8
plug 59:14
plugs 76:7
plume 8:16 11:11,20 12:19 15:22 22:6,7 26:6 27:4,5,8 30:6,7 31:13,14,16,16,17 31:25,25 32:2,2,9 32:10,15,17,23,25 33:3 34:21 35:1,6 35:18 36:20 38:1,16 38:20 40:8,11,12,20 42:2 43:6,9 58:3,7 59:24 60:10,21 72:22 74:19 77:7,8 77:18,20 78:4,5 83:21,24 84:1,3,19 89:15 90:3
plumes 8:25 10:23 19:13 55:9
pneumatic 23:25
pockets 29:20,21
Pohatcong 1:2 2:13 2:16,22 5:23 11:7 39:25 40:23 58:6 65:24 69:3 94:8
point 13:6,9 17:2,12 17:17 35:17 37:6 51:18 70:5,8,17 76:16 79:6,14
points 9:24 30:23
police 94:17
pollute 44:21
polluters 88:20
pollution 55:11
portable 71:16
portion 12:10 76:5
position 47:20 48:7
possibility 72:24 80:13
possible 5:9 8:5 34:3 35:18 36:4,13 50:13 73:3
potent 51:4
potential 8:3,9 9:6,12 16:14 19:10,21 40:25 51:12 52:9 53:10 95:18
potentially 12:25 22:16 46:18 68:7
pounds 32:24 33:1 76:20,21,23 77:5,9 77:12,12 78:4 89:3
powers 46:16
precautions 95:11
predict 42:14 56:5
predicted 43:11
predictions 90:20
prefer 49:21 50:11
preferential 45:17
preferred 17:6 22:20 22:25 25:23 27:19
prepare 79:16
present 32:5 34:21 47:19 55:14 63:21 87:3,15,19 96:2
presentation 2:11 5:6 28:6 67:16
presentations 5:2,9 5:13
presenting 51:8 53:24
presently 31:20
presents 26:2
preservation 62:20 62:23 63:10,19
pressure 24:23 56:17 76:7 83:19 84:5,7 93:4
pretty 9:25 10:14 24:4 29:9 53:17 82:23 85:16
prevents 25:11
previous 12:25 14:12 15:8 16:25 26:6
previously 22:22 72:21
primarily 10:9
primary 42:1
prior 23:10 27:1
priorities 7:20
prioritize 50:20
pristine 65:21
private 37:2 44:14,14 49:21 50:23
privately 50:12
probability 53:9
probably 4:7 5:7 35:11 54:22 81:22
problem 28:19 37:25 51:9 55:11 61:15 73:15 74:2,20
problems 38:5 61:21
proceed 54:3
proceedings 99:6
process 8:8,20 10:15 21:15 22:10 45:10 45:11 50:25 51:5 53:2 56:15,16,18 57:2,6,8 80:7,18
professional 1:13,23 45:20 99:12
program 2:18,21 16:8 22:15 55:5 57:24 58:25 65:3 80:25 88:19 92:16 96:12
programs 59:10
project 2:15,22 3:3 33:10 48:10 56:2 84:10
projects 50:12 51:15 57:15
proper 68:13
properly 82:2
properties 25:19
property 12:18 29:1 77:23 86:13,14
proposal 59:16
proposed 1:6 4:16 17:6 26:11 38:18,21 41:8 52:14,20 83:5 98:4
protect 68:14 96:25
protecting 97:2
protection 1:6 7:9,10 7:16 11:2 17:25 20:14 96:9
protective 27:21
provide 48:4 64:19 79:17

providing 4:12
proximity 14:13
PSA 9:5
PSA's 8:9,14
public 1:6 3:19 6:18 7:4,12 13:3 16:3 17:7,9,14 37:5,9,13 37:25 38:11 39:9 43:21 45:15 47:16 47:18,19,23,25 49:22,22 51:8 52:15 52:21 55:19 56:9 66:4 71:1 75:4,9 88:13 89:18,22,24 90:20,21,25 91:6,8 91:10,10 93:4,16
pumping 38:4,8,9,13 38:14,17,19,20,23 85:11,12
purpose 8:17 20:6
purposes 22:13 43:3
pursue 46:19 47:1,4 48:20
purview 96:13
put 4:23 13:9 25:19 43:7 47:14 50:4 55:20 59:17,20 63:2 64:19,22 67:9 75:25 79:21 83:9,18 85:7 86:13,18 91:6,13
putting 24:21 39:11 49:11 71:15 75:21 81:19 85:21 86:1
PVC 30:21
p.m 1:12 98:13

Q

qualitative 73:20
quality 11:2 71:14
quarry 35:25 74:12
quarterly 71:21
question 23:15 28:11 37:12 39:6 44:24 54:10,11 55:17 58:20 68:22 72:2 75:2 83:14 84:18 88:4 89:10 93:11,21 94:5 95:8
questionnaires 91:24
questions 3:9 5:5,8 5:10,11,13 18:10 28:8 69:4 70:3 97:11,13 98:9
quick 27:11 69:15,16 70:20,24 85:14
quickest 42:7 69:14
quickly 5:9 61:17 62:5 80:15
quite 20:9 35:11

R

rachet 78:20
radon 81:4
rain 30:25 31:9
range 17:24 18:22 31:21 73:21 88:12
rank 50:17
ranked 50:3,24 51:7 55:18
ranking 50:15,16,25 51:5,9 56:4
rapidly 89:12
rate 37:18 38:9 84:21
rates 38:14,14,23 92:7
raw 64:21
reach 14:20 39:19,20 66:19,21 98:7
reached 51:13
reaching 72:25
read 34:24 35:13 53:14 87:16
reading 72:4
ready 79:14
real 37:25
realistic 49:3
realize 51:18 73:11
realizes 51:17
really 2:1 3:18 15:3 30:4 32:6 33:15 36:15 42:15 43:2,18 45:6,9 49:3,5 55:22 56:5 57:5,13,18 63:23 68:13 71:25 72:5 73:5 75:11 84:12 91:15 98:6
realtor 95:4
realtors 36:25 94:13
reason 4:1,5 42:1 48:19 55:7 69:21 75:13 90:24
reasons 23:14 28:21 33:7 38:6
receive 24:20 47:16 52:16,18 88:10
received 8:8 52:14
recently 6:1
recognize 82:22
recommendation 40:3
reconsider 76:17
record 17:9 28:13 53:25 88:13 89:24 90:20,22 95:8 97:20
records 91:16,18
recourse 95:3
RECRA 96:12
redevelopment 58:25
reduction 21:4 27:21
referred 55:12
reflect 56:18
reflected 91:16
regard 50:20
regarding 37:12 95:8
regards 28:16 48:25 54:14
region 1:6 91:4
regional 27:2 29:14 29:15 62:15 63:10 68:2
Registered 1:12 99:12
registry 92:5
regs 96:22,24 97:8,8
regular 92:10
regularly 66:13
regulated 96:11
regulates 93:24
regulations 58:22 96:7,25
related 2:13 8:25 16:17 19:14,15
relation 15:19
relative 43:23
relatively 32:3,9 61:17 62:4
releases 36:11,12
relevant 20:16 28:4
relieved 2:5
rely 98:6
remaining 32:11,12
remains 17:16
remedial 1:5 7:22 10:22 22:22 36:19 48:12 54:25
remediated 25:22 27:9 28:1
remediation 14:12 36:25 46:12 69:13 81:13,22,23
remedies 21:18 27:24 45:11
remedy 5:24 17:5,7,8 17:11,22 21:3,12 22:8 27:25 28:2 37:8 40:17 41:11,23 45:3,6,13 46:20 52:22,24 53:23 79:15
remember 26:6 70:17
removal 11:5 80:24
removed 9:25
removing 37:17,18
repeat 3:10 83:23
report 34:24 35:13 92:11
reporter 1:13 99:12 99:18
Reporters 1:23
reports 92:6
representative 93:22
representing 51:19 51:20
represents 23:3
reproduction 99:17
request 93:16
requesting 33:23
requests 34:5 69:6
require 14:21 57:15
requirement 21:18 93:9 94:14
requirements 20:17

28:4
requiring 22:16
research 69:1
residences 18:3 71:16
resident 33:9 94:4
residential 71:10
residents 92:16 97:3
residual 31:4
resource 93:4
resources 63:6 65:19 65:21 88:19
respect 49:1
respectfully 33:12
respond 53:5
response 53:6
responses 8:25
responsibilities 46:15
responsibility 47:1
responsible 13:1 16:14 22:17 46:18 47:1,17 48:5,6,6,11 49:25 51:13,16,17 52:10,25 53:11
responsive 98:2
rest 27:4
restoration 41:10,18 42:11 69:23
restore 43:6
restriction 7:11
restrictions 25:18
result 13:13 62:4
results 54:15,25 55:1
review 46:24
reviewing 7:24
revising 17:8
re-injected 27:17
re-injecting 39:8
re-injection 27:1
RI 8:7,17 10:15,19 16:12 17:19 18:11 19:5 28:23 31:1
Richard 66:24
Rick 46:4
right 4:24 5:16,20 6:19 10:21 11:18 13:2,7 16:3 19:3 24:16 26:13 29:8 30:7 36:21 45:24 54:20 59:7,9 63:14 76:22 77:16 78:23 86:15 87:21
ripe 95:21
risk 2:25 19:4,24 27:21 50:25 51:4 73:3,21 80:23 81:1
risks 19:8,11,14,23 20:8 25:11 78:25
river 86:8 95:23
road 60:5,6
Rob 1:18 2:20
rods 13:10
Ron 82:17
room 2:4 3:19
ROSEBROCK 87:1 87:9,14,18,24 88:4 88:18,25 89:10 90:1 90:10,16 91:1,7,19
Rosemberg 1:16 3:1,2 10:18,20 57:13 62:8 89:8 90:6,14
rough 32:13 77:4
roughly 32:23 33:1,4 37:17 77:7,9 78:3
round 79:10
Route 1:10 6:11 11:10 12:9,21 14:24 16:3 36:9 62:19,21
routes 19:5
RPM 1:17
RPR 99:12
rumor 76:12
run 37:24 38:4 77:18
rush 60:14
R-O-S-E-B-R-O-C... 87:1

S

safety 95:12
salivating 83:17
same 9:25 28:14 31:7 32:12 37:18,19,20 42:24 45:14 55:24 60:8,9 99:9,17
sample 13:5,11 18:23
sampled 10:1 18:2 30:22 93:14
samples 9:20,21,22 10:4,5,6,6,10 73:19 73:19 74:15 90:9
sampling 7:17 14:5 17:25 18:16 24:10 60:23 70:9 96:21
save 80:14
saying 33:25 36:18 44:4 53:1 70:14,15 70:19 95:15,22
says 74:1
scale 57:14 58:19
scared 60:16
scenario 59:14 97:1
scenarios 38:17 69:22
scheduled 67:2
schematic 27:11
school 1:10 3:22
science 42:15 73:4 74:8
sciences 73:16
Scott 3:22,24
screen 13:10 25:3 32:3
screening 21:15
sealed 66:3
second 20:2
section 78:3 83:21
sediment 10:4
see 12:11 15:1 28:24 30:4 31:12 38:22 39:1 43:3 53:19 55:13,16 59:9 60:18 62:4 68:6 69:17 70:10,12 74:16,24 82:14 85:17 92:6 93:7,25 98:1
seeing 61:4 77:19 97:19
seem 61:7
seems 61:9 69:24 83:1
seen 4:8 92:11
seeping 72:11,24
select 22:8 52:22 79:15
selected 8:20 17:5 22:24 45:2,13,19
selecting 53:22
semi-volatile 10:12
send 34:10 52:25 83:4 92:19 97:17,24 98:5
sending 80:15
sense 70:1
sent 83:8 91:24 92:15
separate 55:10 67:19
Seppi 1:17 2:1,7 3:4 28:10 68:21 83:3 86:24 97:11
September 8:11 9:4 67:6
septic 85:21 86:2,18 86:22
series 26:12
service 11:19 13:2 14:23 15:25
Services 16:23
set 3:16 37:6 47:7 59:8 65:6 97:21
sets 40:16
setters 35:3 76:1
settled 21:14
seven 68:7 93:15
several 14:1 33:11 78:17
sewage 56:19
shallow 21:21
share 16:1
sheet 4:22 79:22
Sheola 66:24,24
shirt 86:25
short 5:3 39:10 48:2 53:4 69:18 81:1
short-term 21:6
shoulder 46:11
show 6:8 14:7 15:4 18:25 57:10
showed 26:7 45:7
shown 90:22
shows 89:24 90:20,22
sides 86:10
sign 4:19,22 46:21,23 53:2
signed 80:14
significance 40:1

significant 28:25 40:22
significantly 12:23 43:16 74:7
signing 51:14
sign-in 4:22
silt 29:17
Silvia 28:14
similar 81:15
since 39:19,21 49:7 68:1 72:1 79:19,22
sink 29:14
Sipple 44:10,10 45:18 45:25 62:10,10 63:25 64:18 65:15 66:15 92:22,22 93:12 94:1
sir 44:9 46:3 62:8 68:22 82:16 86:24
sit 82:5
site 1:2 2:13,16,25 4:4,21 5:19,23 7:19 7:23,24 8:23,23,25 9:1,9 16:14 17:20 19:13,14 28:17 45:23 46:9 47:3 50:17,18,22,23,24 51:22 55:7 56:7 65:25 67:16 78:1 94:7,9 95:14,15 97:6,22 98:10
sites 48:23 49:24,24 49:25 50:3,9 51:1,3 51:6,8 55:18,24
site-by-site 51:6
situation 61:2
six 40:16 77:18
size 32:25 33:4 43:6
slew 96:24
slide 26:6,8
slides 40:8
slug 60:14
smaller 10:25 12:11 44:2
Smart 63:16 65:17 66:14 67:3,5,5
softem 86:23
soil 4:3 9:18,20,21,21 13:16,18,19,20 14:4 14:8,12,19 16:7 19:6,16 20:5 21:16 21:21 22:14,20 23:17,20 24:4,7,12 24:20 72:25 73:18 73:19 76:24,24 77:14 80:20
soils 19:15,20 20:21 23:18,24 24:6,18,24 25:13,14 32:17
Sol 14:24 16:4,24
solely 19:15
solution 34:20 56:13
solutions 28:5
some 4:7 14:16 18:4,8 18:23 25:2 29:2 30:12 32:13 35:7 40:10 41:2 45:8 51:18 52:6,7,12 53:8,10 54:23 55:1 60:23 68:25 69:3,18 73:18 76:20 80:1 81:12 85:14 86:19 94:20 96:16
somebody 46:1 66:19 68:21 72:7
somehow 31:6 80:21 91:13
someone 89:4
something 8:24 29:18 31:4,5 32:8,19 57:9 73:5 77:21 80:23 81:2 92:20
Sometimes 79:7
somewhere 68:10 88:11 89:3 90:24
soon 88:16
sorry 15:20 39:1,5 46:5
sort 45:2
source 8:3,9 9:6 13:15 19:21 22:3,4 23:8,11 25:21 26:14 26:21 27:12 31:23 34:22 36:5 61:10 62:5 76:21 77:5,10 85:17
sources 8:5 36:4,14 44:13 62:2 66:5 77:6
south 14:24 62:21
southern 6:3 83:19
southwest 18:1
southwestern 83:21
SO2 21:20
SO3 21:22 22:21,24 23:3,5 25:8
SO4 21:23
space 73:1
speak 3:8 57:19
speaking 70:21
specific 21:1 33:24 92:15
specifically 14:5
spell 28:11
spelled 38:16
spend 76:3
spent 65:16
spoke 72:7 75:24
spot 30:3
spots 42:7
spread 58:4 87:4,6,22
staff 3:21
standard 10:11 11:3 20:19
standards 27:3 93:2
stands 90:23
start 36:15 38:4 41:2 41:19 44:16 61:15 62:5 80:12 83:18 86:16
started 4:10 7:11 18:11 40:9,22 44:24
starting 12:3
starts 69:13
state 20:23 21:8 32:9 32:10 33:4 34:21 52:5,5 55:13 62:13 63:9 64:1,2,7 66:9 66:12 67:3 71:15,15 72:8 73:7,12,13 74:4 77:13 81:21 88:18 92:3,20 93:22 93:24 94:11,25
stated 69:12
states 22:15
status 56:10 79:17,25
statute 20:11 46:14 46:24 47:5 48:4
stay 50:18
steady 32:9,10 33:4 77:13
stenographer 3:6
Stephen 1:17 2:14 10:21 16:9
Steve 4:14 5:17,19 76:19 79:23 96:18 97:17,20,24 98:9
still 25:10 29:10 31:3 31:6 32:16,19 35:6 37:13 75:5,8 76:8
stop 3:10
stories 95:21,25
strange 83:1
stream 41:4,5 60:4
streams 10:5 38:5 41:1 43:21
Street 1:24 7:5 11:18 16:2 71:3
stripper 27:15
stripping 27:1
studies 15:8 18:18 22:17 52:4 92:1,19
study 1:2,5 7:22 8:12 9:9 16:10 20:1,2,4 22:9,11 35:15,17 36:16 40:2 48:15,16 53:23,24 72:15,16 73:6 78:13 79:2,7 80:3,8,20,24 81:2 82:12 91:3,23
stuff 62:2 66:8
subject 11:4
subjected 10:9 96:3
substantial 27:20 84:7
substantially 30:20 31:18
successors 17:2
sucking 24:22
suite 1:24 10:10 54:14
summary 98:2

super 60:1,13
Superfund 1:2 2:18 2:21 5:23 46:24 47:5 48:4,9 49:2,9 55:18 59:1,8 65:11 65:13,25 92:16 94:9 94:21
Superfund's 46:14
supervision 99:17
supervisor 2:18
supplies 71:3,5
supply 6:18 7:4,7,12 13:4 16:3 37:13,25 38:11 39:9,23 40:4 43:22 66:4 76:1
support 21:8 76:9,10
supporting 37:2
supposed 49:10,10 62:15 68:14 94:16
sure 4:16 28:20 33:21 36:15 73:15 74:3 76:17 83:16 93:10 98:2
surface 10:6 13:7 24:13,15 25:6,7 29:18 30:22 38:5 40:23 61:11 62:7 86:14 89:13
surprisingly 60:25
surrounding 62:25
survey 68:24 91:23
surveys 92:15,20
suspect 23:13,15 53:17 70:12 77:20
suspected 15:20 24:8 28:17
sustain 32:17,25 33:3 77:7
SVOC's 54:15
switch 40:8
sworn 99:8
synonyms 7:1,3
synopsis 33:12
system 23:11,22 24:11,25 25:7 27:14 31:5 40:12 41:14 44:2 86:2 87:13 95:19
systems 85:21 86:18 86:22
S-H-E-O-L-A 66:25
S-I-P-P-L-E 44:11

T

table 24:2 86:7,15
tail 73:5
take 3:11 4:17 24:25 33:1 39:19 42:14 63:13 70:1 74:15,20 76:15 82:3 85:2 86:12 88:7
taken 1:9 34:22 66:8 95:11 99:7
takes 39:20
taking 43:4 62:11 73:18
talk 4:2 6:1,16 16:9 17:19 40:9 96:15,17 98:3
talked 51:14
talking 5:22 32:5 42:24 43:5 56:19,20 63:4 65:18 67:12 86:16
Tamvina 71:19,22 75:2,14,19 76:11,16 78:7,14,18 81:4,7 81:14,16,21 82:4
tank 27:15
tanks 71:24
tax 50:6
taxpayers 49:5
TCE 6:21 7:2 10:9,24 11:6 13:18 16:18 18:5,21 19:10,16 26:18 27:12 28:25 29:11,23 30:1 31:3 31:6,12,14,16 32:2 32:14,24 33:1 40:18 40:18 41:16 54:19 55:8 71:2 76:20 77:3,5 78:4 89:3
TCE's 29:5 93:8
technologies 20:5,10 21:14 23:5
technology 23:6
teens 19:2 30:8
tell 2:12 5:14 55:23 55:23 63:22 64:3,10 84:24 90:2,4 95:25
tells 61:12
temporary 9:24 13:6 13:8
ten 76:2
tends 86:23
term 81:1
terminology 72:4
terms 26:3 55:19
test 59:21 84:22
tested 59:22 60:23
testimony 99:7
tests 10:2,11 54:14 92:25 93:5,17
tetrachloroethylene 7:2,3
thank 3:4,14,18,25 5:20 10:20 39:12 55:16 78:6 91:19 97:12 98:11
Thanks 36:22
their 16:16 37:23 47:7,19,20 52:1,11 52:19 69:8 70:22 74:25 75:3 80:11 83:18 94:17 96:19 96:24 98:5
themselves 2:12
thing 5:2,4 41:19 42:24 54:5 58:8 79:1 80:9 84:25 97:4,18
things 8:23 31:15 38:6 43:22 76:19 87:7 91:25
think 4:13 5:16 15:21 28:18 30:17 32:15 33:17 38:3 41:18 43:8,18 45:5 47:21 49:13 57:13,18,22 57:25 61:4 62:3 72:2,4 83:22 88:10 97:16
thinking 39:17 82:8
third 14:8 23:12 28:17 39:20
though 10:8 36:8 58:15 87:22
thought 3:24
thousand 61:3 76:20
thousands 85:15,16 86:17
three 8:13 16:12 23:11 26:13,16 27:12 33:14,24 40:17 42:9 46:17 69:25 74:10,13,22 74:24 80:16 83:4
three-week 88:11
through 5:8 7:13 10:16 13:11,25 17:23 19:5 21:5 25:2,6,10 27:21 30:18 32:4 45:10 51:5 65:20 72:11,25 74:14 80:17 85:2,20 92:4
throughout 29:15,23 30:16 57:6 76:1 80:3
throw 32:20
Thursday 1:11
ticked 62:17
Tile 12:18
Tilghman 1:24
time 2:2 5:10 7:6 8:2 9:25 27:8,22 31:12 31:18 32:1,4,22 39:10 41:9,17 42:8 45:14 55:24 60:19 69:18,23,24 78:11 79:23 80:14 90:12 90:19 91:4 95:25 96:10
times 42:9 64:23,24
today 71:21
together 4:23 59:10 67:21
told 81:21
ton 60:2
tonight 3:11,16,23 4:1,8,12 5:3 17:6,21 21:10 33:12 67:23

71:18 80:12 93:23 97:13,24
tool 43:11 58:9
total 9:19,21 10:4,6 24:6 26:23 32:14,23
totally 93:10
touch 4:20
touched 59:1,4
towards 56:11,12 58:5,7 60:17
town 43:25
towns 63:20 83:4
township 34:19 35:1 36:1 60:16 61:3 64:10 71:23 74:11 74:11 91:6,9,10,21 94:4
townships 82:21
toxicity 21:4
toxicologist 1:19 2:24 19:24
track 80:6
traffic 60:7
transcribed 5:1
transcript 88:5,11 99:9
transmitted 88:6
treat 38:1 40:19
treated 25:6 26:10,25 27:17
treating 22:6 24:5 25:13 38:16 39:8 40:10 43:17 61:15
treatment 7:6 11:5 21:5 22:3,4,7 25:7 26:11 27:14,21 40:8 41:25 45:17 56:20 71:16
tremendous 68:8,11
Trenton 63:3 65:7
trichloroethylene 6:25
tried 73:18,20
trigger 13:21
try 3:7 5:3,8 37:7 38:1 44:3 54:4 60:1 65:9
trying 4:19 44:21 66:9 70:8
Tubing 14:24
Tung 14:24 16:4,24
turn 5:17 16:8
turnaround 69:14
TVN 16:5
two 6:20 7:4 9:1 10:23 11:17 12:25 14:4 15:15 17:20 23:12 31:15 35:20 38:17 39:24 41:15 67:9 74:13 80:16
two-thirds 9:10
type 18:4 45:6 64:14
types 20:4,25 30:15 31:10
typically 92:13
T-A-M-V-I-N-A 71:22

U

under 28:19 46:16 55:5 74:17 99:17
underlies 39:25
underneath 14:9 23:13 24:9 77:24 95:15
understand 14:11 35:2 43:13 44:3 53:7 82:9 93:11
understanding 60:20 60:21 89:11
underway 84:11
undetermined 35:8
UNIDENTIFIED 56:14,25 57:7 58:2 58:20 68:15
unit 1:2 5:23,25 6:4,9 6:15 7:21 11:12 17:22 18:2,6,7,11 18:18,19,22 35:17 39:5 64:23 72:15,17 73:6
units 17:21 63:12 71:16 76:20
unknown 78:3
unknowns 77:17
unless 38:1 99:17
unlike 29:13
until 4:8 36:15 42:16 45:2 54:6,6 78:8 84:10 97:15
unusual 86:6
updates 79:16
upgradient 27:18
use 7:1 20:22 25:21 43:11 48:20 58:9 64:20 69:2,3 78:24 80:24
used 31:11,12 37:14 72:4
uses 20:23 69:9
USGA 69:3
USGS 39:1 60:23 68:24
using 26:12,25 27:6 51:25 65:19 90:17
usually 34:5 50:24
utilizes 28:5
U.S 1:6 40:2 53:15 68:24

V

vacations 33:16
vacuum 24:21,23 67:13
Valet 11:19 13:2 14:23 15:25 16:22
valley 1:2 2:22 5:23 11:7 12:6 29:16 40:24 58:3 62:4 70:13,19 86:4 94:8
valuable 68:14
value 87:19
Vannatta 7:5 16:2 71:3
vapor 18:17 24:20 72:16,18 73:15 74:4 78:25 80:20
vapors 24:22 25:4 81:20,25
various 60:6 92:24
vented 82:3
ventilation 81:19
venting 73:2 81:24
versus 31:16 41:20 41:24
very 3:18 6:8,22 9:8 9:11 13:15 16:1 26:20 32:6 40:11,11 40:12 42:15 45:9,10 53:10 57:16 59:3,5 59:14 67:4,4,14 68:1 69:24 70:4,4 71:20 77:9,24 78:22 81:15 86:6 89:12 97:12,13 98:12
viable 50:1 77:8
vicinity 14:9 61:16
view 70:17
Vikon 12:18
visits 9:1
vocational 3:22
VOC's 8:6,19 54:15
volatile 6:24 10:11 72:23 77:2
volatiles 74:18
volume 21:4
Vo-Tech 1:9

W

wait 80:22
want 17:15,18 41:6 43:20,21 51:3 59:15 59:15 66:23 69:1,11 76:3 79:23,25 80:1 81:25 85:7 95:7 98:2
wanted 3:14 10:21 15:3 38:22 43:7 46:6 59:24
wanting 83:17
wants 82:4
warrant 91:2
Warren 1:2,9 3:17 7:14 8:1 28:15 33:9 39:16,24 56:16 62:10,25 64:9 67:22 94:3
Washington 1:10 6:10 11:17,23 12:8 15:13 59:2,2,5 60:2 64:9 65:5,7,12 68:6 74:10,11 75:3 82:20

94:4
wasn't 75:14 81:8
water 6:18 7:4,7,7,12 10:6 13:11 24:2,3 27:16 30:23,25,25 31:8 37:17,18,25 38:11 39:8,10,23 40:4,4,23 43:14,16 43:22 56:21 57:16 60:22,22,24 61:2,6 61:7,9,19 65:21 66:1,3,4,5,7 70:9 71:3,5,22,25 74:11 75:4,9,21,25 76:1,4 76:7,8 83:25 85:1 85:19,21,24 86:2,3 86:5,7,11,12,15,19 89:1,5,12,20 91:8 91:10 93:17 97:3
way 12:9 42:6 43:17 45:23 57:18 64:4,16 73:16,20 76:2 78:9 83:15
ways 59:25 80:1,25
web 97:6
weeks 33:14,24
Weichert 36:25
Welcome 5:21
well 3:8 6:8 7:10 9:24 13:4,6,8,13,17 15:7 16:3 22:19 26:19 29:14,19 40:6 45:12 46:6,13 47:12 48:3 49:15 53:21 68:20 71:9,12 75:5,8,10 75:20,23 78:14 83:10 85:11,25 87:11 89:17 90:4,18 90:25 91:16 92:23 92:25 93:1,9,14
wells 6:18,20 7:4,5 9:15,16,23 10:1 12:16 18:15,15 26:14,16,23 27:13 35:4 37:13,23 38:1 38:13 39:9 40:16,17 40:21 41:15 56:22 59:20 66:3 71:10 75:3 79:3 83:18 89:18,22 90:12,21 91:11 92:24 93:1,6 93:7,8,19
well-known 62:1
went 10:15 30:21 42:9 52:15 61:11
were 2:4 3:15 6:20 7:4 8:10,15,22 9:1,1 9:6,11,14,16,16,19 9:22,23,23,24 10:7 10:8,23,24 11:7,7 11:16,22 12:5,6,24 14:1,4,18,22 15:6 15:10,16 16:13 19:18 23:9,11 30:14 31:11 38:9,23 39:6 48:11,13,13,15 49:10 55:1,20 67:4 72:9 73:6 75:3,12 75:15 76:5 82:20 89:18,19,20,22 90:21,22 91:17 96:7
weren't 43:16 94:20
we'll 4:20,22 5:8,12 5:13 43:9 55:13 58:8 68:19 79:20 93:21 98:10
we're 3:6 4:1,5,19 5:22 6:6,13 17:5,21 18:12,14,15,17,20 21:9 22:18,21,25 24:4,5 32:4 33:11 36:9,15 37:6,20 38:15 40:20,25 41:14 42:6,24 43:5 43:8 44:4,18 47:3 47:21 52:8 53:1,21 53:22,24 56:6,11,12 59:5,7,13 61:4 64:4 65:5,21 67:12,13,14 67:16 69:4,9 73:15 74:2,7,9,18 75:4,8 77:19 78:23 79:3,6 79:14 80:5 81:1 82:20 92:17 97:2
we've 5:25 54:6 65:3 67:1 80:4
whatsoever 38:10 45:17 74:2
while 44:21 81:1 85:14
whole 32:4 44:5 50:25 51:5 72:12,18 73:4
wide 11:14,21 19:13 19:14
willing 96:17
window 53:4
withdraw 40:14
withdrawals 57:16 58:13
withdrawing 59:16
witness 99:8
wonder 35:12
wonderful 3:19
wondering 39:17 40:1 91:1,22
work 3:2 7:23 9:2,4 17:19 18:12 40:6 48:8,24 52:6,8 57:5 61:23 65:10 67:21 68:3 79:6 81:6 87:15 97:1
worked 2:22
worker 96:9
workers 95:10,12 96:2,23,25
working 2:6,24 33:10 38:10 39:2 59:5 61:1 65:4 68:25 69:4 84:24
works 53:8
worried 46:1
worse 51:8 61:5
worth 87:3
wouldn't 5:5 41:1,5 45:1 81:16 83:20 84:9
wow 70:19
write 4:14
written 52:16,18
wrong 90:13

Y

yeah 51:24 71:13 78:17 91:12
year 32:17 33:2,2 49:11 51:2,10 62:17 70:23 76:21 77:10 79:12,12 85:13 87:10,12
years 27:23 33:11,11 39:19 41:10,20,20 41:25 42:10,17,20 42:20,23,23 43:2,8 43:9 53:16 61:3,18 61:20 69:16,24 70:3 70:3,13,15 76:6 77:18 78:17,17,18 78:18 79:13 87:5,5 87:7,8,10,20 88:1 89:19 90:12 95:11 95:21
yellow 12:3,4 15:4 26:7
yesterday 63:4 65:16
York 2:9 43:15 73:8
young 60:25 61:9
younger 61:7

Z

Zeller 66:18
Zelley 33:8,8,25 34:7 34:15 36:17,22 51:11,11,25 53:7,13 75:17,17,20 76:14
zone 29:7,11 93:19
zones 10:3
Z-E-L-L-E-Y 33:9

$

$10,000 76:6
$25,765,000 87:4
$46,840,000 41:9

1

1 1:2 5:23 6:4,9 7:21 11:12 18:2,18 35:15 72:18 73:6
1.5 87:4
10 16:14 31:3 49:11 51:1 61:20 70:12,15 74:5 76:6 78:18 87:3

100 24:3,16 26:22 29:5 31:19 73:25 85:24 86:2,5,19
104E 8:24
107 8:3,14 9:23
12 38:3 82:15
120 29:7
13 40:15,21
136 10:11 54:14
140 26:17 31:20
15 33:11 70:10
15-page 56:3
15-year 33:17
1500 13:13
152 9:18
16 9:4
1600 77:5,11
170 29:11
18 62:16 66:17
18104 1:24
1970 90:4
1970's 6:24 90:8,13
1975 90:4
1985 7:11
1988 7:13
1989 7:13,20 89:18
1990's 7:21
1998 91:8
1999 8:11

2

2 1:6 6:1,15 18:6,7,11 18:19,22 35:17 39:5 39:18 72:15
2,000 59:19
2,100 12:16 74:6
2.4 72:5
2.6 41:15
20 23:19 24:1,17 31:8 78:18 90:12
200 30:2 85:4
2000 17:23
2003 8:11 9:4 17:23 73:7
2005 1:11 99:1
21 10:5
22 39:21 41:10
23 75:22
25 12:22 44:17 63:11
25,760,000 41:24 87:18
250 85:13
26th 4:11
27th 4:10 97:15
286 9:22 10:4

3

3 39:18 40:5 68:10
3-year-old 70:23
30 29:3,6 34:5 87:7,8 87:10,20 88:1 89:19
300 85:5 89:2
31 6:11 11:10 12:9,21 14:25
310 33:1 76:21,23 77:8,12
32 43:1
3200 64:24
35 10:1
3500 11:14
366-7119 1:25
383 30:1
399 9:22

4

4 1:11 39:18 40:5
40 18:3 31:21
400 15:9 64:23
403 29:25
42 30:1
43 10:6
45 8:21 9:14,15
47 39:20 41:19 42:19 42:23 70:3 87:5

5

5 70:10
50 31:21
50's 30:18 89:17
500 11:21 12:12,14 12:23 26:8,10 30:6 42:4 85:11
5050 1:24
52 15:18
55 27:23 39:19 41:20 42:20,23 43:9 69:24 70:3
57 1:10 6:12 11:10 12:9,21 16:4 36:9 62:19,21 65:23
59 9:23

6

6 1:24
60's 30:16 89:17
610 1:25

7

7:00 1:11
70 29:10
70's 30:18,20 31:18 32:5 89:23
749,000 26:24
75 13:6
78 90:21

8

8 8:9 36:6 41:23 44:19 63:12 64:23
8,000 32:24
8,0000 78:4
80's 30:20
842 10:7
88 63:11

9

9,133 9:19
9:17 98:13
93 9:20 73:19
98 75:19

ATTACHMENT D

WRITTEN COMMENTS

PLANNING DEPARTMENT
COUNTY OF WARREN
SUITE 111
165 COUNTY ROAD, ROUTE 519, SOUTH
BELVIDERE, NEW JERSEY 07823-1949

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August 31, 2005

Mr. Stephen Cipot, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007

Dear Mr. Cipot:

I am writing on behalf of the Warren County Planning Board concerning the Pohatcong Valley Superfund Site Operable Unit One in Washington and Franklin Townships, Warren County. The Board appreciates that you have extended the public comment to September 26, 2005. Because attendance was relatively low at the meeting held on August 3, the board requests that another public meeting be held to discuss the proposed clean up plan. Attendance may have been low for two reasons. The first is that many people are away during the summer and may not have been able to attend. The second may be that the meeting may not have been advertised well enough. In order to ensure due diligence in reaching out to the public on this very important health issue, the Planning Board is requesting that an additional meeting be held before the EPA finalizes its clean up plans.

Thank you for the opportunity to comment

Sincerely Yours,

David K. Dech
Planning Director

njd
c: Steve Marvin, County Administrator

Q:\private\ndietz\dkd\05-24

8/1/05

FAX COVER SHEET

NJDEP

DIVISION OF REMEDIATION MANAGEMENT AND RESPONSE

TO: Stephen Cigott, EPA

FAX # _____

FROM: Lisa Sanders, NJDEP

PHONE # _____

FAX # (212) 637-4429

NUMBER OF PAGES INCLUDING THIS PAGE 5

NOTE: Oakridge Valley GW Contamination

FS Report + Proposed Plan (Draft)

NJDEP Comments

Murray, please acknowledge receipt

Steve

500357

TO:J 10:60 COOZ T AUG

XPJ

JUL 15 REC'D

State of New Jersey
Department of Environmental Protection

Richard J. Codey
Acting Governor

Bradley M. Campbell
Commissioner

MEMORANDUM

JUL 14 2005

To: Luis Sanders, Case Manager
Bureau of Case Management

From: DMK David M. Kaplan, Supervising Geologist
Bureau of Ground Water Pollution Assessment

Subject: Pohatcong Valley Ground Water Contamination Site
(1) Final Remedial Investigation (RI) Report
(2) Final Feasibility Study (FS)
(3) Draft Proposed Plan

(1) Final RI Report - My comments on the Draft Final RI were given in a memo dated July 7, 2004. Those comments have been adequately addressed in the Final RI.

(2) Final FS - My comments on the Draft FS were given in a memo dated April 23, 2004. Those comments have been adequately addressed in the Final FS.

(3) Draft Proposed Plan - My comments on the Proposed Plan were given in a memo dated July 7, 2005.

c. Tracy Grabiak

13469

Fax: HUG 1 2005 09:05 P.02

MEMORANDUM

TO: Luis Sanders, Site Manager, BSM

FROM: Carey Compton, Technical Coordinator, BEERA/EES-2

SITE: Pohatcong Valley Groundwater Contamination Site, OU1 Study Area
Washington Borough, Washington Township, & Franklin Township
Warren County, New Jersey

Document Name: Final Feasibility Study Report and Proposed Plan
Document Date: June 2005
Job Code: W220BY0S
Referral Date: 7/11/05
Date: 7/27/05

SUMMARY:

BEERA has reviewed the 6/05 dated Final Feasibility Study Report (FSR) and finds it conditionally acceptable. The EPA/consultant shall address BEERA's comments below that are based on the previous Technical Coordinator's comments dated 5/19/04, and review of the new text in 6/05-dated FSR. BEERA's comments dated 7/27/05 regarding the Final Remedial Investigation Report (RIR) contain a summary of the Site. The FSR focuses on three Areas of Concern (AOCs) within the American National Can (ANC) potential site area (PSA). The AOC's are defined as ANC areas A & B that contain TCE concentration levels above the NJDEP's Impact to Groundwater Soil Cleanup Criteria (IGWSCC) and a third suspected area ANC C located under the facility building. BEERA's comments on the FSR are as follows:

COMMENTS:

Section 1.5 – Nature and Extent of Contamination (p. 15) – The report notes that additional surface water and sediment investigations were completed, "but the results of risk evaluations concluded that no risks were associated with the chlorinated volatile organic compounds (VOCs) detected in these media. Therefore this section focuses on the soil and groundwater media, which is the focus of the remainder of the FS." BEERA agrees depending on the results of BEERA/ETRA's review of the ecological studies in the RIR.

Section 1.5.1 – Soil Contamination (p. 16) – This section refers to Figure 1-3, stating that the figure illustrates the distribution of TCE in soil at the ANC and AC1 PSAs. However, based on this Technical Coordinator's review of Appendix Q of the RIR, additional soil results exceed the Preliminary Remedial Goals (PRG's) that are based appropriately on the NJDEP's Soil Cleanup Criteria. For example, the Figure 1-3 does not include the highest ANC reported concentration level in soil (i.e., 400 ppm of TCE in

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soil sample 0531-738-PE01 (1.0-1.5' bgs)). Thus, it appears that the figure does not include any of the ANC's soil results. As per BEERA's comments dated 7/25/05, the EPA/consultant shall revise the associated Figure 1-3 and text appropriately to illustrate a more complete depiction of the soil results in access of the PRG's.

Section 2.4 – Contaminated Media Exceeding PRGs (p. 38) – Within this section and in Appendix A (p. 133), the quantity of contaminated soil is stated. BEERA does not necessarily agree with the statements because although the report notes the investigations of the PSA ANC, it does not include the results and sampling locations on the same map to identify and estimate the ANC ISRA Site's AOCs. Nor does the FSR (or the RIR dated 6/05) identify ANC ISRA Site's AOCs with the EPA/consultant's AOCs. For example, Figure 2-1 of the FSR illustrates the location of "Area B" as south and west of AOC-7 depicted on Figure ANC-1 of the RIR and Area A on the former does not appear to include AOC-17 of the latter. Thus, BEERA recommends revising the Remedial Investigation Report per BEERA's comments dated 7/25/05 and revising the FSR, accordingly. Otherwise, BEERA considers the statements questionable estimates of the amount of contaminated soil.

Section 4.1 – Development of Soil Media Remedial Alternatives (p. 67) – (a) There are three AOCs identified on PSA ANC that are briefly described in this section and more briefly on page 4 of the Proposed Plan. These AOCs, ANC A, and ANC B are located in the southwestern part of the ANC Site or under the southwestern part of the building as with the suspected ANC C. However, based on BEERA's review of NJDEP/ISRA documentation on the ANC PSA, another area beneath the northeastern part of the ANC building may is also a suspected source area per BEERA's Comment 11 dated 7/25/05. This are is where the Drain Lines 4 & 5 used to discharge and concentration levels of TCE in the soil slightly exceed the NJDEP's IGWSCC. Therefore, the EPA/consultant shall revise this section once the ANC/ISRA results are incorporated into the RIR, accordingly. In addition, depending on the total amount of contaminated soil a remedial option other than the current preferred option may be the best suited to protect human health and the environment. (b) Six soil alternatives (S#) are identified in the text of this section of the FSR. They are for soils as follows: **S1 = no further action,** S2 = soil cover, monitored natural attenuation and institutional controls, **S3 = capping and institutional controls,** S4 = **dual phase extraction (DPE) and shallow soil mixing,** S5 = in situ chemical oxidation (ISO), and **S6 = excavation and offsite disposal.** Section 5.0 provides an evaluation of the alternatives retained which are those in bold above. The associated Table 5-1 provides a "Detailed Evaluation of Soil Alternatives" under newly designated soil alternatives of S1 = no further action, S3 = capping and institutional controls which becomes S2, S4 = dual phase extraction (DPE) and shallow soil mixing which become S3, and S6 = excavation and offsite disposal which becomes S4. Therefore, of the 4 soil alternatives listed in Table 5-1, BEERA notes that S3 = DPE and shallow soil mixing has two significant implementation hurdles (i.e., to design storm water controls to reduce infiltration in target area and clay soil are not adequately fractured to achieve adequate air flow). However, within the Proposed Plan the EPA/consultant state that the preferred alternative is S3 down to 20' below ground surface for ANC A & C. Excavation and off-site disposal is proposed for ANC B. Given the lack of delineation and total known quantity of contaminated soil on-site, a soil remedial option is difficult for BEERA to recommend. In addition, according to the Federal Remediation Technologies Roundtable (FRTR) Agencies (EPA of which is a member & contributing agency) Internet Site, http://www.frtr.gov/matrix2/section4/4_41.html DPE's limitations are significant with respect to the ANC Site. Specifically, DPE target contaminants are light non-aqueous phase liquids

FAX:

(LNAPLs) of VOCs and fuels. TCE is a dense NAPL (i.e., DNAPL). In addition, the DPE technology is not recommended for "lower permeability formations due to the potential to leave isolated lenses of un-dissolved product in the formation." Given these significant limitations and possibility of additional source areas, the EPA/consultant shall revise the proposed plan to re-evaluate the soil alternatives, accordingly.

Section 6.0 – References (p. 130) – The twelfth reference is for the NJDEP's "Cleanup Standards for Contaminated Sites, N.J.A.C. 7:26D. Revised 2001" and the thirteenth reference is for the NJDEP's "Technical Requirements for Site Remediation N.J.A.C. 7:26E. Revised July 2000." As per BEERA's previous Comments dated 5/19/04, the EPA/consultant shall update and use these references and use the current NJDEP Soil Cleanup Criteria and Technical Requirements for Site Remediation. The current versions are as follows. The NJDEP "Technical Requirements for Site Remediation N.J.A.C. 7:26E were last revised on 2/3/03 and are available on the Internet at: http://www.state.nj.us./dep/srp/regs/techrule/. The most updated copy of the NJDEP Soil Cleanup Criteria (SCC) is also available on the Internet at: http://www.nj.gov/dep/srp/regs/scc/. The official NJDEP/SCC version was published in the 7/19/04 New Jersey Register. Should there be any discrepancies between the Internet text in the above link and the official version of the notice, the official version will govern.

Other – Indoor Air Pathway – The FSR and the Proposed Plan do not evaluate the volatile organic (VO) contaminated ground water to indoor air pathway. BEERA's comments dated 7/25/05 and previous comments dated 3/14/05 require the EPA/consultant to adequately investigate this pathway. In addition, BEERA/ETRA's recent comments dated 7/26/05 (attached to CM's paper copy) recommend the EPA/consultant to determine if remedial &/or other action is necessary prior to ground water remediation. The EPA/consultant's proposed "Summary of the Preferred Alternatives" for soil on page 15 of the Proposed Plan, notes the need for further characterization of soil source areas. Thus, specifically, the EPA/consultant shall include the groundwater to indoor air pathway as its own Soil Remedial Action Objective listed on pages 7 & 8 of the Proposed Plan and include it in the evaluations of alternatives of Table 5-1 of the FSR. Thus, BEERA is requesting the EPA/consultant address these comments, accordingly. To assist, the NJDEP's *Indoor Air Sampling Guide for Volatile Organic Contaminants* dated January 1999 and the *Draft Generic Vapor Intrusion Screening Levels* in the *Draft Vapor Intrusion Guidance* are available on the Internet at: www.nj.gov/dep/srp/guidance/vaporintrusion/vig_draft.htm. Based on the above comments, BEERA awaits a work plan on additional investigations and a revised RIR and FS/Proposed Plan based on the results of the work plan.

cc/6-05FinalFSRept.doc
c: David Haymes, (BEERA)
Dave Kaplan, (BGWPA)
Christopher Blake (BNCM)
Helen Dudar (BGWPA)

500361

jjflynn@comcast.net
09/26/2005 09:00 PM

To Stephen Cipot/R2/USEPA/US@EPA
cc Pat Seppi/R2/USEPA/US@EPA, Kim OConnell/R2/USEPA/US@EPA
bcc
Subject Re: Fw: Final Pohatcong PRAP

Mr. Cipot

We have had an opportunity to review all of the information that has been sent to us regarding the Superfund Program Proposed Plan for the Pohatcong Valley Groundwater Contamination Site Operable Unit 1 Study Area.

We have lived in Warren County for 15 years to date, 8 years in Washington Borough (OU1 area) and 7 years in Franklin Township (OU2 area). In your presentation at Warren County Technical School you had indicated to the public that the plan for OU1 was well underway. However, OU2 was the next phase to the project and was at the infant stage. It seems that OU1 had a very detailed plan laid out with specific timelines related to the remediation. The timeline however,was not related to calendar time. With this in mind, we would have the following comments.

1. We would like to see the same attention that was given to OU1, be given to OU2.
2. A more detailed calendar timeline be given with regard to the remediation.
3. We would be interested in possibly being involved in the testing of our property. We would need additional details as to the process.
4. We currently have a Superfund filtration system in our home and question whether OU2 should move toward conversion to city water. Is this being considered in the OU2 remediation plan?

Thank you very much for your quick response to both my wife Jean and myself from both you and the individuals working with you related to the project. Should you need any additional information or have any questions feel free to contact us by e-mail at jjflynn@comcast.net or home at 908-859-0361

Thank you again for your work to help clean-up the superfund site "Pohatcong Valley Groundwater Contamination Site"

Respectively Submitted;

Joseph E. Flynn and Jean Flynn

drg362@aol.com
09/26/2005 07:59 PM

To Stephen Cipot/R2/USEPA/US@EPA
cc
bcc
Subject Pohatcong Valley Groundwater Cont Site

Mr. Stephen Cipot- EPA Remedial Project Manager

Sir,

This letter is in response to the ongoing Superfund Program in the area in which I and my family reside. I live in the ou2 portion of the superfund area, known as the Edison Lake Development of Franklin Township. It is with great concern that I express my opinion that the agency continues to go forth and re mediate the groundwater issues as it has done in the ou1 area. The implementation of a remedy to rectify the contamination needs to continue for the health and welfare of our community. Please keep me informed as to any further progress or developments concerning this matter.

Sincerely,

David Guth

19 Quarry Rd

Stewartsville NJ

08886

drg362@aol.com

william rosebrock
<billrose1@verizon.net>
09/26/2005 09:16 AM

To Stephen Cipot/R2/USEPA/US@EPA
cc
bcc
Subject Pohatcong Valley Superfund Site

Greetings Mr. Cipot,

Attached as a Microsoft Word document are the comments of the Warren County Environmental Commission regarding USEPA's proposed remediation of Operable Unit 1 of the Pohatcong Valley Superfund Site.

Thank you.

William J. Rosebrock
Chair, Warren County Environmental Commission

908 454 4899 home

732 259 6237 cell PohatSuper EPA Comment 2005 09.doc

Warren County Environmental Commission
165 County Route 519 South
Belvidere, New Jersey 07823 – 1949
(908) 475 - 6532

September 26, 2005

Stephen Cipot, Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th floor
New York, NY 10007-1866
Telephone: 212-637-4411
email: cipot.stephen@epa.gov.

RE: Superfund Program Proposed Plan
Pohatcong Valley Groundwater Contamination Site
Operable Unit 1 Study Area
July 2005

Dear Mr. Cipot:

Following are the comments of the Warren County Environmental Commission (WCEC) regarding the cleanup mentioned above.

The New Jersey Department of Environmental Protection (NJDEP) has created a unique partnership with private law firms. This is known as the Natural Resource Damage Program, aimed at quantifying damages to the land, air, wildlife and drinking water, and then restoring these natural resources. USEPA over the years has compiled a mountain of data documenting such damages in the Pohatcong Valley Superfund Site.

WCEC asks that USEPA supply this data to NJDEP and urge NJDEP to immediately initiate a "Damage to Natural Resources" (DNR) suit.

USEPA data indicates that TCE and PCE contamination of the groundwater in the Washington Borough and Township may have begun in the 1950's or 1960's. Closure of private wells and filtration of the public water supply did not begin until the late 1980's, leaving a very long window of exposure.

WCEC asks that USEPA, in cooperation with the appropriate authorities, immediately initiate an epidemiology study to measure the health impacts of this exposure.

USEPA has identified Alcan, formerly American Can, as a source of the TCE groundwater contamination. Alcan's 2004 revenue was TWENTY FOUR BILLION EIGHT HUNDRED EIGHTY FIVE MILLION DOLLARS ($24,885,000,000). The highest level of cleanup discussed by USEPA would cost $57,240,000 over 30 years, or about 40 minutes' ALCAN revenue per year (see attached).

WCEC can find no economic justification for pursuing anything less than the highest level of cleanup.

Contamination has affected several thousand acres in the Pohatcong Valley Superfund Site (Operable Unit 1), and the contamination is spreading into Operable Unit 2.

WCEC asks that the EPA recommend to the Warren County Health Department that TCE testing be added to the permit requirements for any new wells within OU-2.

The State of New York has re-opened several remediated contaminated sites because of vapor intrusion. Recent studies indicate that Volatile Organic Compounds (VOC's) may be hazardous at levels below those previously deemed safe.

WCEC asks that USEPA immediately begin vapor intrusion studies in the areas closest to the contamination sources in Washington.

Since the late 1980's, many Warren County residents have been forced to cap their private wells due to water contamination.

WCEC asks that these people be compensated for their losses.

Thank you for your attention to these matters.

Sincerely,

_____

William J. Rosebrock, Chair
Warren County Environmental Commission

CC: NJDEP Commissioner Bradley Campbell
Warren County Board of Chosen Freeholders

Pohatcong Valley Superfund Site
Cleanup Costs

Excavation & Off-Site Disposal of Soils (SO-4) *	$	10,400,000
Capture & Treatment of Entire Plume (GS-4) *	$	46,840,000
Total Cleanup Costs	$	57,240,000
ALCAN 2004 Sales and Operating Revenues	$	24,885,000,000
ALCAN Revenues Per Day	$	68,178,082
ALCAN Revenues Per Hour	$	2,840,753
ALCAN Hours of Revenue Required for Cleanup		20.15
Years Required for Cleanup		30.00
ALCAN Hours of Revenue Per Year Required for Cleanup		0.67
ALCAN Minutes of Revenue per Year Required for Cleanup		40.30

Sources: USEPA Proposed Plan, Pohatcong Site, July 2005
ALCAN Annual Report 2004
Data Compiled by Warren County Environmental Commission

* These are the highest level cleanup options supplied by USEPA

Stephen
Cipot/R2/USEPA/US

08/23/2005 09:21 AM

To JMMoo11@verizon.net

cc KCavotta@Co.Warren.NJ.US, Luis.Sanders@DEP.State.NJ.US, Pat Seppi@EPA, Kim OCONNELL/R2/USEPA/US

bcc

Subject Fw: Time extended for cleanup input 8-21-2005

Dear Mr. Moore,

I received your telephone message of yesterday, regarding your request for the sampling of your residential well, downgradient of the present Pohatcong Valley OU1 Superfund Site boundary. Here is my email address, also as requested, and a local newspaper article on the site is below, as well. As you suggested, I see my email is incorrectly listed in the article, so hence your error message on sending an email to my address.

The EPA is not responsible for sampling residential wells or houses in your area, this is being handled by the NJDEP in conjunction with the Warren County Department of Health. EPA may sample several houses an initial part of the EPA's upcoming study effort, currently in the planning stage, but at present no residential well samplings such as you requested are planned. The NJDEP is responsible for sampling in the area we call the OU2 study area, and has been putting treatment systems called POETS on those potable residential water supplies when contamination has been encountered above health based levels in residential wells. This is as per the below article.

I am not aware that the NJDEP is currently planning to sample residential wells in the near future in your area, however, please contact Mr. Rocky Richards of the NJDEP to discuss your concerns and to determine if any samplings are being conducted in your area, or are in the planning stages. Also please know that both the NJDEP and Warren County Department of Health have recommended normal sampling schedules for homeowners to follow who have residential wells, and for these samplings and analysis costs are typically borne by the homeowner. In the event that during such a sampling contamination is encountered above a health based level, the NJDEP has a Spill Fund program whereby a homeowner may be able to be compensated by making a claim, and/or possibly for a POET to be installed. **Again, please contact Mr. Richard's office for the full and accurate details of how this program works. Mr. Richard's office can be reached at 609-984-2990.**

For the Warren County Department of Health, please contact Kevin Cavotta, at 908-689-6693, for information on sampling schedules. The WCDOH also coordinates with the NJDEP when local samplings are being conducted. Mr. Cavotta or Mr. Richards can also advise if any are planned for your area in the near future.

Please contact me if you need anything further. I hope this helps,

Stephen Cipot

212-637-4411

----- Forwarded by Stephen Cipot/R2/USEPA/US on 08/23/2005 08:38 AM -----

To

cc

Subject Time extended for cleanup input 8-21-2005

nj.com
Everything Jersey

The Express-Times

Time extended for cleanup input

Public has until Sept. 26 to weigh in on EPA proposal for Pohatcong Valle

Sunday, August 21, 2005
By ANDREA EILENBERGER
The Express-Times

Federal officials extended the public comment period concerning the proposed cleanup plan for soil and groundwater between Franklin and Washington townships.

The original deadline was set for Aug. 26, but the Environmental Protecti Agency will accept comments, concerns and questions until Sept. 26 before selecting a final remedy for the contaminated section of the Pohatcong Valley Superfund site.

Researchers presented their plan, which they expect to take 55 years and cost about $12.5 million to complete, during a public meeting earlier thi month when an area resident asked for more time to consider the plan.

"I think for the years of investigation (the EPA) did, the public needs more time to review the plan," said Robert Zelley, Pollution Control Financing Authority Chairman and former Mayor of Greenwich Township. "I want to be able to evaluate the various variables in order to validate their selection, in addition, my paramount concern is that they are putti effort into cost recovery."

Zelley, who is a hydrogeologist, said he made the request as a concerned citizen and not on behalf of the PCFA.

The public comments will be included in the EPA's final report detailing the proposed cleanup of the contaminated site, according to Patricia Sepp the EPA's community involvement coordinator for the project.

"The record of decision is a legally binding document, and we don't issue that until we have all the public comments," Seppi said. She expects the document to be issued by the end of September.

Researchers found groundwater and soil contamination in the superfund sit which is polluted with industrial solvents trichloroethylene, or TCE, and perchloroethylene, or PCE.

Under the proposed cleanup plan, most of the contaminated soil will be treated in place while some will be excavated and disposed of off-site, officials said. The plan also includes a system where groundwater is extracted, treated and then injected back into the ground.

Researchers identified three sites in the first phase as sources of the contamination, and the agency wants them to help pay for the clean up. Th former American National Can Co. was found to be a source of TCE. Pechine Plastic Packaging Inc. later took over the company before it was taken ov by Alcan Inc.

Researchers identified two dry-cleaning businesses, Modern Valet Service and L. and L. Econowash, as sources of the smaller and less concentrated plume of PCE.

The first phase of research included about a 1-mile section of Franklin Township that borders Washington Township, and researchers plan to contin the study in Greenwich and Franklin townships during the next phase of research.

"We want to define the nature and extent of the contamination," said Stephen Cipot, EPA remedial project manager for the Pohatcong Valley Superfund Site.

Samplings conducted by the state Department of Environmental Protection between 2003 and 2004 showed levels of TCE, and the EPA plans to tackle this area next to determine the scope of contamination, identify possible sources and eventually devise a cleanup plan.Researchers plan to set up monitoring wells to test for pollutants and will conduct vapor intrusion studies. Although there isn't a definite time frame for the work, Cipot expects it to begin sometime by the spring of next year.

Between 2003 and 2004, the DEP found levels of TCE in 50 Franklin Townsh wells and in 29 Greenwich Township wells, according to DEP spokesman Fred Mumford.

"What we were looking for and found was extensive contamination of TCE in Franklin and Greenwich," Mumford said.

The DEP installed Point of Entry Treatment Systems, or POETS, in contaminated homes. The system filters well water before it is pumped int the home.

"We were aggressive on the matter; we wanted to ensure residents had safe drinking water in the area," Mumford said.

(Public comments can be sent to Stephen Cipot, EPA Remedial Project Manager, U.S. Environmental Protection Agency, 290 Broadway, 19th Floor, New York, NY 10007. He can also be reached at 212-637-4411 or at

cipot.stephen@epa.mail.epa.gov.

Reporter Andrea Eilenberger can be reached at 908-475-8044 or by e-mail at aeilenberger@express-times.com.

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September 21, 2005

VIA FEDERAL EXPRESS

Kedari Reddy
Office of Regional Counsel
New Jersey Superfund Branch
U.S. EPA, Region II
290 Broadway - 17th Floor
New York, NY 10007

Re: Comments of Alcan and PPPI on RI/FS Pohatcong Valley Groundwater Site and Draft Proposed Plan - Pohatcong Valley Groundwater Site

Dear Ms. Reddy:

With this submission, we are providing comments on the above-referenced documents on behalf of Alcan and Pechiney Plastic Packaging, Inc. (hereinafter "PPPI"). As the owner/operator of the former American National Can (hereinafter "ANC") facility in Washington, New Jersey, PPPI has a particular interest in an accurate and fair Remedial Investigation/Feasibility Study (hereinafter "RI" and "FS" or "RI/FS") and Proposed Plan for the Pohatcong Valley Groundwater Site Operable Unit 1 (hereinafter "Site"). It is our expectation and understanding that the comments and attachments provided herein will be part of the official administrative record on the Site maintained by the United States Environmental Protection Agency (hereinafter "EPA" or "Agency") in accordance with 42 U.S.C. 9613(k). In addition, we expect that the reports on characterization and remediation of the former ANC property previously submitted to the Agency will remain part of that official record as required by that statutory provision.

General Comments
RI/FS and Proposed Plan

Having reviewed the June, 2005 RI/FS and the resulting Proposed Plan (July 27, 2005), it is clear that the EPA has constructed a house of cards based on inadequate data, assumptions and contradictory reasoning in selecting both soil and groundwater remedial approaches for the Site. Starting with the premise that the former ANC property is the source of all of the trichloroethylene (hereinafter "TCE") in the groundwater comprising Operating Unit 1

(hereinafter "OU1") of the Site, EPA "assumes" a 100 foot deep 16,000 square foot soil source under the former ANC plant building. In addition, EPA "assumes" a 100 foot deep 28,000 square foot source in Area of Concern 1 (hereinafter "AC1") and then "assumes" the former ANC plant is the cause of those conditions. Having "assumed" the existence of these soil sources, EPA then goes on to describe remedial alternatives for each in the FS. The Proposed Plan then adopts one of those alternatives for the Site ignoring the fact that the source areas are of assumed sizes and, in one case, ***is assumed to even exist.*** Consequently, the selected remedial approaches and costs presented in the Proposed Plan are not based on reality.

Each of Agency's assumptions is necessitated by EPA's failure to identify a current TCE source sufficient to support EPA's calculation of the total TCE mass present in the aquifer. EPA has concluded that 310 pounds of TCE enter the aquifer annually. EPA has also determined that the data from the former ANC property and surrounding properties does not evidence the presence of a sufficient TCE source to support that poundage figure. In fact, based on the actual data and, for purposes of these comments only, EPA's source size assumption, EPA has identified at most 14% of the TCE source in Areas ANC A and ANC B.[1] The location(s) of the remaining 86% to 98% of TCE source (depending on how TCE mass is calculated as explained in the comments on the FS modeling contained herein) is total supposition. No data exists to support EPA's conclusions as to 86% to 98% of the TCE source location(s). (*See* FS Appendix A, Table A-3 page 138).

Instead of concluding a source must exist elsewhere, or that their 310 annual poundage figure is incorrect, EPA has taken the novel approach of creating fictional soil source(s) with specific lateral and vertical dimensions so that it can continue to assert that the former ANC facility is the TCE source.[2] In relying on its series of assumptions, the EPA ignores such data as:

- TCE present in wells located a significant distance upgradient of the former ANC property that indicates the presence of a source of TCE contamination upgradient of the former ANC property;
- Low permeability subsurface soils and lack of perched ground water beneath the former ANC property indicating that TCE has not migrated vertically to the aquifer at the former ANC property;

---

[1] In fact, the TCE mass attributed to each of these areas is also assumed as opposed to identified by data. For example, Area ANC B is defined on the basis of one sample. An area can not be bounded using only one sample point. Similarly Area ANC A is given depth and east/west boundaries in the absence of any data. Therefore, even for these so-called identified areas, the extent of impacts is speculative at best.

[2] The necessity for EPA to make-up TCE source areas stems from the Agency's supposition that the plume is stable and therefore requires a certain annual influx of TCE in order to maintain its steady state. From this starting point, the Agency reportedly calculates the total TCE present in the plume over the 8.75 mile area. The Agency makes this calculation despite the lack of sufficient information about this complex karst aquifer and likely historical sources within the area. From that initial calculation, the EPA extrapolates a TCE poundage that must enter the groundwater plume each year. From there, it is a short leap for EPA to assume some source area exists.

- Data demonstrating a lack of TCE in deeper subsurface soils on the former ANC property again indicating that TCE has not migrated vertically to the aquifer at the former ANC property;

- Historical presence of industrial activities that may have been a source of TCE contamination such as an active railroad right-of-way, past operations at AC 1 and Vikon Tile, and operations and ultimately the filling of the former Morris Canal all in close proximity to the former ANC property;

- Possible alternative sources within the 8.75 square mile OU1 area including multiple areas which were not investigated such as Apple Orchard Dump;

- Presence of TCE in both overburden and bedrock wells within the plume area and lack of overburden ground water impacts and presence at former ANC property;

- Finding of 440 ppb of TCE in ground water from the southern portion of Washington Township in 1984 sampling indicating a source(s) in that area;

- Findings of broken rock and voids and fracture zones in various wells indicative of karst development and a complex, heterogeneous aquifer.

The Agency has also completed its proposed remedy selection without developing and using an appropriate three-dimensional ground water model that incorporates some of the acknowledged complexities of the bedrock aquifer to simulate fate and transport of contaminants. EPA has acknowledged the need for an appropriate model by asking the United States Geological Survey (USGS) to develop a model for this Site. Although USGS is in the process of developing and completing such a model, which would significantly improve the woefully inadequate model used by the Agency in the RI, EPA has proceeded to apply a simplified two-dimensional model to predict transport within the complex groundwater aquifer and to select a remedy based thereon. This is technically unjustifiable.

Not only has EPA oversimplified its analysis of the groundwater regime in the Pohatcong Valley, but the Agency has also skewed its risk and ecological assessments to promote its preconceived source and impact views. As a part of substantiating its TCE source view and proposed remedy, the RI incorporates human health and ecological risk assessments that summarily characterize significant risk estimates for metals and Polycyclic Aromatic Hydrocarbons (hereinafter "PAHs") found at several Potential Source Areas ("PSA") as not warranting further consideration. At the same time, EPA maximizes risk estimates for chlorinated solvents in groundwater by limiting the wells considered to those with elevated concentrations. In the FS, this manipulation then allows the pump-and-treat remedy targeting chlorinated solvents to appear to address the primary risk-driving exposures. In actuality, the risk reduction that can be achieved through this remedial approach, even if it were effective in this setting, is limited due to the continuing exposures to other contaminants, as well as apparent background exposures that were de-emphasized in the RI.

EPA guidance specifies that risk assessments should serve to characterize the nature and location of potential risks, not to substantiate a conceptual site model or remedy. In this case, the Agency is using risk assessment as a tool to selectively emphasize potential risks from chlorinated solvents in groundwater, even though drinking water in the area has already been addressed specifically to protect against chlorinated solvents. The risk characterization and risk assessment conclusions should be revised to evenhandedly consider potential risks from hypothetical future drinking water wells in context with the risks associated with known disposal areas at Potential Source Area(s) (hereinafter "PSAs") and probable background mineral characteristics of groundwater. As EPA guidance trumpets, judgment and specification about which risks are "important enough" to act upon rests solely with risk managers and policy makers; the role of the risk assessor in the RI is to characterize the various potential risks in a scientifically detached manner. EPA has not met its own required segregation of roles in this case.

In the Proposed Plan, EPA has selected a remedy for the Site which is estimated to cost approximately $13 million. It is clearly inappropriate and inconsistent with the National Contingency Plan (hereinafter "NCP") for EPA to move to a remedial decision when its RI/FS has not defined the actual source(s), but has instead assumed one and the dimensions of others, in order to allow the CERCLA process to advance. It is also *ultra vires* and inequitable to demand that a private entity spend millions of dollars to address this mythical contamination through a remedy doomed to failure since it is not designed to address the types of diffuse and disparate impacts that reflect the reality in the Pohatcong Valley. The Pohatcong Valley Ground Water Site Proposed Plan for OU1 is based on a construct of assumption on top of assumption until the total absence of data is forgotten and the ultimate assumption of source areas requiring selected remediation is asserted as truth.

OU1 Remedial Investigation Report
June, 2005

These comments are presented in page order rather than in order of their significance:

1) ***Pages 24 and 25*** – On page 24, EPA references the 1985-1999 Vannatta Street Well PCE concentrations as being as low as 7.4 parts per billion (ppb). However, the lowest concentration plotted on Figure 1.3a is approximately 30 ppb. The reason for this discrepancy is not clear.

2) ***Pages 48-50***, - The EPA describes a limited soil gas survey and how its results were used to winnow down the number of possible source areas subject to actual sampling. That soil gas survey was very limited in terms of numbers of samples taken per property, depth of sampling, and by the nature of the technology applied. Due to the fine-grained nature of most of the overburden materials found at the Site, soil gas is very limited in its effectiveness as a diagnostic or screening tool. In addition, the amount of actual environmental data was insufficient from a technical perspective to exclude the PSAs dismissed by EPA. Generally the Agency does not make decisions about potential contamination based on such limited surveying.

Certainly, suspect areas are not normally removed from further consideration based on such minimal screening, especially in light of the limitations of this soil gas technology under these geologic conditions.

3) ***Page 49, last full paragraph*** – EPA states that modifications were made to the test method used to reduce the sample analysis time. However, those modifications are not described so it is not possible to evaluate the validity of the modified methods adopted for this work. As listed on pages 70 and 71, some PSAs were eliminated without even this cursory level of investigation.

4) ***Page 50, second full paragraph*** – EPA notes that their contractor Performance Analytical was unable to replicate any of its field detections and Maryland Spectral Services was only able to confirm some. (emphasis added) Yet, EPA treats the data as valid throughout the RI. The inability to confirm results is dismissed, without evidence or adequate explanation, as due to losses during sample shipment.

5) ***Pages 61 and 62, under the heading Section 3.3.13*** - EPA states that ground water samples were collected from permanent wells "using EPA's low flow purging and sample collection method." However, a review of the recorded sampling depths and well construction details included in the RI shows that many of the wells were not sampled at the appropriate depth intervals indicated by EPA protocols. In addition, the length of screen used in many of the sampled wells, including some of EPA's monitoring wells, exceeded the recommended maximum length of ten feet. Therefore, the samples collected may not be representative of the actual groundwater quality beneath the Site.

6) ***Page 65, Section 3.4.7*** - EPA provides data collected from the OU2 portion of the Site in this section and in several other portions of the RI/FS. It is not clear why OU2 data are provided at this time in a report concerning OU1. To avoid confusion, EPA should consider removing the data and reserving it for another report.

7) ***Pages 82 and 83*** - EPA states that karst development is apparently more prevalent in the area of the Site near the Van Veldhuisen (hereinafter "VAN"), former ANC and Warren Lumber Yard (hereinafter "WLY") properties than elsewhere. The basis for this statement appears to be the presence of a broken rock zone in a well at VAN and of voids in a well at WLY. This section of the RI does not provide the basis for the identification of broken rock zones and voids and it is unclear whether this determination is supported by rock cores, geophysical logging results, video camera logging or other data. However, as EPA acknowledges in the same paragraph of the RI, sinkholes, a characteristic feature of karst, are found elsewhere in the Pohatcong Valley. The EPA also fails to note that many of the other wells in this area did not have extensive voids or broken rock zones, while some wells in other portions of the Site (e.g., near L&L Econowash and Red's Auto Body) did have voids or broken rock zones. Therefore, there is no basis in the data for the determination that this particular area has more karst development than other portions of the regional aquifer. Even if one assumes broken rock zones and voids were correctly identified, evidence from only two wells does not

provide sufficient data to conclude that karst development is greater in this area than elsewhere in the Pohatcong Valley.

EPA notes that the open borehole in the injection well on the former ANC property supposedly correlates with the voids detected in a well at the WLY property and the broken rock zone in a well at the VAN property. According to Figure 4-2, the elevations of the three supposedly correlated zones are 315 to 457, 330 to 405 and 303 to 434 feet above mean sea level (ASL) respectively. Although all three zones are in the same geographical area of the aquifer, the technical basis for the hypothesized correlation is unclear. Fractured bedrock, such as that found in the VAN well, is extremely common in the Pohatcong Valley regional aquifer. In fact, the prevalence of the fractured rock is the reason that the carbonate rocks function as an aquifer. Therefore, multiple fractures or broken rock extending over 130 feet may or may not be related to a series of voids in another well which extend less than 80 feet. The presence of three unrelated features in the same general area of the aquifer over similar, but not nearly identical depth ranges, does not, by itself, indicate any correlation or connection. Before EPA may rely on such a hydraulic connection (e.g. the presence of a fracture zone), geophysical, pumping or tracer tests would need to be conducted to demonstrate a relationship in that particular area of the aquifer.

EPA concludes that the "occurrence and distribution of voids in the bedrock. . . likely form a complex three dimensional, interconnected network typical of karst." Having drawn that conclusion, EPA then goes on to ignore it in its assessment of flow direction, calculation of TCE mass in the ground water and evaluation of remedial alternatives. All of these hydrogeological elements figure in EPA's conclusion about the total TCE in the plume, and therefore, the oversimplification of these aquifer characteristics undermines EPA's descriptions of plume stability and soil sources.

8) ***Pages 83 through 88, under the heading Section 4.3*** – in this Section of the RI, EPA uses ground water elevation measurements in the wells to calculate regional ground water flow. Although EPA acknowledges the complex, heterogeneous and anisotropic nature of the aquifer, its flow analysis includes an unstated assumption that the bedrock aquifer is one single homogeneous hydrogeologic unit. The possibility that some fracture zones and voids within the aquifer may flow in different directions than other fracture zones is not discussed or considered. Analyses by Environ International Corporation (hereinafter "Environ"), PPPI's consultant, of ground water flow near the former ANC property has shown that local flow patterns in this portion of the aquifer do not correspond to the simplistic regional pattern reported by EPA. It is likely that other portions of the regional aquifer also have localized patterns that vary from the regional flow pattern presented by EPA.

9) ***Page 84, second full paragraph and Page 94 – second bullet point*** - EPA makes the statement that perched aquifers were found at the former ANC plant. That is incorrect. As is true throughout these documents (RI/FS and Proposed Plan), the Agency disregards property boundaries and assumes the railroad property adjacent to the former ANC property, and AC1, are part of the former ANC property. Again, that is incorrect. These are independent properties,

each with its own operational history. Multiple borings by Environ and work by CH_2M Hill on behalf of EPA did not find any perched aquifers on the actual former ANC property.

10) ***Pages 89 through 94, under the heading Section 4.4, Appropriateness of Ground Water Model; Ground Water Model Application; and Ground Water Model Predictive Scenarios*** - EPA provides modeling results to characterize the ground water flow regime in the bedrock carbonate aquifer. EPA acknowledges that the bedrock aquifer is complex and on page 82 states that voids "...likely form a complex three-dimensional, interconnected network typical of karst." Despite the complexities of the hydrogeology and pumping test data showing that the aquifer is anisotropic and heterogeneous, EPA used a ground water model that simulated two-dimensional flow and assumed an isotropic and homogenous aquifer. In public meetings, EPA and USGS representatives working with the Agency have acknowledged that they are working on developing a more appropriate model that can simulate more complex conditions. The results of that model are not reflected or referenced in the RI. Since the aquifer is known to be complex, anisotropic and heterogeneous, it is technically unjustifiable to use a clearly too simplistic model in the RI/FS rather than the admittedly more appropriate and complex model that the USGS is completing. The USGS model is likely to be similar to, but more areally extensive than, the more complex model already developed and used by Environ to address the ground water fate and transport at and near the former ANC property (see Exhibit 1 hereto).

The data used to complete the EPA model was collected at the Dale Street well. Data from pumping tests at this well are then used to characterize the entire regional aquifer, despite EPA's repeated acknowledgment of the aquifer heterogeneity and complexity. Although appropriate wells are present in and around the assumed source area targeted by EPA, no aquifer parameter data were collected from them.

The flow patterns and capture zones predicted by the EPA based on the model do not correspond with known data concerning ground water flow and the known distribution of TCE in the aquifer. In particular, the flow patterns near the supposed source area do not correspond to known flow patterns in the area. The inferred capture zones are also not supported by the forward particle tracking data presented in the RI.

11) ***Page 56, Figure 4-2*** – The total depth and casing depth of the ANC injection well shown in this figure does not correspond with the information available to PPPI. EPA shows the well with a total depth of 242 feet below grade and casing extending from the surface to a depth of 98 feet below grade. PPPI's records indicate that this well was drilled to a depth of 350 feet below g

12) ***Page 110, first full paragraph*** – EPA used very limited, shallow soil gas and surface soil sampling to determine if properties were PSAs for either or both the TCE and PCE plumes. Clearly, EPA had concluded that these shallow soil conditions were indicative of subsurface impacts. Yet, in evaluating the former ANC property (which was sampled more than any other property within the Site), EPA ignores shallow findings and asserts that the non-detection of TCE at depths below six and a half feet at the former ANC plant, is not evidence that

deeper soils are not impacted.[3] On the former ANC property only, EPA believes the TCE was apparently leached through over eighty feet of intervening low permeability soils to reach the ground water while leaving no detectible trace behind in the predominately fine-grained soils at the former ANC property.

The Five Carp Company location is illustrative of EPA's inconsistent approach here. EPA knows that this property was the site of multiple lagoons and years of solvent use. EPA also knows that NJDEP required the closure of the lagoons. Yet, in assessing this location, EPA concludes that because it does not identify solvents in the shallower soils, the impacted ground water beneath the Site must be due to offsite sources. Groundwater impacts were found at this location in both overburden and bedrock wells. In addition, the concentrations detected were elevated over those in the other nearby wells. No consideration is given to the possibility that the impacted soils were removed as part of the NJDEP closure in 1995, that residual soil impacts may only be found at depth, or that these groundwater impacts may have occurred pre-1995, i.e. pre-source removal. Instead EPA simply dismisses this area as a possible contributor to regional impacts.

13) ***Page 110, Scenario C*** - EPA makes the statement that "elevated chlorinated VOC concentrations represent an on-going source whereas lower concentrations represent a historic source." That statement is a gross oversimplification of the possible variables involved in determining the concentrations of chlorinated VOCs found in sampled groundwater at a given time. For example, what was the starting concentration? If the groundwater was originally at saturation, but now shows 500 ppb it may be an older condition than a finding of a residual of 100 ppb if the original concentration were 110 ppb. This type of oversimplification of variables is illustrative of EPA's approach throughout the RI/FS and Proposed Plan.

14) ***Page 110, Scenario D*** - Under this scenario, EPA makes the assumption that if chlorinated VOCs are not detected in the soil, but are detected in the groundwater, the possible source area is no longer to be considered a past source for chlorinated VOCs to the regional aquifer. Given the small number of samples taken and the shallow depths sampled in relation to the regional water table, this statement is premature and too simplistic. In addition, if this assumption were applied to the actual data generated for the former ANC property soils, that facility would not be considered a source of TCE to the regional aquifer either. EPA has taken a clearly elementary and inconsistent approach with respect to soil findings. (*See* also comment 11 above.)

15) ***Page 110, last paragraph*** – EPA states that it is assumed that "migration of contaminants from soil to groundwater is the main migration pathway and that residual contaminant concentrations remain in soil source areas at detectable concentrations." Having reached that conclusion, EPA then disregards data from the former ANC plant that repeatedly shows TCE as non-detectable at depths below about 6.5 feet. For example, samples taken under

[3] One sample related to AOC 7 collected on adjacent railroad property did show a detection of TCE at 8.5 feet. However, as noted, that sample was not on the former ANC property. In addition, the 8.5 foot depth would still require the TCE to migrate through over eighty feet of low permeability soils to reach the regional aquifer.

the outside plant wall near AOC 7 showed no TCE. Despite this finding, EPA speculates that TCE found in AOC 7 is connected to a source beneath the southwestern corner of the building. The Agency also disregards multiple boring logs which demonstrate that no perched water was detected beneath the former ANC property. This inconsistent approach to Site assessment is applied only to the former ANC property throughout the RI/FS and Proposed Plan.

In this same paragraph, EPA alludes to "investigation constraints" that may have prevented contaminant identification in minor source areas. Those constraints are never defined. Considering that EPA found it necessary to create significant source area(s) near the former ANC property to "explain" its ground water calculations, perhaps the constraints noted are the better explanation of why identified source areas are not sufficient in EPA's view to explain the Site findings.

16) ***Page 113, last paragraph*** – There is a typographical error. The phrase "the data require" should be either "the data required" or the "data requires."

17) ***Page 122, Section 5.6.3, last bullet*** – EPA states that whenever the main contaminants of concern were not found in soils at a PSA, but were found in groundwater samples, that possible source area was concluded not to have contributed to the regional groundwater impacts. However, on page 100 of the RI, EPA states that a limitation of the RI approach is that historic soil source areas at a possible source property may no longer be identifiable due to contaminant degradation. Clearly, the dismissal of a PSA based solely on the very limited soil sampling done here flies in the face of EPA's own statement about degradation. Again, EPA has taken an inconsistent position in its own RI.

18) ***Page 123, last two bullets*** – EPA data summaries in tables and figures for the Site fail to show results for samples where contamination was not detected. This is misleading and confusing because it presents only a portion of the data and suggests that contamination was encountered throughout the study area. In fact, the absence of TCE at certain locations at or near the former ANC site (e.g., PVANC50 at AOC 16) is significant and contradicts certain EPA arguments in the RI/FS and Proposed Plan.

19) ***Page 124*** – EPA indicates that surface water was sampled at the former ANC property. In actuality, EPA reportedly sampled flow from a stormwater drain and from areas of surface flow during a rainstorm downslope from stormwater drains. This is not surface water as it is usually understood. There are no actual surface waters on the former ANC property.

20) ***Page 123, Section 5.9.1*** – In its description of past uses of AC1, the EPA identifies a "major interchange" of the Morris Canal, as well as railroad tracks and sidings. EPA reports that digging on this property may have found the track substrate still in place. Fill of unknown nature for the Morris Canal may be present on or adjacent to the property. Normally these uses would constitute "recognized environmental conditions" in ASTM parlance. EPA disregards them and attributes all soil impacts on AC1 to the former ANC plant. This attribution is made despite the lack of data linking conditions on the two properties. No satisfactory explanation for this skewed Agency approach is provided in the RI.

21) ***Page 134, first paragraph under Heading Phase 2*** – The EPA states that a bedrock well that was installed on the Vikon Tile property about 175 feet west of the intended location of the AC1 well is representative of groundwater conditions on the AC1 property. Given the heterogeneous nature of the aquifer and lack of knowledge about fracture patterns and flow in this specific area, this statement has no technical basis.

22) ***Page 137, Figure AC1-1 and page 164, Figure ANC-2*** – The swale indicated on these figures is not clearly defined in the field and consists of some minor erosional features caused by sheet runoff. Characterizing this area as a drainage swale is a misrepresentation of the actual physical features and drainage patterns in this area since it implies that flow has and will move at a rapid pace through a well-defined channel when no such channel exists.

23) ***Page 137, Figure AC1-1 and pp. 431 and 432, Figures 5-4 and 5-5*** – The definition of individual sites or properties in the area to the west and south of the former ANC property is inconsistent and appears to be designed to misrepresent the data. The Norfolk Southern Railroad property is not indicated on the map and most of this property is characterized as being part of the "ANC site." The other PSAs in this investigation are generally identified by property boundaries. However, the so-called "ANC site" has been singled out and defined to include large portions of the Norfolk Southern property. In some maps, the southern portion of the so-called "ANC site" is defined by a dashed line connecting Warren Lumber Yard with AC1. In other maps, this dashed line is absent. This inconsistent identification of site boundaries and failure to differentiate between the Norfolk Southern property and the former ANC site results in a misrepresentation of data collected on the railroad property as equivalent to data collected on the former ANC property.

24) ***Page 148, third paragraph*** – The EPA summary of the data provided in response to the 104(e) requests is technically accurate but fails to mention a clarification that was provided to the EPA in a subsequent meeting. TCE was incorrectly listed as a substance that was known to be used at the Plant. Small quantities of another chlorinated solvent (1,1,1,-trichloroethane) were used at the Plant and personnel inadvertently confused the two chemicals with similar names. Please correct the record to indicate that the current owners of the former ANC facility have no record of TCE use at the facility.

25) ***Page 149, second full paragraph*** – The EPA states that debris and disturbed areas were observed in the vegetated land on the southern portion of the former ANC facility. No evidence is provided to substantiate this comment and no data are provided concerning the type and nature of debris and disturbance. The southern portion of the property currently contains only minor debris near the edge of the parking lot and the only visible disturbance to this area appears to have been generated by recent investigational activities.

26) ***Page 150, first full paragraph*** – EPA states that two reports suggest that dumping occurred to the west of the former ANC property and in a swampy area south/southwest of ANC's railroad tracks. These two reports are not further identified. EPA did various site surveys at the former ANC property to determine if drums had been buried or if onsite disposal

had taken place and found no evidence of either. However, similar surveys were not completed on adjacent properties, including the Norfolk Southern and AC1 properties. Some statement as to the lack of support for these "reports" should be included in the RI if the reports are mentioned at all. In addition, reference should be made to the reports that other entities dumped drums on property behind the former ANC property, along the railroad right-of-way and in the swampy area at AC1. The EPA fails to investigate or discuss in any detail several independent reports cited in Appendix A that the former Tung-Sol Tubing dumped TCE and PCE wastes in this area. The EPA should also note in their discussion of the potential origin of this supposed source area (Section 5.10.1) that dumping was reported to have occurred in this area and that the known distribution of TCE contamination is indicative of surface dumping on the railroad and AC1 properties and does not support the proposed origin as surface runoff from the former ANC property.

27) ***Page 150, second full paragraph*** – Here the EPA seems to find fault with ANC because records of offsite waste disposal, which may have taken place decades before the RCRA requirements were in place, are not available. It is interesting to note that no such skepticism is applied to other possible source owners such as AID MODELS or BASF, who, according to the RI, stated they did not use TCE but provided no documentary evidence beyond their mere statements.

28) ***Pages 151 – 153*** – On these pages, EPA summarizes some of the investigatory and remedial work already completed on the former ANC property. While the EPA highlights the localized detections of TCE in certain soils, it fails to note that soil samples were taken to define the vertical and lateral extent of these TCE detections. Despite the collection and analysis of a number of samples that were analyzed for TCE from a depth of greater than 6.5 feet, no TCE was detected in any samples collected on the property at a depth below 6.5 feet[4]. EPA offers no credible explanation as to how TCE moved through approximately ninety feet of admittedly low permeability soils to reach groundwater, leaving no detectible concentrations in those intervening feet.

29) ***Page 152, third paragraph under Heading AOC-7*** – EPA states that post-excavation sampling in AOC 7 did not confirm the removal of contamination on the eastern side of the excavation (i.e., adjacent to the building). However, the post-excavation sampling included several samples along the eastern edge of the excavation and near the building foundations. TCE was not detected in these samples at concentrations above the most stringent New Jersey Department of Environmental Protection (hereinafter "NJDEP") soil cleanup criterion. Therefore, confirmatory sampling showed that the surficial organic impacts in this area, which were removed, did not extend under the building.

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[4] One sample related to AOC7 collected on adjacent railroad property did show a detection of TCE at 8.5 feet. However, as noted, that sample was not on the former ANC property. In addition, the 8.5 foot depth would still require the TCE to migrate through over eighty feet of low permeability soils to reach the regional aquifer. There is no evidence of such migration.

30) ***Page 155, top of page*** – EPA refers to PVANC39 and PVANC32 as showing perched water is present on the former ANC property. These monitoring wells are not on the former ANC property; they are both on adjacent property owned by the Norfolk Railroad. The RI/FS is strangely silent as to the presence of this once active railroad right-of-way through the Site, just as the RI/FS does not consider the filling of the Morris Canal Channel with unknown materials. The Norfolk Railroad is topographically lower than the former ANC property and therefore the two areas may not be assumed to have the same perched water features or other subsurface conditions. Wells actually on the former ANC property have not identified any perched water.

31) ***Page 156, first paragraph*** – EPA acknowledges that no chlorinated volatile organic compounds, including TCE, were detected in surface water samples collected from a "concrete discharge structure or from an unlined pit in January 2002." However, the water from the discharging end of a concrete pipe (Sample PVANC52) did contain TCE at 25 ppb. PVANC52 is not on the former ANC property as the RI states. Therefore EPA's implicit conclusion that TCE detected at this point is perforce from the former ANC property is not necessarily correct. The fact that nothing was detected in the upslope sample at PVANC50, which is on the former ANC property, may be indicative of an alternative source for the detected TCE. As EPA acknowledges in its discussion, the source of contamination appears to be soil within or near the concrete pipe, which is located on the railroad property. No credible explanation is provided for the apparent continued presence of TCE in soil on the Norfolk Southern railroad and AC1 properties and the relative absence of TCE on the supposed source areas upslope from these properties. It is unclear why the Agency does not consider direct dumping of TCE on the railroad property (as was reported by several sources cited by the EPA) as the most likely explanation for the absence of TCE in the upslope areas and its presence at these two properties.

32) ***Page 156, third paragraph*** – The EPA summary of the soil data is misleading at best since it fails to distinguish between data collected on the railroad property and the former ANC facility and does not note the number of samples with no TCE or trace concentrations in the supposed source areas. An example of the misleading presentation of the data is the fact that 15 (not 10) samples were collected from the 5 borings cited in this paragraph and the range of concentrations was actually 0.007 mg/kg to 13 mg/kg (not 1.1 mg/kg to 13 mg/kg). The arithmetic mean of these sample concentrations is 1.69 mg/kg, marginally above the most stringent NJDEP cleanup criterion of 1.0 mg/kg.

33) ***Page 156, fourth paragraph*** – Based on results from PVANC39, EPA concludes that TCE in soils beneath the former ANC property extends to a depth of 80 feet. However, as noted above, PVANC39 is not on the former ANC property but was taken from a location topographically lower than the former ANC property. Therefore, findings from PVANC39 cannot be used to characterize the subsurface at the former ANC property. The detected concentrations below the surface are also all well below the most stringent NJDEP cleanup criterion of 1.0 mg/kg and are, therefore, considered by the NJDEP to be insufficient in magnitude to be a source of groundwater contamination. In contrast, soil samples actually taken

on the former ANC property which PPPI has provided to the Agency in the past demonstrate that no TCE detections were found in subsurface soils below 6.5 feet. In addition, sampling on the former ANC property and in drainage areas does not support a connection between AC1 conditions and the former ANC property.

34) ***Page 143 and 181*** – On each of these pages, EPA states that a private entity reported that they did not use TCE and EPA accepted that statement. However in reviewing the information provided about the former ANC operations based on interviews with current and past employees, EPA dismisses the lack of knowledge on TCE use as if it has no credibility. The contrast in EPA attitude is noteworthy.

35) ***Page 314, under the heading "Conclusion"*** – The EPA concludes that the Tung-Sol Tubing/Pohatcong Hosiery area is "considered a contributory source of chlorinated VOCs to the Pohatcong Valley Groundwater Contamination Site." Yet for the remainder of the RI/FS and Proposed Plan, the former ANC property is viewed as the sole source of TCE to the regional aquifer. No explanation is included as to why the Tung-Sol property is not retained as a TCE source, especially given the report of its significant TCE use, past dumping, both on its own property and behind the former ANC location, and findings of TCE in soils and groundwater at the Tung-Sol property.[5]

36) ***Page 328, Section 5.9.26*** – EPA has stated that the groundwater flow direction in the Site is to the southwest. Therefore, looking at a map, the VAN location is upgradient of the former ANC plant. Monitoring wells on the VAN site produced TCE detections of 64 parts per billion (hereinafter "ppb") and 16 ppb. EPA attempts to explain these upgradient detections away by attributing the impacts to mounding from the former ANC re-injection well. However, as the attached modeling report demonstrates (Exhibit 1), the re-injection well on the former ANC property does not produce such mounding. In addition, EPA has not demonstrated the hydraulic connection between the deep overburden well in which TCE was detected at VAN and the former ANC property bedrock re-injection well. The fact is, there are TCE groundwater impacts upgradient of the former ANC facility. Groundwater entering the former ANC plant is already impacted with TCE before it passes the northern property boundary. EPA has not adequately investigated the origin of these impacts as part of its RI. This is especially true given statements in ICF Kaiser's (EPA's own consultant) Industrial Survey Report of 1997 that numerous drums were dumped on the VAN property and in a ditch on the north end of this property. ICF Kaiser's Report also notes the presence of two abandoned, rusty tanks on the property. Based on the data collected concerning the past use of this site, EPA's collection of one soil sample from the surface at this property is clearly inadequate to characterize the potential for discharges of contaminants at this site.

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[5] In the public meeting, EPA mentioned that Tung-Sol was not retained as a PSA because no currently viable entity could be found to take responsibility for the property. Lack of a viable PRP is no basis for elimination of a PSA as a source of regional groundwater impacts.

37) ***Page 340, Section 5.9.28*** – As was done with the AC1, EPA assumes that any TCE found beneath the Vikon Tile property is attributable to the former ANC plant. This assumption is made despite the fact that EPA has concluded groundwater flow is to the southwest so Vikon is cross-gradient, not down-gradient, of the former ANC property. The Vikon Tile property was home to a synthetic yarn manufacturing and a yarn-making machine company. More recently, the property has been used by Vikon Tile to make enameled steel and aluminum wall tile. Anecdotal information reported liquid waste was dumped onsite and historic aerial photographs showed probable waste lagoons adjacent to this site just to the east of the railroad tracks. (*See* Exhibit 2) Recent site assessments completed by Washington Borough show that the facility maintained a waste holding pond and discharged wastewater through a pipe under the railroad tracks to a location on the AC1 property that is immediately south of one of the source areas identified by EPA. In addition, the Vikon property assessment describes a six foot deep drainage vault on the Vikon property, upgradient of the well with EPA's highest TCE reading. No sampling at this apparent waste vault was done; no consideration of this vault as a possible TCE source to groundwater is reflected in the RI or the Proposed Plan. Despite evidence that Vikon's industrial practices discharged wastewater near one of the identified source areas, EPA took a limited number of soil samples at only the corners of the property and found low levels of TCE in one location and other chlorinated solvents in others. TCE was found in the groundwater at the highest level found in OU1. Despite this information, EPA did not take additional soil samples to adequately characterize the property. Instead EPA concludes that Vikon is not a source of groundwater impacts. In addition, EPA persists in attributing the impacts at AC1 to the former ANC property even though the Vikon property operators actually piped their liquid waste to the area of AC1. As is true of many of the EPA-identified PSAs, a paucity of data is used to prematurely eliminate the property as a source of impacts to groundwater and AC1.

38) ***Page 393, Section 5.9.34*** – The Washington Mechanical property is located northeast or upgradient of the former ANC property. As reported in the RI, 130 ppb of TCE was found in groundwater at this location. Given its distance from the former ANC property, EPA can not attempt to dismiss this finding by alluding to ground water mounding. Therefore EPA simply ignores it. Again, the data clearly demonstrates that TCE is entering the Site groundwater from upgradient of the former ANC location.

39) ***Page 405-406, last paragraph on p. 405 and first paragraph on p. 406*** – EPA reports that it found TCE in nine of twenty sediment samples from Pohatcong and Shabbecong Creeks and in seven of twenty water samples from these creeks. EPA also reports that there is no discernible pattern to these detections. Neither of these creeks is near the former ANC property. Further, the distribution of detection speaks to the possibility of multiple TCE sources as opposed to one source. EPA has made no attempt to analyze these data to determine if the distribution is indicative of additional source areas.

40) ***Page 412, second bullet*** – EPA states that PVAC106 is located near the upgradient property boundary of AC1 with ANC. The analysis of groundwater flow by EPA indicates that flow is from the northeast to the southwest. Therefore, since AC1 is about 10

degrees east of south from the former ANC property, AC1 is more accurately described as side-gradient from ANC. Portions of the ANC property are upslope from AC1, but the sample location in question is actually on the Norfolk Southern Railroad property and is downslope from AC1, ANC and the Warren Lumber Yard. EPA's continued use of inaccurate descriptions of the local properties and topography (e.g., assigning this sample to AC1 when it is located on the railroad property) provides a confusing picture of the data. It also leads to the incorporation of incorrect conclusions in the RI/FS and Proposed Plan.

41) ***Page 412, first full paragraph*** – EPA either fails to understand or misrepresents the soil data collected at AOC 17 adjacent to the former ANC property as part of the NJDEP Industrial Site Recovery Act (ISRA) investigation. TCE was detected in one sample at a concentration above the most stringent NJDEP cleanup criterion. Subsequent excavations in the area removed this small area of soil contamination that was at a depth of about 8.5 feet below grade. Post-excavation samples collected at about 10 feet below grade showed no evidence of contamination and the area was given a designation of no further action (NFA) for soils by the NJDEP. This area has been fully characterized and remediated and is clearly not a source of TCE contamination to the groundwater. Despite the EPA's incorrect description by EPA in this paragraph of the contamination that was remediated in this area, EPA apparently agrees that this is not a source because it has not been included as one of the source areas evaluated in the FS or requiring remedial action in the Proposed Plan.

42) ***Page 412, last full paragraph*** – EPA concludes that stormwater flow from the former ANC facility likely introduced TCE into the supposed AC1 source area because the highest TCE concentrations were detected in samples (e.g., PVAC106 and PVANC26) collected from a drainage swale between the former ANC property and AC1. As previously noted, these samples are not in a drainage swale and are not between the former ANC property and AC1. They are located in a flat lying area, not a swale, on the Norfolk Southern property between Warren Lumber Yard and Vikon Tile to the west and the former ANC and AC1 to the east. The conclusion that TCE originated from the ANC facility based on the location of the elevated TCE concentrations in soil on the railroad property has no technical merit. If the contamination was derived from stormwater drainage from the former ANC property, TCE would be detected at significant concentrations in the soil on the former ANC property between the storm water outfall and the location on the railroad property where elevated concentrations of TCE were detected. Since TCE has only been detected at trace concentrations or not detected at all in samples collected on this portion of the former ANC property, the proposed scenario for the introduction of TCE to AC1 is not supported by the facts. The facts suggest that dumping on the railroad is a more likely explanation for the distribution of TCE in the soils.

43) ***Page 412, last full paragraph*** – The sample identified as PVANC29 appears to be incorrectly designated. The actual sample with the concentration reported here is PVANC49.

44) ***Page 413, last paragraph*** – The suggested scenario of contamination originating through stormwater flow from the former ANC facility is not supported by the data collected at the former ANC property. Sampling in the areas of the former ANC facility immediately

downslope of stormwater outfalls shows that TCE was present in trace concentrations or not present at all in soils in this portion of the former ANC facility. As EPA acknowledges in its discussion of possible contaminant migration in the environment, it is technically infeasible for TCE in stormwater to flow over soils without a significant portion of the TCE migrating downward into the soil and being adsorbed. Clearly, if the soil on the railroad property retained TCE at elevated concentrations, soil in the upslope areas that are assumed to be the source of the TCE would also have retained significant TCE concentrations. Therefore, the absence of significant TCE in the soils where stormwater flowed at the former ANC facility is strong evidence that the TCE on the railroad property did not originate on the former ANC property as EPA assumes.

45) ***Page 414, third full paragraph*** – EPA concedes that it is likely that there is a source of TCE located upgradient of the former ANC facility, but insists on arbitrarily stating that the source is minor based on the limited groundwater data cited in this paragraph. However, the Agency fails to note that TCE was detected in ground water samples upgradient of the former ANC facility at concentrations as high as 130 and 230 ug/kg. These concentrations are of a similar magnitude to those detected at and near the former ANC site and are generally higher than those detected at the municipal drinking water well (Dale Street Well) that is downgradient of the area. In its failure to mention the higher concentrations of TCE detected in these wells and its focus on one relatively low concentration, EPA misrepresents the data to skew the results to fit its preordained conclusion that the upgradient sources are minor. The Agency also attempts to dismiss the presence of elevated concentrations of TCE on the property immediately upgradient to the former ANC property with an unsubstantiated argument that the ANC injection well caused contamination to flow upgradient to these wells. EPA does not provide any technical support for this argument and its own limited modeling data do not support it. Limited modeling conducted by Environ indicates that the mounding effect from the ANC injection well is insufficient to cause migration of contamination to these upgradient wells from the former ANC property (*See* Exhibit 1 hereto).

46) ***Pages 434 and 435, Figures 5-7 and 5-8*** – In these figures, EPA provides TCE results for ground water samples that were ostensibly collected in 2000 and 2002. However, not all of the data on each figure was collected in the year stated on the figure. Some of the data was collected as early as 1999. Since ground water is not static and concentrations may change over time, each result should be presented with its correct date. Data from one year should not be used to characterize conditions during other years.

47) ***Page 444*** – The habitat description is limited to a listing of expected species throughout the Upper Delaware Watershed. First, for an ecological risk assessment of this scope with the diversity of areas, a habitat characterization completed in the office is insufficient. Field reconnaissance and species/habitat checklists should have been completed. Second, the site-specific habitat characteristics turn out to be ultimately important for characterizing the potential of soil exposures around the developed industrial facilities. Therefore, descriptions of the habitat areas and ecological setting around each of the PSAs included in the assessment should be included.

48) ***Page 445*** – Screening of groundwater as an exposure medium for ecological receptors should be eliminated. As the text points out, groundwater is only relevant for ecological receptors where it can be discharged to surface water and potentially affect sediment. Where direct evaluation of surface water and sediment is included, as in this assessment, potential groundwater discharges are accounted for and consideration of groundwater as a separate, ecological exposure medium is unwarranted.

49) ***Page 448*** – Data should be grounded and evaluated based on contiguous or linked ecologically relevant habitat units, not the artificial boundaries of the PSAs. EPA should re-do the RI ecological assessment to reflect the actual Site environment.

50) ***Page 449, second to last paragraph*** – EPA states that Figure 6-5 identifies 12 sampling locations along Shabbecong and Pohatcong Creeks that are included for evaluation and three discharge locations associated with PSAs, only one of which is pertinent to the former ANC facility. However, Figure 6-5 actually shows 20 samples which are classified for inclusion in the "SAC" grouping for surface water and sediment and no locations classified for ANC or other PSA groupings are shown. Further, the sediment and surface water tables developed for the SAC area do not match either the text or the figure since 8 samples are included in this category and analyzed. The former ANC facility is located almost a mile from a surface water body and it is not appropriate to specify a data grouping as "ANC Surface Water" based on the locations actually sampled (e.g., stormwater drain outfalls). The specific samples included in this category are not identified, though there are apparently 5 samples according to Table ERA-14. The samples included in each grouping should be clearly specified. These entries in the RI assessment need to be clarified and corrected.

51) ***Page 449, last paragraph*** – EPA states that seven PSAs are included for evaluation, however only six are subsequently listed. No explanation is given for this discrepancy.

52) ***Page 450*** – If duplicate samples meet data quality and QC objectives as actual duplicates, the resultant detected values should be averaged. Selecting one of these values as EPA has done, contradicts the QC premise that duplicate measurements reflect sample handling and measurement uncertainties. Likewise, where both of the duplicates are "non-detects," the detection limits should be similar and should be averaged. If detection limits vary widely for duplicate samples, this is an indication that the samples may not meet QC requirements and data validation should be revisited.

53) ***Page 452*** – The specification that ecological risk considerations beyond initial screening are limited to chlorinated VOCs is 1) not consistent with EPA guidance, 2) ecologically inappropriate, and 3) not, in fact, followed in the assessment. First, EPA guidance does not make provision for selecting ecological risk chemicals of potential concern (hereinafter "COPCs") on the basis of chemical class (*i.e.,* chlorinated VOCs), or eliminating other constituents identified as potentially significant in screening due simply to their chemical class (*e.g.,* metals and PAHs). It is possible that metals exposure at some of the PSAs, which are

developed industrial facilities with disturbed habitat, could ultimately be characterized as representing a limited population risk. However, per EPA guidance, such a determination must be made location-by-location based on site-specific details after Step 3 of the ecological risk process, not by summarily eliminating, by virtue of their chemical class, COPCs that screen into the process.

Second, in comparison to some of the metals and PAHs eliminated from further consideration, chlorinated VOCs are typically considered of very limited ecological relevance. Due to their volatility, they are not persistent. They are also extensively metabolized and are not transported through the food chain. Some of the very constituents subjectively removed from consideration are much more likely to have been toxicologically relevant.

Third, though the section specifies that only chlorinated VOCs are considered beyond initial screening and the subsequent risk characterization text discusses only the chlorinated VOCs, in actuality metals, PAHs and other constituents were included in the risk assessment tables for quantitative risk estimation. The analyses were completed and make it readily apparent that the hazard quotients for constituents other than chlorinated VOCs dominate the potential risks and would require the most involved subsequent consideration. Selecting only the relatively low chlorinated VOC risks for emphasis in the body of the RI document is scientifically inappropriate based on the calculated risk estimates and appears to be an attempt to substantiate the pre-determined perception that chlorinated VOCs represent a uniformly significant issue in the Pohatcong Valley. The preliminary ecological risk assessment results actually demonstrate that there are differing constituents and differing habitat/population characteristics across the PSAs and evaluation areas. The Agency RI conclusions should not try to avoid such complexities in order to substantiate the expected "effectiveness" of the proposed remedy for risk management.

54) ***Page 473, et. seq.*** – In the summary statistic tables, the means computed as representative of average concentrations in the exposure unit are frequently much higher than the maximum concentrations found in the same area. This is statistically incongruous and the mean value should be "capped" at the maximum concentration. If this situation is a result of data quality problems, these should be acknowledged and discussed.

55) ***Page 533*** – The "maximum HQs" shown in Table ERA-27, characterized as relating to the former ANC facility surface water, are computed incorrectly based on the maximum and screening values shown in the table. Further and as stated previously in Comment 19, there are no surface waters *per se* on the former ANC property.

56) ***Page 542*** – The evaluation of groundwater in the human health risk assessment is specifically constructed to include only those wells with TCE and/or PCE concentrations greater than 1 ppb. It is inappropriate to exclude, as a matter of the study design, wells with low concentrations of constituents from analysis. This manipulation serves to increase the concentrations within the groundwater which are inappropriately viewed as "representative."

57) ***Page 542*** – Evaluation of individual domestic supply wells for which alternative water supplies have been provided through the typical Superfund risk assessment method is inappropriate from a technical perspective and inconsistent with EPA guidance. These wells should be excluded from the area-wide hypothetical risk evaluation and, if their use remains a question, they should be evaluated by the responsible public health authorities using relevant state drinking water criteria. Individual drinking water wells represent specific exposures to identifiable individuals, not hypothetical exposure scenarios to an unknown population, and they should be addressed accordingly. Including them in a Superfund-type risk assessment misleads reviewers, particularly those who might be the users of such wells, to conclude that the health risks to particular individuals can be determined through this type of study. Superfund risk assessments characterize hypothetical risks to populations assuming certain consistent lifetime or long-term exposure characteristics and the receptors reflect the most sensitive individuals to potential effects. This is not an individualized risk characterization. Domestic drinking water is the province of real health professionals that can evaluate immediate exposures and make short-term recommendations, not environmental cleanup specialists that use risk assessment methods designed to characterize the probability of risks to a population and develop 50-year cleanup plans. EPA's site investigation team should not play doctor with regard to the health of individuals and should not attempt to provide reassurances, or demonstrate immediate health threats, using the Superfund risk assessment paradigm.

58) ***Page 545*** – The calculation of risk estimates on the assumption that any remedy emerging from site investigation has not yet been completed is consistent with EPA guidance on baseline risk assessment. However, there is an important caveat, that should be clarified and discussed with regard to sampling data are included in the assessment. Risk assessments must reflect current conditions. Results from areas of soil that were removed as part of previous actions must be excluded since, by virtue of being removed, it is not possible for ongoing, long-term exposure to occur. The text should be expanded to clarify, and samples should be excluded as necessary, to specify that the risk assessment does not assume subsequent remedial actions are to be implemented, and that the risk assessment does not include results from soil, sediment or groundwater that no longer exist in the area.

59) ***Page 546*** – USEPA Data Quality Objectives (hereinafter "DQOs") for risk assessment support excluding screening level groundwater results obtained from temporary wellpoints, particularly where extensive data from properly constructed wells is available. Accordingly, excluding results from temporary wellpoints was correct, since higher data quality results are available to supersede the screening data. However, selectively retaining the screening result from one single wellpoint (PVLNL04-WP-1) simply because it is the highest number noted is not appropriate and flies in the face of the DQO requirements. Taking the position that wellpoint data is of insufficient quality except for the very highest number available is not scientifically defensible, represents a self-contradictory approach, and is inconsistent with EPA requirements regarding DQOs. This sample should be excluded along with the rest of the wellpoint data.

60) ***Page 551 and 552*** – The assumption that subsurface soil could be an exposure medium following disturbance of the land surface under certain future use scenarios is used in some risk assessments. However, the hypothetical future exposure is actually characterized as mixing of current surface and subsurface soil such that some of the eventual surface soil was derived from deeper intervals. EPA guidance makes clear that it is soil mixing, not just current subsurface conditions that is relevant to future exposures. Accordingly, the proper grouping of soils data to represent future mixed soil is to include all soil samples from current land surface to 10 feet below ground surface and to calculate exposure point concentrations from the set of data representing this entire soil column. The EPA's RI approach of calculating risks for future-use scenarios using surface soil and subsurface soil separately should be revised accordingly.

The future soil exposure scenarios should be computed using a single, mixed soil set of exposure point concentrations instead of duplicating the calculations for two different soil intervals. In addition to obtaining a better representation of possible conditions after hypothetical soil disturbance and mixing and making future risks clearer, this change will serve to reduce the number of separate risk tables that need to be prepared and considered. Since the surface soil conditions are accounted for in the current-use scenarios, the change to using just a mixed soil category for the future use scenarios will not result in the loss of any analyses or provide an inadequate characterization of risk associated with soil.

61) ***Page 553*** – The computation of the site-specific subchronic VFs and PEFs should be corrected to reflect the appropriate time interval per the cited EPA guidance. Equations 5-5 and 5-14 of the relevant 2002 EPA guidance document (SSG Supplemental Guidance) specify that the input value "T" should be the "Total time over which construction occurs," in seconds. Based on table footnotes, the current site-specific VFs and PEFs were apparently computed using the number of seconds in 8 hours over 180 days. Both the number of days and hours per day are inappropriate. The construction worker scenarios specify an Exposure Duration of 1 year. As a protective estimate, it is reasonable to anticipate that construction projects are better bounded by a 1 year assumption than a 6 month assumption. Also, as a simple matter of consistency, if the scenario is based on a duration of 1 year, this value should also be used in the VF and PEF computation.

Next, the VF and PEF are characterizations of flux from the soil to the air, NOT direct characterizations of exposure concentration. In other words, the particles or vapors are being emitted at some rate estimated by the VF and PEF dependent upon the characteristics of the impacted area, site activities, wind, etc. This emission flux and the corresponding transfer of constituents to the air occurs regardless of the presence of a receptor at a given time. So, calculating the site-specific VFs and PEFs using a time input of 8 hours per day is not consistent with the underlying basis for these metrics. The correct basis is using the number of seconds in 24 hours for each day of the assumed scenario.

Site-specific VFs and PEFs are calculated in a number of tables (e.g. Appendix R, Table 7-103, 7-104, 7-105, and 7-109) and in each case, the input value T should be revised from 5.2×10^6 seconds to 3.2×10^7 seconds ($60 \times 60 \times 24 \times 365$).

62) ***Page 553, fifth paragraph*** – The text specifies that exposure point concentrations (hereinafter "EPCs") were calculated as 95% UCL of the arithmetic mean concentrations. The EPC tables indicate that the underlying distributions were either log normal or not normal in many cases. In such circumstances, the statistic derived is not the confidence limit on an arithmetic mean. This should be corrected by revising the text to say the "95% UCL of the mean."

63) ***Page 553, groundwater EPCs*** – EPCs for groundwater should be based upon only the most recent result available for each well in an exposure unit. Sequential groundwater samples from the same well, particularly when they are obtained at intervals of several years, as is the case in this risk assessment, reflect changes in groundwater conditions. Older results are superseded by newer results. EPA guidance directs that baseline risk assessments be completed based on a current snapshot of conditions. Averaging current groundwater concentrations with older data (data that reflects conditions to which receptors can no longer be exposed) inappropriately characterizes current conditions. Based on the identification of samples included in the risk assessment shown in Table HHRA-1, it appears that multiple results reflecting conditions at different times have been included for some wells. The data included in EPC calculations should be updated to remove outdated results, ensuring that the most recent results from each well are used.

64) ***Page 554, Data Qualifiers*** – Additional description and substantiation of the handling of "B" qualifiers should be provided and the footnotes for the various tables in which this qualifier is defined should be reviewed and made consistent. Specification, and cross-referenced documentation in the appropriate appendix, must be provided regarding the source of the "B" qualifiers listed. This same qualifier, unfortunately, may be assigned by two different sources with importantly different meanings. The "B" qualifier assigned by a data validator, per EPA guidance, is used to indicate an estimated concentration for an inorganic analyte. Data assigned the "B" qualifier for this reason are properly included in EPC computation. However, the "B" qualifier is also a commonly assigned laboratory qualifier used to indicate the presence of contamination in the blank. Inorganic results where the metals are present due substantially to contamination in the laboratory must be excluded from quantitative risk assessment per EPA guidance. Since the inclusion/exclusion criteria per EPA DQOs for handling "B" qualified data is complex, this should be described in detail. Numerous groundwater result tables and some soil tables included in the risk assessment appendix define the "B" qualifier in the table footnotes as indicating blank contamination. Other tables, mostly soil tables, define the "B" qualifier as indicating estimated concentrations for metals. If the results are actually indicative of blank contamination, such a footnote is importantly misleading regarding data quality. The qualifier should be defined consistently and data qualified by the laboratory with a "B" should not be included without proper consideration of DQO requirements for results with blank contamination.

Risks calculated on the basis of metals present due to laboratory contamination, which appear to be reflected in some of the risk tables, should be made very clear to risk managers so that they can be given appropriate weight in remedial decisions. For example, risks were

calculated for residential well PVDOM01 (Appendix R, Table 2.1) based on arsenic being detected in one sample, 5 times less than the current drinking water standard (25 times less than the then current drinking water standard) and "B" qualified. The data qualifier is clearly significant in situations such as this where the non-specialist reader may readily misunderstand the significance of a hypothetical calculated risk estimate and may not understand that the water meets carefully considered drinking water standards.

Also, in Appendix R-Table 3.2, the "Q" qualifier appears but is not defined. This is also a qualifier that has multiple definitions and it should be both defined and its handling per DQO requirements should be made clear.

65) ***Page 554, Estimation of Chemical Intakes*** – The soil-to-skin adherence factor (hereinafter "SSAFs") used in the dermal exposure route for the youth recreator receptor exposed to sediment from Pohatcong and Shabbecong Creeks is a value specifically disavowed by the cited EPA guidance document because it inappropriately overestimates potential risks. The SSAF selected is approximately 100 to 500 times greater than typical SSAFs used for risk estimation and should be revised.

EPA's RAGS Part E Guidance (2001) for dermal exposure states, "Information on soil adherence values for the children-in-mud scenario is provided to illustrate the range of values for this type of activity. However, the application of these data to the dermal dose equations in this guidance may result in a significant overestimation of dermal risk (p. 3-16)." The scenario identified, and currently used for the creek sediment SSAF is based on characterizing the amount of mud, derived from soil, not sediment, that might adhere and dry on a child's skin.

The risk assessment cites this guidance as the basis for characterizing the scenario, then selects the very SSAF that is specified not to be useful for quantitative risk estimation. The subsection in RAG Part E discussing the use of soil dermal exposure equations with sediment also points out that care should be taken regarding overestimating sediment adherence since much of the sediment that a wading receptor comes in contact with is subsequently washed away as they move through the water and does not adhere to the skin for sufficient time such that the predictions of dermal absorption reflected in the equations are relevant. Thus, the use of the inordinately high SSAF is, thus, particularly inappropriate for sediment exposure pathways.

There is an activity scenario listed in RAGS Part E, Exhibit 3-3, that is much more relevant to stream sediment exposures. The SSAF associated with reed gatherers, who wade through sediments in shallow water bodies, has been measured. The mean value of 0.3 mg/cm^2 specified for this scenario is a reasonable maximal exposure input factor. RAGS Part E specifies that mean SSAF values for high exposure activities should be selected for RME scenarios. The reed gatherer scenario qualifies as a high exposure activity relative to the amount of extensive contact and adherence of long enough duration to produce absorption anticipated from a youth wading in these creeks. Using this value also appears appropriate relative to the assumptions used for soil exposures, since it remains higher than the SSAF used for soil adherence to child receptors.

Also note that on Appendix R, Tables 7.22 RME and 7.22 RME, the exposure medium that appears at the bottom of the table is erroneously listed as "Surface Water." The rest of the table refers to a sediment risk calculation.

66) ***Page 561*** – Based on its risk assessment calculations, EPA concludes that the soils at the former ANC property do not present any unacceptable carcinogenic or non-carcinogenic risk given the current use of the property. Even under a residential use scenario, the only unacceptable risk levels found are related to metals that EPA believes are background conditions. Yet EPA is still seeking remediation of soils on the former ANC property. This inconsistency also applies to soils in AC1 which EPA assumes are on the former ANC property. EPA's approach is inconsistent with the NCP. Further, at other properties, such as Five Carp Company, LNL/Econowash and Modern Valet Services, where similar risk assessments results were developed, no soil remediation is proposed.

67) ***Page 569, fourth full paragraph under heading Tung-Sol Tubing (TVN)*** – In this paragraph, EPA concludes that the carcinogenic risk to residents exposed to surface soils on this property is unacceptable due to PAH's and arsenic. This property is currently used for residential purposes. Yet, EPA does not propose any measures to address this unacceptable exposure risk.

68) ***Page 570, under the heading Vikon Tile Corporation (VTC)*** – In the paragraphs making up this section of the risk assessment, EPA concludes that a resident's exposure to xylene levels in subsurface soils poses an unacceptable risk. Cadmium also poses an unacceptable exposure risk. The "RME carcinogenic risk" from PAH's and arsenic in the surface and subsurface soils also present unacceptable risks to future residential users. In addition, the non-carcinogenic risk to construction workers exposed to surface soils, subsurface soils and perched groundwater at Vikon Tile exceeds acceptable levels. EPA has not proposed any corrective measures for any of these conditions. Further, the presence of xylene may stem from past industrial solvent use on this property and may be indicative of onsite, as opposed to offsite, contributions to regional groundwater conditions. EPA simply ignores these soil conditions in its remedial conclusions.

69) ***Page 571-572, under the heading Trespasser Area 1*** – In this section of the risk assessment, EPA found that no unacceptable exposure risk exists due to exposure to surface or subsurface soils in these areas, which include AC1 and ANC B.

70) ***Page 653, first full paragraph*** – EPA states that "solvents, such as TCE" were used in the manufacturing process at the former ANC plant and that a 1953 drawing shows that the reclaim line injecting ground water back into the aquifer may have been connected to floor drains. A thorough review of past plant practices indicates that toluene was the most commonly used solvent at the Site. Toluene is not a constituent of concern at the Site. In addition, none of the plant drawings shows a connection between the reclaim line and floor drains. The 1953 drawing indicates that several drain lines connected to the reclaim line were capped at the floor level for future use. Since the reclaim line returned non-contact cooling water to the aquifer, it is

likely that these lines were set up for potential future use to convey non-contact cooling water from this area to the reclaim well. A 1966 drawing shows that these lines were in use at the that time and were used to discharge non-contact cooling water from air compressors to the reclaim well.

In the last two paragraphs of this page, EPA accurately describes the theoretical process of vertical and horizontal migration of COPCs. As EPA notes, in areas where COPCs were released along a drainage channel, "the COPCs would migrate laterally along the course of the channel and vertically through the base of the channel." Although there is no well-defined drainage channel in this area, this mechanism of migration would also apply to overland flow that is not through a channel. Therefore, if the EPA hypothesis that TCE was introduced through a drainage channel at AOC 16 on the former ANC property is correct, TCE should have migrated both vertically and horizontally through the soils in the area. Evidence of this migration should be seen in the presence of significant quantities of TCE in the fine-grained soils under the hypothetical discharge point (AOC 16) and in the areas downslope of AOC 16. However, the data collected by EPA and ANC both show that significant quantities of TCE are not present in soils below the AOC 16 outfall or in the area immediately downslope from the outfall. This is a direct contradiction of the EPA hypothesis and indicates that some other mechanism (such as direct discharge of TCE on the Norfolk Southern railroad property) is likely responsible for the TCE detected on the railroad property.

71) ***Page 653, second full paragraph*** – In the second full paragraph, EPA presents its theory for how storm drainage from the former ANC property impacted AC1 and the Warren Lumber property. Several surface water discharges are noted, though EPA sampled only three, and found TCE in only one. EPA detected TCE in PVANC49 at AOC 17. However, TCE was not detected in the samples from an outfall south of the former ANC facility (PVANC50 at AOC 16) and northwest at that facility (PVANC53 at AOC 18). (*See* page 155) EPA's statement that discharges from the western slope of the property contribute to TCE findings is pure speculation and not supported by the trace concentrations of TCE detected in the limited number of samples collected. Data associated with the drainage paths from the former ANC property does not support EPA's general conclusion or the more specific conclusion that AC1 is attributed to drainage from the former ANC property.

Finally, the drain at AOC 17 is a storm drain, not a building drain as was assumed by EPA.

72) ***Page 654, first paragraph*** – EPA uses the New Jersey Impact to Ground Water Soil Cleanup Criterion (IGWSCC) as a basis for evaluating the potential for soil contamination to affect ground water quality. The IGWSCC values were developed by the NJDEP as generic criteria and are not based on a rigorous evaluation of risk or local geology. More accurate criteria can and should be developed on a case-by-case basis to evaluate the potential for impacts to ground water from soil contamination. These site-specific criteria should then be incorporated in any remedial decisions for OU1.

73) ***Page 656, first paragraph*** – EPA understates the significance of volatilization in surface waters. Any TCE that is discharged to surface waters is not likely to persist for any appreciable time period due to volatilization. This is pertinent to EPA's theory that surface drainage flow produced AC1, an area EPA assumes is 28,000 square feet and 100 feet deep.

74) ***Page 656-657, Section 7-4*** – In these paragraphs on plume behavior, EPA summaries the complexities of flow, degradation, reductive dechlorination and chlorinated transformation and highlights the fact that these characteristics are variable within the plume. EPA's calculations of TCE contributions to the plume can not have taken into account the real complexities within an over 8.75 mile plume since data for relevant parameters such as carbon, dissolved oxygen and relevant ions does not exist for the large majority of that plume. For example, average transmissivity among the wells ranged from 0.02 ft^2/day to 18,300 ft^2/day and hydraulic conductivity ranged from 0.01 ft/day to 1405 ft/day. Further transmissivity values for different zones within wells 7 and 8 at Warren Lumber ranged four orders of magnitude. In addition, adequate stratigraphic and hydrogeologic information does not exist for much of the plume to allow such calculations to take place. EPA has done no dye tests, has not defined fracture zones and has performed only limited pumping tests. In fact EPA used data from one area of the aquifer and assumed it remained the same throughout the plume. EPA's calculations must be viewed as an oversimplified guess at best, and not an adequate basis for assuming source(s) or planning remedies.

75) ***Page 658, fourth paragraph*** – There is a typographical error. The phrase "sample data is" should be "sample data are."

76) ***Page 658, fourth paragraph*** – There is a typographical error. The phrase "analytical data is" should be "analytical data are."

77) ***Page 658 – Section 7.5*** – EPA supposedly relied on two years of data (from 2000 and 2002 – not eight consecutive quarters of data) to evaluate the persistence of chlorinated VOCs in the groundwater beneath the Site. Based on those data, EPA concludes the plume is at a steady state with 310 pounds of TCE entering the ground water each year. Sampling data from two years is simply inadequate to make these kinds of declarations for a complex karst area, particularly when not all wells were sampled in each of the selected years. Further, the data relied upon was not actually collected in two years, but rather spans the period of 1999 through 2002.

In addition, data from the Dale Street well indicates that TCE concentrations are in fact decreasing over time. This contradicts EPA's concept of a steady state plume. EPA's other RI data confirm that the plume is not in a steady state. Again, EPA has ignored its own determinations about the complex nature of the hydrogeology here, as well as its own sampling data, and opted for a simplistic alternative. It is the Agency's unwavering supposition that 310 pounds of TCE enters the plume each year that has caused it to assume soil sources of specified sizes in the absence of any confirmatory data.

78) ***Page 660, second paragraph*** – The EPA discussion of BTEX compounds is highly speculative. No concrete evidence is presented to support EPA's statements.

79) ***Page 667, first full paragraph*** – The supposed source area identified by EPA is not "centered around the ANC site." The two source areas identified by the EPA based on sampling results are both located on properties to the south and southwest of the former ANC property (Norfolk Southern and AC1 sites). EPA has placed a wholly hypothetical source on the former ANC property itself, but there are no sampling data that support the existence of this source. Even if the hypothetic on-site source existed, it would not be accurate to describe the source areas as centered on the former ANC property.

80) ***Page 1999, second full paragraph, Appendix I*** – The EPA used image well theory to construct boundary conditions in the isotropic and homogenous ground water model the Agency applied to the Site. Due to the limitations inherent in that model, flow near the crystalline rock boundaries with the carbonate aquifer is overestimated, resulting in distortions of the flow patterns in the critical area near EPA's assumed source areas. As a result, the production wells on the former ANC property appear to capture ground water from the crystalline rock rather than from the re-injection well on that same property. This modeling result is clearly inaccurate. The data from Environ's modeling of the area near the former ANC site show a much more intuitively logical result -- most of the injected water is captured by the nearby production wells (Exhibit 1).

81) ***Page 2001, Table 1-2, Appendix I*** – Due to the nature of the model EPA applied in the RI, the resultant modeled error in head values for the production well on the former ANC property is excessive and reflects the inappropriateness of the model for this portion of the regional aquifer.

82) ***Page 2001- Formula (Appendix I)*** - The root mean square formula shown as being used to calibrate the model is incorrect.

83) ***Pages 2001 through 2028, Packer Tests (Appendix J)*** – The data provided concerning sample collection during the packer tests appears to be inconsistent with the completion dates for the wells in which the packers were placed. In fourteen of the wells, the completion dates are earlier than the packer testing dates. As indicated in the RI, the packer tests were completed on open boreholes before the wells were cased. Therefore, either the dates for the packer tests, or for the well completions are incorrect. Correction of this information is crucial to an evaluation of the efficacy of the packer test results.

Comments
OU1 Feasibility Study

84) With the publication of the Proposed Plan for OU1, the public, including PPPI and Alcan, has been afforded its first opportunity to comment on the FS. In formulating remedial options for source areas for the TCE plume, EPA deals only with soils on and about the former ANC property. No review of the Five Carp Company, Tung-Sol property, AC1, Vikon Tile or

upgradient locations is included in the FS. In addition, no explanation for this highly selective approach is provided.

85) ***Page 9*** – EPA has simply made up two soil source areas. First, in the absence of any data whatsoever, EPA has "assumed" an area called ANC C and imagined it is 100 feet deep and 16,000 feet square. Second, EPA has decided, based on a few centrally located sample points that do not delineate the extent of contamination, that there is a 100 foot deep, 28,000 square foot source area on AC1 and the Norfolk Southern property called ANC A. Finally dimensions for ANC B are created based on one sample location and findings of TCE at depths that clearly could not contribute to groundwater impacts. Perhaps even more amazingly, EPA then proceeds to do an analysis of possible remedial approaches and costs for these fictional areas. EPA's actions in assuming or creating sources to bolster its pre-determinations about soil sources on or near the former ANC property are clearly inconsistent with the NCP.

In the last full paragraph on page 9, EPA acknowledges that based on its calculation of TCE mass in OU1, the TCE found in soils on and around the former ANC property is insufficient to support the TCE plume. Instead of then concluding that additional TCE sources must exist (or must have existed) in other parts of OU1, as the data indicates, or that its assumptions about contaminant fate and transport may be wrong, EPA adopts the unique strategy of assuming soil sources as noted above.

86) ***Page 9 – third full paragraph*** – EPA describes ANC B as being five feet in depth. However, groundwater in this area is about 100 feet below ground surface. Therefore, given EPA's own findings, ANC B could not have contributed any TCE to the regional ground water and can not be viewed as a source area. No remedial actions are needed to protect against the non-existent risk to groundwater presented by ANC B. Despite the non-existent risk, EPA proposed excavation of ANC B to protect groundwater.

87) ***Page 11, Table 5-1 and Table ES-1*** – The presentation of SO3 is inconsistent with the detailed analysis of alternatives presented in the FS Table 5.1. For example, in Table 5.1 (page 129 of the FS), the detailed analysis of the alternatives and specifically SO3, omits consideration of ANC C. It should be clear that all alternatives and the related components (e.g., off-gas control requirements) are fully evaluated for the entire TCE mass expected to be treated.

88) ***Page 15, first full paragraph*** – EPA states:

> The perched aquifers are localized and limited in extent, they do not represent a significant conduit for the migration of impacted groundwater and are not used as a potable water source.

As noted in comment 9 above, there are no perched aquifers on the former ANC property.

89) ***Page 16, second full paragraph*** – Here EPA states:

> ". . based on information provided by the current owner of the ANC facility, surface discharges to this area may have been initiated in the 1950's."

This statement does not reflect the fact that information about early discharges at the former ANC property is not definitive or detailed. Some recognition about the quality of available information should be included in the FS.

90) ***Page 16, third full paragraph*** – EPA states that, based on RI soil investigation, the depth of two source areas at ANC/AC1 vary, with one location exhibiting impacts only as deep as five feet, while the other exhibits impacts going down to one hundred feet. That statement is not entirely accurate. The one hundred foot depth is assumed by EPA; it is not based on sampling data. Furthermore, ANC A and B are not, in fact, on the former ANC property.

91) ***Page 16, Section 1.5.1*** - In this section of the FS, EPA repeats some of its suppositions from the RI. For example, EPA states, as if it is fact, that 1940 pounds of TCE remain in the soils (third paragraph). The mass of TCE in the soils is a calculation based on extrapolating data from a few limited sampling points over a much larger area and is based on untested assumptions concerning soil chemistry and conditions. In that same paragraph, EPA seeks to explain away the discrepancy between its "calculation" of total TCE in the regional aquifer with the lack of data showing sufficient TCE at the former ANC property by creating a source area of the necessary size beneath the building on that property and attributing specific dimensions to two other supposed source areas. As stated in earlier comments, concocting source areas on a particular property to explain away impacts or discrepancies in the calculations is inconsistent with the NCP and CERCLA.

92) ***Page 17, Section 1.5.2*** – In describing the TCE groundwater impacts, EPA simply ignores the fact that TCE was detected in a number of locations upgradient of the former ANC property and in wells located upgradient of the industrial operations on the former ANC property. Figure 1-4 also conveniently ignores the data showing relatively high levels of TCE in domestic wells upgradient of the former ANC facility. TCE was also detected in MW5 and MW7 on the former ANC property. Both of these wells are located upgradient of industrial operations at that property. EPA may not simply disregard data that does not support its pre-conceived view of the regional situation in completing its FS.

93) ***Page 17, Section 1.5.2*** - At the end of the first paragraph in this section, EPA asserts there are approximately 8,240 pounds of TCE in the groundwater. It is not technically possible for EPA to make that calculation given the information available to the Agency. As EPA has stated, the Pohatcong Valley has a complex groundwater regime which includes karst features. EPA does not have the necessary fracture, flow and volume information before it to conclude that 8,240 pounds of TCE are present in the 8.75 square mile area. Nor does EPA have sufficient measurements of TCE concentrations throughout the plume area to arrive at the 8,240 pound figure.

EPA then back calculates that, if 8,240 pounds of TCE are in the plume and the plume is in a steady state as far as TCE is concerned, then a certain level of TCE must be present in soil sources. The Agency then goes one step further and decides that not only must that TCE be present in soil sources, but these sources must be on or related to the former ANC property despite data to the contrary. This type of wholesale fictionalization of conditions in the Pohatcong Valley Ground Water Site OU1 is not conducive to selection of an appropriate and effective remedial action. It is also clearly inconsistent with the NCP.

94) ***Page 18, first full paragraph*** – In this paragraph, EPA concludes that such factors as adhesion and surface tension act to restrain migration and "retain contaminants within the soil media." EPA further states that these physical processes result in the spreading of TCE "vertically throughout the soil column under the original source area" (emphasis added). EPA then proceeds to disregard these statements in identifying soil source areas at or near the former ANC property. ANC Area B only shows TCE to a depth of five feet, yet EPA assumes it is a source of TCE to groundwater over a hundred feet deep. Other sampling at the former ANC property similarly shows no detection of TCE below a depth of 6.5 feet with ground water some eighty or more feet deeper. EPA provides no explanation for these contradictory aspects of its RI/FS reasoning.

95) ***Page 18, second full paragraph*** – In this paragraph, EPA repeats its assumption that influences from the re-injection well are responsible for TCE impacts at the VAN property. However, as the attached modeling report shows (Exhibit 1), EPA's assumed mounding influence does not, in fact, exist. EPA does not attempt to present any explanation for the upgradient TCE impacts at the Washington Mechanical property, which is significantly further upgradient than the VAN location.

96) ***Page 18, last full paragraph*** – In this paragraph, EPA explicitly admits that there must be an, as yet, unsampled source of TCE to the groundwater. That said, EPA then goes on to create a 16,000 square foot source and ascribe 28,000 square feet to another source, in the absence of supporting data. Again this exercise in designing remedial approaches for made-up source areas is not consistent with the intent or language of the NCP.

97) ***Page 19, third full paragraph*** – EPA states that TCE concentrations in the ground water will exceed the New Jersey Groundwater Quality Standard for over one hundred years. No basis for that conclusion is provided in the FS.

98) ***Page 21, second bullet point under the heading Human Health Risk Characterization*** – EPA states that the TCE detected in surface and subsurface soil at ANC/AC1 may pose carcinogenic and/or non-carcinogenic hazards to residents, industrial/construction workers. These speculative risks are supposedly associated with inhalation of TCE in volatile and fugitive emissions from the soil. However, Section 6 of the RI finds no such potential unacceptable risks. In fact, that section concludes that these soils present no unacceptable risks other than those associated with certain naturally occurring metals. EPA may not disregard its own risk assessment to assume potential risks exist for remedial options development.

99) ***Page 22, Section 1.8*** – In the third paragraph, EPA again refers to the 1940 pounds of TCE in soils. The human health assessment is then based on the assumption that this TCE is present. Basically, EPA is piling hypotheticals on top of fictions throughout its risk evaluations. The intent of the NCP is clearly that sufficient data be developed before risk or remedial decisions are attempted. That was not done here.

100) ***Page 23, first full paragraph*** – EPA again describes the assumed source as an original source. EPA should be clear throughout the document that the soil source is not a true documented source, but rather an assumed or suspected source without data to support its existence.

101) ***Pages 24 and 25, Table 1-1 and 1-2*** – EPA makes the point of describing the number of environmental samples included in the RI as apparent evidence of the comprehensive nature of its investigative activity. However, EPA stops short of admitting the source has still not been documented, but assumed.

102) ***Page 35, Section 2.2.1*** – EPA casually equates the findings for the AC1 soils and the former ANC property soils. There were no exceedences of TCE standards found on the former ANC property by EPA during the RI. EPA simply ascribes any exceedences found in that area of OU1 to the former ANC property though the RI does not present data to confirm these assumptions. For example, there is no actual data connecting the former ANC property drainage point known as AOC 16 to AC1 soil findings.

103) ***Page 38, Section 2.4.1*** – In the second paragraph of this section, EPA states that "it has been assumed that ANC A will require remediation to the water table. . . ANC C is assumed for costing purposes to contain TCE distributed to an approximately 16,000 square foot area." No data shows that ANC A is 100 feet deep or that it requires remediation to that depth. Even more incredible, no data exists to show that assumed ANC C exists at all; the area is a product of EPA's imagination.

According to the NCP, the RI is to provide sufficient data to allow remedial alternatives to be defined and evaluated under the nine NCP criteria, including cost. The Pohatcong Valley Groundwater Site OU1 RI did not achieve that goal. The NCP does not then allow EPA to simply assume contamination impacts to the extreme point of totally making up source areas to evaluate under the nine criteria in the FS. EPA clearly wanted to move along in a CERCLA process that was taking more time than was desirable to complete. However, EPA may not simply disregard the NCP in rushing toward a final remedial decision.

EPA is apparently applying the same soil target cleanup standard to soils (whether real or assumed) without consideration that one location is already covered (assumed area ANC C is beneath the existing manufacturing building). The soil target cleanup standard for the soil beneath the building should differ from areas without cover.

104) ***Page 41, Figure 2-1*** – EPA has drawn each of the areas of supposed soil contamination it has attributed to the former ANC operations on this figure. Assumed ANC Area C is properly labeled as "suspected" since absolutely no data exists showing that any such area of any size or depth exists. However, Areas A and B are shown as red circles. One sample defines Area B. The Agency provides no explanation as to how one sample is adequate to define the lateral extent of an area. A similar problem exists with Area A. Here the Agency used three locations to define the circle. No samples define the drawn boundaries of this Area, yet its dimensions are treated as fact by EPA in its RI/FS.

105) ***Page 42, Figure 2-2*** – This figure purports to show the TCE Groundwater Area exceeding PRGs. However the Washington Mechanical property is not included in the contours despite the detection of 130 ppb of TCE in the groundwater at that location. EPA provides no explanation for its elimination of the Washington Mechanical property – an area where significant TCE contamination is known to be present in the groundwater - from the Site Figure.

106) ***Pages 68, first and second full paragraph*** – EPA states that the six alternatives are based on "the current understanding of the extent of TCE contamination in soils" when a large mass of the contamination to be treated is assumed or hypothetical. Further, EPA states that if the soil contamination is limited to above 25 feet then the DPE system component may be modified to a simpler SVE system. Based on the known soil impacts, a simpler remedy would seem to be the appropriate response. EPA is required under the NCP to develop a remedy taking into consideration all of the known environmental impacts.

107) ***Page 69, second full paragraph*** – Here EPA estimates that the volume of soil to be managed in Area B is 370 cubic yards. That estimate is based on one sample. EPA simply has no way of knowing the extent of the Area B it has asserted exists. Using its assumptions about Area B, EPA concludes the best remedial alternative is excavation with disposal on a Subtitle D landfill. EPA further assumes, without providing any supporting detail, that the costs of such work are so minor that they do not need to be considered in the cost comparison in the FS.

On the same page, in the next paragraph, EPA states that because the volume of soil in ANC A is unknown, no cost estimate for its excavation is included in the FS cost analyses. Apparently the Agency is less confident about estimating based on three samples, than it is based on one sample. The Agency's approach to remedial costing in the FS is clearly inadequate and inconsistent with NCP requirements.

108) ***Page 71, second full paragraph*** – EPA states that given the low permeability of soils at the former ANC property, TCE may persist in those soils for decades. This statement is telling for two reasons. First it acknowledges the low permeability of the soils at the former ANC property, a fact EPA questioned in other parts of the RI/FS. Secondly, the statement acknowledges that TCE (were it present) would persist in such soils for decades. Yet, data from the former ANC property shows that TCE is non-detectible in soils below 6.5 feet. If the TCE

were migrating from shallower soils to the regional aquifer beneath the former ANC property, TCE would persist in the intervening low permeability soils according to EPA. It does not.

109) ***Pages 75, Section titled Pneumatic Fracturing*** – EPA fails to recognize the potential issues with pneumatic fracturing. As recognized by Federal Remediation Technology Round-Table, pneumatic fracturing has the potential to create new pathways for unwanted migration of the contaminants. Instead of taking advantage of the benefits from the naturally low permeability soils, EPA is proposing to mix and fracture those soils thereby opening migration pathways. This disadvantage of fracturing should have been clearly considered in the FS.

110) ***Page 79, under the heading Site Preparation/Restoration*** – This alternative involves moving production equipment, shoring up the building supports and generally rendering an area of the plant unusable. As the Agency is aware, the former ANC plant is an operating facility. PPPI has no interest in dismantling its process areas for an indeterminate period. This remedial alternative must be rejected as impracticable.

111) ***Page 81, under the heading Dual Phase Extraction*** – The bullet points under this heading illustrates the absurdity of drafting an FS when source areas are created in the absence of data. Here, EPA has assumed the size of each source area, which then led to an estimate of wells and spacing. An assumed average TCE concentration then leads to an estimate of emission rate. This entire remedial alternative is founded on one assumed condition after another. The NCP clearly does not contemplate such an approach to remedial options development.

112) ***Pages 82 through 84 under the heading "Groundwater Alternative G2 – Monitored Natural Attenuation and Institutional Controls"*** – EPA rejected the monitored natural attenuation water alternative on the basis that it would take fifty-nine years to achieve EPA's concentration goals. However, EPA's own FS modeling shows that monitored natural attenuation would take only fourteen years to achieve EPA's defined goals at the source and fifty-nine years only at the downgradient edge of the plume.[6] The selected groundwater alternative is modeled to take ten years and fifty-five years in the analogous portions of the plume. Given EPA's repeated statements that any short term risk from ground water has been addressed through the existing alternative water supplies, EPA has no basis for eliminating monitored natural attenuation as a groundwater remedial alternative given its modeling results. This is particularly true given the complex hydrogeology in the region and the costs savings this approach would produce. Further it is consistent with remedies at similar sites with similar hydrogeology (e.g., Dorney Road (Oswald) Landfill in Lehigh and Berks County, Pennsylvania (EPA ID: PAD980508832) where monitored natural attenuation and point of use treatment have been implemented.

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[6] By citing this discrepancy in EPA's FS, we are not accepting either the input or the conclusions of EPA's groundwater modeling efforts.

113) ***Page 83, under the heading "ANC Production Well Treatment"*** – EPA comments that re-injection of groundwater on the former ANC property results in water table mounding that could lead to potential spreading of the TCE plume. As Exhibit 1 to this submission demonstrates, the mounding caused by the re-injection is quite limited in scope and therefore would not be a significant factor influencing the TCE plume.

114) ***Page 84, third full paragraph*** – EPA states that monitored natural attenuation of the TCE/PCE plumes is expected to take 59 years. The Agency does not make clear whether it is the TCE or the PCE which is dictating that time estimate.

115) ***Page 94, first sentence*** – EPA states that the average width of the TCE plume is 3,000 feet; the thickness is 200 feet and it is over five miles in length. The RI does not present sufficient data to legitimately define an average plume width or its depth. EPA is once again extrapolating plume characteristics from a limited data set and improperly presenting them as fact. These elements are critical to EPA's analyses of groundwater remedial alternatives and selection. It is inappropriate to use such unmeasured parameters as the basis for remedial selection.

116) ***Page 101, Figure 4-1*** – This drawing of ANC A depicts EPA's dual phase extraction option. However EPA has not provided adequate data supporting any need for dual phase extraction. EPA simply assumes that since TCE is a volatile, there must be a need to extract vapors from the soils in addition to treating the groundwater. Again, EPA lacks the data to evaluate the appropriateness of applying dual phase extraction in the so-called soil source areas.

117) ***Page 113, last paragraph*** – With the last sentence of this paragraph, EPA has highlighted an inconsistency in its portrayal of the Site and the supposed source areas. In that sentence, EPA concludes that a cover over assumed area ANC C would have no effect since ANC C is supposedly under a building. The remedial alternative of capping is intended to reduce infiltration and therefore slow leaching to ground water. What EPA is in effect saying is that if ANC C exists at all, the building has already minimized leaching to ground water. Add that to the admittedly low permeability soils, lack of perched water and depth to groundwater and the potential TCE contribution to the regional aquifer from EPA's imagined ANC C appears small.

Yet in its calculation, EPA assumes that ANC C contributes 266 lbs per year of TCE to the regional groundwater. No mechanism for this supposed movement of hundreds of pounds of TCE beneath the building through over eighty feet of low permeability soils is presented. In its modeling analyses, EPA has assumed an infiltration rate of one foot per year at both ANC A and ANC C. No explanation is provided as to how the same infiltration rate can exist at low lying uncovered ANC A and concrete covered ANC C.

118) ***Page 138, Table A-3*** – On this Table, EPA lists its formulation of hypothetical additional area leaching TCE from soil to groundwater, i.e. ANC C. CERCLA and the NCP do not provide EPA with authority to hypothesize source areas requiring remediation. The NCP process requires a step by step investigation and analysis so that releases and threatened releases are characterized for remediation. Nowhere does the NCP say if you find no source, make one up.

119) ***Page 159, last sentence on the page*** – In this sentence, EPA states that the pumping and injection at the former ANC property "do not appear to influence the local ambient hydraulic gradient." This statement contradicts EPA's RI assumption that the pumping and extraction at the former ANC property reversed the flow direction of the ground water so that naturally upgradient detection of TCE is asserted to have been caused by the naturally downgradient former ANC property. With this statement, EPA has eliminated the underpinnings of its argument that no source of TCE upgradient of the former ANC property exists or existed.

120) ***Page 171, first paragraph under the heading "Modeling"*** – In this paragraph, EPA states that the TCE ground water plume is in a "steady state condition." As noted above, EPA lacks sufficient information to make such a statement. In addition, given the fact that TCE is not currently used at the former ANC property and any TCE detected in soils on that property has been removed over the past several years, it is difficult to understand how the plume could remain in a steady state. The only possibility seems to be sources beyond the former ANC property in conjunction with the fact that impacted soils identified at the former ANC property were never a significant source of TCE to the regional ground water.

121) ***Page 172, first full paragraph*** – There is a typographical error. The phrase "The data is" should be "The data are."

122) ***Page 173*** – In reviewing EPA's modeling of the time frames for the various remedial alternatives, it is clear EPA changed the location of the source area from modeling run to run. This would appear to preclude alternative to alternative comparisons of results as required by the FS.

Comments on OU1 Feasibility Study Modeling

General Comments:

123) The methods used to estimate total mass and mass flux greatly oversimplify the complex geology and hydrogeology of the Site. The soil and groundwater are modeled as homogeneous compartments with single input parameter values selected to represent the entire volume. Throughout the RI and FS, the hydrogeologic complexities of the Site are discussed; however, there is no attempt to account for this complexity in the total mass and mass flux calculations. For example, the RI states, "Groundwater in the bedrock occurs mainly within voids, fractures, and bedding planes in the rock. Karstic features such as large-scale voids were encountered at several bedrock monitoring locations." [RI P. 84]. Since preferential pathways

predominate in karst bedrock, modeling the bedrock as a homogeneous porous medium is inappropriate.

124) In the modeling, numerous non-Site specific parameters were used without any basis as to their applicability or relevance to actual Site conditions. The use of such values results in total mass and mass flux estimates with high degrees of uncertainty.

125) A quantitative analysis of uncertainty (potential range of values) and statistical confidence intervals are not provided. Uncertainty in the input parameters can have a major affect on the output values of the model/calculations as discussed below.

126) The sensitivity of the total mass and mass flux calculations to changes/variations in the input parameters has strong implications with respect to the Site's conceptual model of contaminant fate and transport and the identification of sources areas contributing to groundwater contamination. These in terms have fundamental implications for remedial selection decisions.

Specific Comments:

127) ***Table A-1. TCE Mass Flux Leaching from Soil to Groundwater (FS page 136).***

- The area of ANC A is reported as 28,000 ft^2. The basis for this number is identified on page 134 as the FS Report, Figure 2-1. On Figure 2-1, the area exceeding PRGs for Area A is identified. Using the scale presented on the Figure, the area is approximately 18,653 square feet [area of ellipse = length x width x pi / 4 = 237.5 ft x 100 ft x pi / 4 = 18,653 ft^2]. Leaving all other parameters constant, the TCE mass flux value is then decreased by over 30% (from 44 lbs/yr to 29 lbs/yr) when the area is changed from 28,000 to 18,653 ft^2. EPA is not even consistent in its construct of ANC A or mass flux throughout its own RI/FS.

- The average soil concentration of 6,300 ug/kg is not supported by the data. The characterization of ANC A is based on five samples presented in Figure 2-1 of the FS Report: PVANC25, PVANC32, PVANC33, PVANC39, and PVAC106. The sample depths exceeding PRGs for these five locations are presented in Figure 1-3 of the FS Report. The full dataset for these locations is presented in the RI pages 139-140 and 165-170. The deepest sample detected above PRGs was found at 15 feet. Only one location, PVANC39, was sampled below 15 feet. At this location, concentrations of 110 and 29 ug/kg were observed at depths of 16 and 81 ft., respectively. In the northern portion of ANC A, the arithmetic average concentration from 15 ft to 81 ft (deepest sample collected) is less than 100 ug/kg [15ft: PVANC32=260 ug/kg, PVANC33=7 ug/kg, PVANC39=13 ug/kg; 16ft: PVANC39=110 ug/kg; 81ft: PVANC39=29 ug/kg.] These data do not support an

average soil concentration of 6,300 ug/kg within ANC A.[7] If the actual data were used, a much smaller mass of TCE would have resulted.

- A non-Site specific value of 0.002 g/g is used for the fraction of organic carbon (hereinafter "foc") in soil. A different non-Site specific foc value for soil, 0.006 g/g, was used in Appendix R of the RI (page 3666). No explanation is provided as to why the differing foc values were used in these two applications. The uncertainty associated with this value has a major affect on the estimated TCE mass flux. For example, the TCE mass flux value is decreased by nearly 67% (from 44 lbs/yr to 15 lbs/yr) when foc is changed from 0.002 to 0.006 g/g (Leaving all other parameters constant). In addition, these values are not Site-specific. Site-specific values, which would have given a more realistic assessment of the Site, were not developed.

- A non-Site specific value of 126 mL/g is used for the organic carbon partition coefficient (hereinafter "Koc"). A different non-Site specific Koc value, 166 mL/g, was used in Appendix R of the RI (page 3666). No explanation is provided as to why the differing Koc values were used in these two applications. The uncertainty associated with this value has a major affect on the estimated TCE mass flux. For example, the TCE mass flux value is decreased by nearly 25% (from 44 lbs/yr to 33 lbs/yr) when Koc is changed from 126 to 166 mL/g (Leaving all other parameters constant).

- The average mass flux to groundwater, based on the values for Koc and foc used in the RI (Appendix I page 3666) and the area of ANC A presented in Figure 2-1 of the FS, is 7 lbs/year. This value accounts for less than 2.5% of the EPA's estimated TCE mass flux within the groundwater of 310 pounds/year. Attributing the missing 97.5% of the TCE groundwater mass flux to a fictitious source unsupported by the data (suspected area ANC C) is arbitrary and capricious. If, for purposes of these comments only, it is assumed that a calculation of mass flux is possible with the available data, the resulting poundage would be a fraction of the 2.5% EPA has calculated with its assumptions and use of values that are not site-specific. Basically, with its assumptions and use of values that are not site-specific, EPA has reportedly identified 2.5% of the TCE source and assumed a location for the remaining 97.5%. However, factoring in the actual data demonstrates that, in fact, EPA has identified even less than 2.5% of the TCE source through its RI.

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[7] EPA has assumed that the entire area ANC A is 100 feet deep . However, the sampling only extends to 81 feet and only at one point. Other deepest samples from the other four points within Area ANC A are only fifteen feet deep and the deepest exceedance was found at that depth. Therefore, to assume that ANC A extends to a depth of 100 feet over the entire 28,000 area is inconsistent with the available data.

128) ***Table A-2. TCE Mass Flux within Groundwater (FS page 137).***

- The plume widths and thicknesses are not supported by the data.

- Assigning a single effective porosity (ne) value of 0.15 to represent the entire bedrock volume does not accurately account for heterogeneity within the bedrock and is inconsistent with Site observations. The affect of porosity on contaminant transport within the bedrock was investigated in the RI (page 663), which states, "To simulate a fractured bedrock terrain, Rf [retardation factor] values were generated from porosities ranging from 0.02 to 0.25. The RI concludes that "... a wide range of Rf values could occur in the carbonate aquifer that are very sensitive to aquifer porosity." The uncertainty associated with this value has a major affect on the estimated groundwater TCE mass flux.

- Assigning a single hydraulic conductivity value of 33 ft/day to represent the entire bedrock volume does not accurately account for heterogeneity within the bedrock and is inconsistent with Site observations. Site-specific values of hydraulic conductivity ranged from 0.01 ft/day to 1405 ft/day (RI p. 2015), or six orders of magnitude. The uncertainty associated with this value has a major affect on the estimated groundwater TCE mass flux. EPA acknowledges that its modeling is sensitive, though the sensitivity is not quantified and results are stated as if they are definitive.[8]

- Assigning a single, non-Site specific TCE retardation value of 1.47 ft/day to represent the entire bedrock volume does not accurately account for heterogeneity within the bedrock and is inconsistent with Site observations. The RI states that "... a wide range of Rf [retardation factor] values could occur in the carbonate aquifer that are very sensitive to aquifer porosity." (RI page 663). The retardation factor value of 1.47 is outside of the range presented in the RI of 1.57 to 11.28 (RI page 663). The uncertainty associated with this value has a major affect on the estimated TCE mass flux. For example, if the arithmetic average of the range presented in the RI (6.4) is used to calculate the TCE mass flux (keeping all other parameters constant) the original TCE mass flux of 310 pounds/year is decreased by 77% to 72 pounds/year.

129) ***Table A-4. Estimated TCE in Soil and Groundwater (FS page 139).***

- The plume widths and thicknesses are not supported by the data.

- As discussed above, the data do not support an average soil concentration of 6,300 ug/kg to a depth of 100 ft. The characterization of ANC A is based on five

[8] For example, at page 2003 of the FS, EPA shows a sensitivity of plus or minus 50%. That aspect of the modeling results needs to be factored into the FS considerations and remedial conclusions.

samples presented in Figure 2-1 of the FS Report: PVANC25, PVANC32, PVANC33, PVANC39, and PVAC106. The sample depths exceeding PRGs for these five locations are presented in Figure 1-3 of the FS Report. The full dataset for these locations is presented in the RI pages 139-140 and 165-170. The deepest sample detected above PRGs was found at 15 feet. Only one location, PVANC39, was sampled below 15 feet. At this location, concentrations of 110 and 29 ug/kg were observed at depths of 16 and 81, respectively. In the northern portion of ANC A, the arithmetic average concentration from 15 ft to 81 ft (deepest sample collected) is less than 100 ug/kg [15ft: PVANC32=260 ug/kg, PVANC33=7 ug/kg, PVANC39=13 ug/kg; 16ft: PVANC39=110 ug/kg; 81ft: PVANC39=29 ug/kg.]

- The area of ANC A is reported as 28,000 square feet. The basis for this number is identified on page 134 as FS Report, Figure 2-1. On Figure 2-1, the area exceeding PRGs for Area A is identified. Using the scale presented on this figure, the area is approximately 18,653 square feet [area of ellipse = length x width x pi / 4 = 237.5 ft x 100 ft x pi / 4 = 18,653 ft^2].

All of the modeling comments demonstrate the weaknesses of EPA's modeled conclusions about mass and mass flux. It is these problematic EPA conclusions which have been used to rationale the FS remedial evaluation. As demonstrated here, EPA should not have disregarded actual data and relied on assumption in formulated remedial options. Its approach does not meet NCP requirements.

Draft Proposed Plan
OU1 Area

EPA issued its draft Proposed Plan on July 27, 2005 with a public comment period ending on August 26, 2005. That comment period was subsequently extended to September 26, 2005. Therefore, the comments presented herein must be considered timely submitted and must be included within the official administrative record for the "Pohatcong Valley Ground Water Contamination Site." The draft Proposed Plan is based on EPA's RI/FS for the Site so the comments on those documents included herein are relevant to the draft Proposed Plan as well and are incorporated herein by reference as Proposed Plan comments.

130) ***Page 2, first column under the heading Soil*** – EPA states that the Agency's and NJDEP's preferred soil remediation alternative is SO3 involving Dual Phase Extraction and limited shallow soils excavation. In support of this proposed remedial selection, EPA concludes that SO3 will "minimize leaching of TCE to ground water, prevent risks from direct contact and limit erosion of contaminated soils." However, as to assumed area ANC C, the building would minimize any leaching and prevent direct contact with sub-building soils. Erosion is prevented by the building as well. Therefore, since EPA's stated remedial goals have already been achieved as to assumed area ANC C, no further soils action is needed with respect to that area. This aspect of the proposed remedy should be eliminated.

On page 12 of the Proposed Plan, EPA acknowledges that SO2, which entails capping and institutional controls, would meet site-specific ARARs at a much lower cost then the proposed SO3. Therefore, SO2 is the more appropriate remedial approach in this instance.

131) ***Page 3, third full paragraph*** – In this paragraph, EPA reviews its process of elimination from the 107 originally identified possible source areas to three. EPA fails to note that of the 107 originally identified, some were eliminated on the basis of a few soil gas samples or a couple of soil samples. None were thoroughly investigated prior to EPA's decision to delete them as possible source areas.

132) ***Page 4, fifth full paragraph*** – Here EPA makes the statement that:

> "It should be noted that a greater amount of TCE contamination has been detected in groundwater than could be accounted for entirely from the two ANC soil source areas identified."

First of all, there are not "two ANC soil source areas identified." EPA assumes that ANC A is from the former ANC property; no data exists to confirm that conclusion. In fact, presently available data indicates that the former ANC property is <u>not</u> the source of impacts at ANC A.

Secondly, having reached this conclusion about the insufficiency of sources on and near the former ANC property, EPA does not look elsewhere for possible sources of TCE impacts. Instead, EPA simply creates a source area (in the absence of any data), of the necessary size to support EPA's assumptions about the annual contribution of TCE to the plume. EPA places that assumed source beneath the former ANC plant building speculating that TCE found in shallow soils (none beneath 6.5 feet) in AOC 7 represents part of a larger impacted area. That view ignores data which defined the extent of TCE as stopping at the building edge rather than continuing beneath the building. It also ignores the fact that data from AOC 7 does not show TCE deeper than 6.5 feet on the former ANC property. This approach also ignores the finding of TCE impacts upgradient of the former ANC property, as well as the likelihood of TCE sources at other locations such as the Vikon Tile, Five Carp Company or Tung-Sol properties.

133) ***Page 4, third full paragraph*** – In this paragraph, EPA lists the numbers of samples it collected from various media within the Site. However, the Site is an 8.75 square mile or 5,600 acre area. That means, for example, that EPA took .027 soil samples per acre. Only .071 borings were installed per acre of Site and only .051 ground water samples were collected per acre. This means that for a significant portion of the Site, no samples of either soil or ground water were collected. Yet, virtually the entire Site has been ruled out as possible source areas.

134) ***Page 5, first full paragraph under the heading "Groundwater Contamination"*** – EPA states that TCE has migrated through unconsolidated soils into the regional aquifer. If that is the case, data shows that the former ANC property is not a significant source of the TCE in the regional ground water. For example, EPA has concluded that ANC B extends to a depth of only five feet; ground water is over 100 feet deep. Similarly, sampling at the former ANC property has shown that TCE does not extend deeper than 6.5 feet. Given those data, there is no

evidence that the TCE could have reached the regional aquifer, which is over eighty feet below, through low permeability soils leaving no traces behind.

135) ***Page 5, first full paragraph under the heading "Groundwater Contamination"*** – EPA notes that 2100 ppb of TCE was detected immediately downgradient of the former ANC property. What EPA fails to mention is that detection was on the Vikon Tile property which was reported to have been the site of significant solvent use and liquid waste disposal in its own right. The Vikon Tile operations could be the source of some or all of this TCE concentration. Furthermore, the detection of the 2100 ppb was not "immediately downgradient" of the former ANC property. If EPA's conclusion that the regional ground water flows to the southwest is correct, Vikon Tile is side-gradient to the former ANC property.

136) ***Page 6, first full paragraph*** – This paragraph mischaracterizes the potential risks associated with TCE impacts on domestic residential wells. As pointed out on page 4, EPA screened, tested and evaluated 35 residential wells. Potential risk estimates in excess of EPA target levels were characterized in only 2 wells, located within a relatively small area. The investigation and risk assessment confirm that the area has been widely studied and treated municipal water supplied to eliminate potential exposure risks. Even hypothetical risks from TCE are limited to a small fraction of the area.

137) ***Page 6, third full paragraph*** – This paragraph simply misstates the conclusions of the risk assessment in an attempt to justify the proposed soil cleanup activities at the ANC site. Contrary to the representation made here, the risk assessment states (in reference to the ANC site) that "there are no hazards or risks above EPA target levels based on samples collected at the site for current site use, or future industrial use (p 561)." Even for other hypothetical future uses, including residential, there are no cancer risk estimates in excess of the EPA target range for ANC soils. Further, TCE and other contamination associated with industrial use play no role whatsoever in the risk profile for soil.

The only significant risk estimates are calculated for naturally occurring metals, with the highest risks ascribed to iron. EPA goes out of its way in the RI and risk assessment to point out that iron and other natural soil minerals are likely to be present due to natural background conditions, and that the calculated risk estimates reflect the intentional protectiveness of the exposure and toxicity assumptions used in quantitative risk assessment. Then the characterization in this paragraph of the Proposed Plan states, "the hazards and risks associated with these areas are primarily from the inhalation of TCE vapors...." There were NO significant risks calculated in association with proposed soil remediation areas pertaining to TCE vapors, much less were any risk estimates driven primarily by this compound. The risk assessment indicates relatively modest potential risk estimates relating primarily to natural background minerals in specialized hypothetical exposure scenarios, yet the Proposed Plan attempts to justify the soil cleanup on the basis of TCE vapor risks. This misrepresentation is inappropriate and clearly inconsistent with CERCLA and the NCP.

The text goes on to state, "the primary human exposure pathways for TCE in soils are direct contact with soils, or inhalation of vapors from the unsaturated zone soils," implying that such exposures represent significant risks in this case. Again, this is categorically contradicted by the risk assessment results purported to back up the proposed soil remedy. TCE was eliminated from consideration in some pathways because soil concentrations were not even detected and eliminated from consideration in others because the maximum-detected value was below the most stringent EPA screening level. Further, in the few pathways where TCE levels were sufficient to warrant quantitative risk assessment, the results clearly show that this compound was not quantitatively significant in the calculation of the risk estimates and was present at concentrations well below the cancer and non-cancer risk targets. PCE was never even included in any quantitative risk estimates for soil in the proposed cleanup areas.

Despite the clear findings of the risk assessment that TCE and PCE are not important factors in potential risks related to soil, the proposed plan juxtaposes the quote above with a poorly characterized description of effects from TCE and PCE intended to further substantiate the proposed soil remedy by highlighting the hazards of chemicals that were not even important to the soils risk assessment outcome. The potentially significant soil risks were limited to hypothetical future use scenarios and driven primarily by iron, aluminum and manganese present, per EPA repeated characterizations, as part of the natural mineral content of the area.

138) ***Page 6, column 2*** – The descriptions of potential health effects from risk driving chemicals are incomplete and, with regard to TCE and PCE, substantially inadequate. Descriptions of potential health concerns in a Proposed Plan are expected to correspond to the chemicals driving the estimated risks in the area as defined in the RI. In this case, no information on any of the chemicals relevant to potential soil exposure (e.g., iron, aluminum, etc.) is presented and only information on TCE and PCE is included. Roughly equivalent coverage of all chemicals purported to be primary risk drivers should be incorporated.

Further, the descriptions provided regarding TCE and PCE do not make clear the vast differences in exposure dose relevant in this situation. Descriptions of effects from exposure to high levels of TCE and PCE vapors and in drinking water are provided, implying that such exposure levels could be relevant. While in one reference the text specifies "large amounts of TCE (greater than what has been detected at the site)," in other references, particularly with regard to inhalation, the non-specialist reader is given no context to understand that the "high concentrations" and "small amounts" of TCE referred to are not only outside the range relevant to the Site, but many hundreds to many thousands of times higher than concentrations associated with the Site. In each paragraph, a rough, order of magnitude expression of the relevant doses being described and, importantly, a contrast with the soil, water, and estimated airborne concentrations associated with the Site must be included to clarify the typically vast safety factor between the environmental levels and the levels needed to produce the acutely poisonous effects described.

139) ***Page 7, paragraph under heading "Remedial Action Objectives"*** – EPA estimates that 163,000 cubic yards of soil have to be treated to achieve the Remedial Action Objectives. That estimate is based on a series of unsupported assumptions, perhaps the greatest of which is the existence of ANC C. Not only has EPA assumed the existence of this source area, but the Agency has proscribed dimensions and now a soil volume to the area. In addition, EPA has assumed the lateral extent of ANC B since only one sample location exists for that area. ANC A's size is also based on inadequate characterization data as to both depth and lateral extent. It is clearly arbitrary and capricious for EPA to set out a proposed remediation for soils only assumed to be impacted.

140) ***Page 8, fifth full paragraph*** – In this paragraph, EPA acknowledges that it has simply presumed ANC C into existence. EPA agrees that it has not identified sufficient TCE contamination at the former ANC property to explain the ground water conditions at the Site. When EPA did not find a source area for the PCE plume, it assumed that the source area no longer existed and did not propose soil remediation. Here, EPA takes a different tact, assuming a source of a size-certain exists, and seeking remediation of its assumed sources. No explanation of the inconsistency in these approaches is provided by the Agency.

141) ***Page 9, Soil Alternatives*** – The soil alternatives should each be reviewed and the potential risk reduction and required risk management should be re-stated consistent with the lack of any significant risks from TCE, PCE or other non-background chemicals. Where there are no significant risks, the costs and difficulties of soil management strategies are not justified since they do not serve the required CERCLA and NCP FS criterion of controlling relevant risks.

142) ***Page 10, Groundwater Alternative GW2*** – As reported by the National Academy of Science ("NAS") in the report titled *Alternatives for Ground Water Cleanup (1994)*, the effectiveness of this technology (groundwater pump and treat) on contaminated aquifers seems quite limited. This has led to a widely held view that pump and treat technology should be rejected as a technique for groundwater remediation. EPA fails to recognize the limitations of groundwater pump and treat, especially when the potential exposure to humans is already managed through alternative water supplies. EPA has also failed to address the particular inappropriateness of a traditional pump and treat approach in karst.

143) ***Page 14, under heading's Implementability: Soils*** – In this paragraph, EPA describes the implementability difficulties associated with three possible remedial alternatives for soils. The only item cited for SO2 is the need to design storm water controls. In contrast SO3 and SO4 have issues as to storm water control on a temporary basis, as well as the adequacy of soil fracturing to allow treatment. EPA concludes that SO3 is easier to implement than SO4, but overlooks the fact that SO2 is the easiest alternative of the three to effectively perform. While recognizing the fact that the soil remedy will have some level of impact on the present company operations, EPA does not consider the cost of those impacts in evaluating the cost of the selected remedy (Page 15, Item 7). Most importantly, EPA fails to consider that most of the soils it proposed to remediate are only assumed to be impacted.

144) ***Page 16, fourth full paragraph*** – EPA states that the preferred alternative would reduce risk within a reasonable time frame and at comparably less cost than other remedies. However, this statement does not recognize that studies (NAS, 1994) show that pump-and-treat systems may be unable to remove enough contamination to restore the ground water to drinking water standards, or that removal may require a very long time, in some cases centuries. The cited NAS report states that, as the complexity of the site increases, the likelihood that the pump-and-treat system will meet drinking water standards decreases. EPA also recognizes that it may be impracticable to actively restore ground water. In development of the technical impracticability guidance, EPA has conducted studies, issued guidance, and prepared policy interpretations focusing on ground water remediation systems and site conditions (i.e., factors) that limit ground water restoration potential (i.e., the likelihood that remediation will achieve ARAR- or risk-based cleanup levels). As noted in the December 21, 1988, Federal Register (53 FR 51434), EPA described four site conditions that could inhibit ground water restoration: Aquifers with fractured bedrock or karst formations, consistent with the conditions at Pohatcong Valley Groundwater Contamination Site are one of the site conditions that could inhibit groundwater restoration cited by the Agency. Nevertheless, here EPA has concluded that a groundwater pump and treatment remedy would be effective in achieving the stated goals. In addition, EPA labels it more effective than monitored natural attenuation, based on the minimal difference of 4 years to achieve the identified remedial goal through this late alternative. (Table 5-2 of the FS).

Transcript of August 4, 2005
Public Meeting on Proposed Plan

PPI first received the transcript of the Proposed Plan public meeting on September 13, 2005. Therefore, its opportunity to comment on statements made to the public by the Agency was limited to a twelve day period. At the August 4th public meeting, representatives of the EPA reiterated many of the erroneous statements contained in the Proposed Plan and RI/FS commented upon above. Therefore, those comments are incorporated herein as pertinent to the public meeting as well.

145) ***Page 11 of Transcript*** – Murray Rosenberg contractor for EPA, states that the highest TCE concentrations in the Pohatcong Valley were immediately downgradient and adjacent to the former ANC facility. That is incorrect. The concentration Mr. Rosenberg is referring to was detected in a sampling point on the Vikon Tile property. That property and the well where the highest detection of TCE was encountered are not "immediately" downgradient of the former ANC facility. The Norfolk Southern property and portions of the Warren Lumber Yard are located between the two properties. In addition, Vikon Tile is actually sidegradient to the former ANC property based on EPA's own analysis.

Further, in light of the complex nature of the hydrogeology in the Pohatcong Valley and the lack of detailed hydrogeologic analysis by the EPA in its proposed source area, there is no basis to conclude that the Vikon Tile groundwater finding is linked to the former ANC property, or the groundwater beneath it. No concentration approaching the 2100 ppb found at Vikon Tile has been detected in groundwater at the former ANC property. The Vikon Tile property itself

has a history of significant solvent usage and disposal, and is the most likely source of the noted groundwater impact. This history was not mentioned during the public meeting. In fact none of the likely alternative sources of TCE were discussed during this public meeting, leaving the public with the mistaken impression that the former ANC property is the only possible source.

146) ***Page 12 of Transcript*** – Here again, Mr. Rosenberg refers to the finding of 2100 ppb in groundwater at the Vikon Tile property. He again terms that property "immediate downgradient." Assuming he is again referring to a location downgradient of the former ANC property, please see our comment 145 above.

147) ***Page 15 of Transcript*** – EPA states that the highest soil concentration detected was 52 ppm in Area A. The samples where TCE was detected in Area A are <u>not</u> on the former ANC property. Nor is there any basis, as reviewed in our comments on the RI/FS, to conclude that the TCE found in soils in Area A is attributable to former ANC operations. (*See* Comments 20, 26, 31 and 42 above).

On this same page, EPA also notes the detection of 400 ppm in soils in the area of the former ANC property. EPA fails to mention that this TCE was detected in a shallow soil sample (1.4-1.9 feet below grade) and that extensive investigations of soil in the area showed no evidence of any TCE below a depth of 6.5 feet below grade. Further, other detections of TCE were significantly lower than 400 ppm. In addition, the Agency should note that the small area of contaminated soil, including the location of the sample where TCE was detected in this area, was remediated.

148) ***Page 19 of Transcript*** – EPA stated that the risks due to groundwater impacts are "considered to be site-wide because the plumes are more or less site-wide." That is both an oversimplification and a misuse of EPA's own risk assessment. The risks from groundwater impacts differ from place to place within the Pohatcong Valley due to both the provision of treated water and the varying concentrations of constituents found. To say that all 8.75 square miles of groundwater presents the same level of carcinogenic risk is simply inaccurate. This is especially true given the karstic nature of the geology in the Valley.

149) ***Page 23 of Transcript*** – On this page, EPA identifies dual phase extraction as its preferred soil remedy. EPA has no basis for a determination that dual phase extraction is necessary or appropriate in these low permeability soils with the groundwater concentrations that have been identified.

150) ***Page 26 of Transcript*** – EPA refers to a 500 ppb line on a map shown at the public meeting. The implication here is that all the groundwater within that line has in excess of 500 ppb of TCE in it. That is not true. Some wells within this line have much lower TCE concentrations. In addition, EPA fails to note that the TCE concentrations in wells that have been sampled multiple times have varied considerably, suggesting that the concept of a constant 500-ppb isoconcentration line that was presented by the Agency is over-simplistic and based on a single snapshot of the aquifer taken in 2002.

On this same page, EPA states that the remedy would include three extraction wells along the downgradient edge of the source area near the former ANC facility. The location of the proposed extraction wells presented in the FS is actually well to the south of EPA's proposed source areas and is not properly characterized as being "along the downgradient edge of the source area." The three wells are located approximately 500 feet south of possible Source Area A, 1200 feet south of the hypothetical Source Area C and more than 600 feet south of the southern most part of the ANC facility. In the complex hydrogeology that exists in the Pohatcong Valley, the proposed placement of these extraction wells is guess-work at best.

151) ***Page 28-29 of Transcript*** – On these pages, EPA mischaracterizes the TCE findings at the former ANC property. TCE was found in only two of over twenty AOCs investigated on that property. In these two areas, the TCE was confined to soils less than 6.5 feet deep on the former ANC property.[9] No TCE was found at a depth of 30 feet on the former ANC property. Later in the transcript, Mr. Cipot refers to TCE "throughout the American National Can." As noted, that is untrue. The vast majority of the former ANC property was found to be TCE-free. In fact, in the RI/FS, EPA acknowledged that it had not found sufficient TCE source on or near the former ANC property to explain the groundwater conditions at the Site. To now attempt to characterize the former ANC property as having extensive TCE soil impacts is contrary to the data and inconsistent with the intent of public participation under the NCP.

On these pages, EPA also mischaracterizes the ground water conditions beneath the former ANC property. As noted above, no perched ground water has been detected beneath the former ANC property. (*See* comment 10) The findings EPA alludes to here were from other properties and are not consistent with the subsurface of the ANC property as defined by actual borings. PPPI does agree that any perched water is localized as stated by EPA. Given that localized nature, it is clearly inappropriate to attribute perched water found on one property to another property. This is particularly true when the properties have different topographies and boring locations may be a hundred or more feet apart as is true for the area surrounding the former ANC property.

152) ***Page 30 of Transcript*** – Here EPA concludes that the former ANC property is "definitely the center of contamination." However, that conclusion is based on numerous inaccuracies. Soil data is overlooked and non-ANC soils are assumed to be on the former ANC property. Soil impacts identified as being on other properties are assumed to be residuals from the former ANC properties. Perched groundwater has been assumed to exist beneath the former ANC property despite borings which demonstrate its absence. Upgradient detections of TCE in the ground water are disregarded. Possible sources such as Vikon Tile, the Norfolk Southern property and past uses of AC 1 itself are ignored. EPA has repeated the mistakes of its RI/FS and Proposed Plan and made the "data" fit its preferred scenario instead of selecting a preferred remedy to address the actual data.

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[9] In one sample associated with AOC 7, TCE was found at 8.5 feet. However it was not found in samples deeper than that. That sample was <u>not</u> on the former ANC property.

153) ***Page 30-31 of Transcript*** – On these pages, EPA also alludes to various drains at the former ANC facility, and then goes on to say that they have sampled a number of drains from the facility. First, there is no information showing that any drain at the former ANC property is or was a source of TCE to the groundwater or soils on adjacent properties. Sampling of AOCs relating to building drains under the ISRA program did not detect significant concentrations of TCE. (*See* also comment 70 above.)

As to EPA's statements on the drains (referred to elsewhere as AOCs 16 and 17), those are storm drains, not process drains. With respect to the TCE findings cited, the concentrations are significantly lower than those found in regional groundwater, indicating that these drains cannot be significant sources of contamination. Since the NJDEP does not include these areas as potential sources, it appears that the State Agency agrees that they are not source areas. (*See* comments 31, 42, 44 and 71 above.)

154) ***Page 32 of Transcript*** – EPA again states that the TCE plume is in a steady state. The information to make such a statement is not available. (*See* comments 46, 91 and 120.)

155) ***Page 41-42 of Transcript*** - EPA makes a comparison between two potential groundwater remedies that are estimated to require 47 and 55 years to achieve their remediation goals. In this comparison, EPA notes that the selected remedy, which requires 55 years, does not require a significantly greater period of time than a remedy that is estimated to require 47 years. EPA notes that the additional cost for a possible 7 years reduction in the time required to achieve their remediation goals would cost a disproportionate amount (about 26 million dollars rather than 8 million dollars for the proposed remedy). This equates to a cost of about 2.6 million dollars for every additional year that the remedial action goals have been achieved.

In this discussion, EPA does not mentioned that they summarily dismissed a natural attenuation remedy in the FS that the Agency estimated would require 59 years to achieve their remedial action goals. The use of the selected remedy that requires 55 years instead of the natural attenuation remedy that requires 59 years equates to a cost of about 2 million dollars for every additional year that the remedial action goals have been achieved (i.e., 4 additional years required to achieve the remedy at a cost of 8 million dollars). Since this analysis used the same model, assumptions and procedures that were used to calculate the time to remediate using other alternatives, it is unclear why the Agency used the data from this model to dismiss a natural attenuation remedy in the FS. The Agency's argument that the difference between 47 and 55 years is insignificant also supports the conclusion that the difference between 55 and 59 years is equally insignificant.

156) ***Page 45 of the Transcript*** – On this page EPA responds to a question from the public by saying that cost is not a factor in selecting a remedial option. Yet the NCP requires consideration of the cost-effectiveness of each remedial option as part of a complete FS. Therefore, either EPA gave the public incorrect information or the Agency violated the NCP requirements in selecting the remedy in the Proposed Plan.

157) ***Page 77-78 of Transcript*** - The estimates of the mass of TCE present in the aquifer and in the supposed source areas are highly speculative and based on technically unjustifiable extrapolations from very few data points (Areas A and B) and no data points (Area C). (*See* comments 33, 127 and 128)

158) ***Page 95 of Transcript*** – On this page, a reference is made to tales of "dumping barrels of contaminants over the river"; we are uncertain as to what river is being referred to. We suspect that the reference is to purported dumping by various entities along the railroad property near Vikon Tile, AC1, the former ANC site, and Warren Lumber Yard. However, in response to this comment, EPA failed to note that repeated investigations have found no drum or barrel disposal at or around the former ANC property related to operations at that property. EPA should have taken this opportunity to reassure the public that drum disposal is not an issue at the former ANC property. In addition, EPA should have noted the possibility that dumping by unknown parties may have caused the TCE contamination seen on the railroad property and elsewhere.

159) Throughout the public meeting transcript, a ground water model developed by USGS is referred to. This model was reportedly specifically developed for EPA's use at the Pohatcong Valley Site. However, the modeling done in the RI/FS and relied upon in the Proposed Plan used a completely different model that was woefully inadequate to address the acknowledged complexities of the aquifer. No explanation is provided as to why the USGS model that appears to be significantly more sophisticated than the model used by the Agency was not used despite the fact that statements made during the public meeting indicate it was available.

160) The transcript of the public meeting also describes the EPA proposed pump and treat remedy for the groundwater. However, no mention is made of the karst-nature of the geology. EPA's own guidance documents view pump and treat as inappropriate in a karst setting. This essential point should have been noted to the public to facilitate their review of EPA's RI/FS and Proposed Plan.

Conclusion

For all of the reasons reviewed above, EPA's RI/FS and resultant draft Proposed Plan do not meet the applicable statutory standard of being "not inconsistent" with the NCP. EPA has acted arbitrarily and capriciously in issuing a draft Proposed Plan based on an RI which did not define the "nature and extent of the threat presented by the release." (*See Washington State Dept. of Transportation v. Washington Natural Gas Company, PacifiCorp*, 59 F3d 793 1995). It is well established that EPA's failure to adequately investigate a site prior to remedial selection is arbitrary and capricious. *State of Minnesota v. Kalman Abrams Metal, Inc.* 155 F3d 1019 (8th Cir. 1998) and *W.R. Grace & Co. v. EPA,* 261 F3d 330 (2001). In this instance, EPA has

admitted its failure to find the TCE source and has therefore proposed a remedy for sources presumed to exist. Clearly such action by EPA is arbitrary and capricious.[10]

> 40 CFR 300.430(d) states that the purpose of the RI is:
>
> ". . . to collect data necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives (emphasis added).
>
> and
>
> . . . shall characterize the nature of and threat posed by the hazardous substances and ... gather data necessary to assess the extent to which the release poses a threat . . ."(emphasis added)

The NCP goes on to say that the RI shall define:

> (iii) The general characteristics of the waste, including quantities, state, concentration, toxicity, propensity to bioaccumulate, persistence and mobility.
>
> (iv) The extent to which the source can be adequately identified characterized.

The emphasis here is on data collection, not speculation or calculations based on assumptions that ultimately result in admittedly hypothetical source areas with assumed sizes and assumed exposure pathways.

The NCP also requires an FS based on site-specific conditions well integrated with the RI. Here the FS is flawed because it is dependent on an inadequate RI. The draft Proposed Plan is in turn fatally flawed due to its reliance on both the deficient RI and the consequently incomplete FS. Selection of a proposed remedy based on unknown sources and oversimplified ground water concepts places EPA at risk of adopting a non-cost-effective remedy in contravention of the NCP. (*See Lone Pine Steering Committee v. EPA*, 600 F. Supp. 1487 (D.N.J.) aff'd 777 F.2d 882 (3d Cir. 1985). The underlying purpose of these regulatory and judicial requirements is the creation of a sufficient record to allow informed judicial review of Agency remedial decisions. In this instance, the RI/FS and Proposed Plan provide no such record.

The public meeting on the proposed plan repeated the issues prevalent in the RI/FS and Proposed Plan. During that meeting, EPA repeated many of the oversimplified and/or erroneous conclusions presented in its documents. The information provided to the public to justify the Proposed Plan influences the publics' responses and the adequacy of the public participation opportunity during the comment period. In this instance, public participation was virtually

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[10] The arbitrary and capricious nature of EPA's actions in proposing a remedial action for the Pohatcong Valley OU1 also has implications for any future cost recovery EPA may hope to pursue. (See for example, *State of Minn. V. Kalman*, 155 F.3. 1019).

precluded by EPA's selective use of data, disregard of Site hydrogeology and failure to comply with NCP requirements in its oral statements and the RI/FS and Proposed Plan.

As we have consistently communicated to EPA, PPPI remains willing to discuss conditions at the former ANC property and address any legitimate remaining concerns in a technically appropriate manner. Our significant concerns with the RI/FS and Proposed Plan as expressed in the comment letter do not detract from PPPI's interest and willingness to resolve this matter in a cooperative manner if possible. We remain interested in speaking with EPA to explore resolution of this matter, preferably in advance of issuance of a ROD for the Pohatcong Valley Groundwater Site OU1.

Very truly,

Barbara Magel

BAM:sam
enclosures
cc: Stephen Cipot – via Federal Express
Project Manager
smpoha11

ATTACHMENT E

PUBLIC MEETING SIGN IN SHEET

POHATCONG VALLEY GROUNDWATER CONTAMINATION SUPERFUND SITE
WARREN COUNTY, NEW JERSEY

SIGN IN SHEET

AUGUST 4, 2005

PLEASE PRINT LEGIBLY SO WE CAN MAKE SURE YOUR NAME IS ADDED TO OUR MAILING LIST FOR FUTURE INFORMATION ABOUT THE SITE

NAME	ADDRESS	PHONE NUMBER
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