AMENDMENT TO THE RECORD OF DECISION

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

United States Environmental Protection Agency
Region II
New York, New York
September 2011

DECLARATION FOR THE AMENDMENT TO THE RECORD OF DECISION

SITE NAME AND LOCATION

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

Superfund Site Identification Number: NYD980509285
Operable Unit 1

STATEMENT OF BASIS AND PURPOSE

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

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

ASSESSMENT OF THE SITE

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

DESCRIPTION OF THE SELECTED MODIFIED REMEDY

A ROD signed on March 31, 2000 selected a remedy for the Site, which called for, among other things, the excavation and off-Site treatment/disposal of contaminated soil and sediment, and extraction and on-Site treatment of the contaminated groundwater. This ROD Amendment changes the groundwater component of the remedy. This action represents the final remedy planned for the Site.

The major components of the selected modified groundwater remedy include the following:

- Monitored natural attenuation of groundwater contamination[1] throughout the Site, except in the "MW-19 Area;"

- Long-term groundwater monitoring to verify that the level and extent of groundwater contaminants are declining within the timeframe projected and that conditions are protective of human health and the environment; and,

- Periodic monitoring of nearby residential private wells to ensure the effectiveness of the selected remedy.

In addition, biodegradation parameters (*e.g.,* dissolved oxygen, nitrate, sulfate, methane, ethane, ethene, alkalinity, redox potential, pH, temperature, conductivity, chloride, sulfide, iron, and total organic carbon) will be used to assess the progress of the degradation process.

MW-19 Area groundwater is located in an approximately 120 feet (ft) by 80 ft by 30 ft deep technical impracticable zone and is depicted on Figures 2 and 3 of the ROD Amendment. The chemical-specific applicable or relevant and appropriate requirements are waived in this zone for tetrachloroethene, 1,1,1-trichloroethane, 1,1-dichloroethane, cis-1,2-dichloroethene, and vinyl chloride.

Under this remedy, the installation and use of groundwater wells at the Site for drinking water purposes are prohibited by an existing deed restriction. Also under this remedy modification, the groundwater cleanup goals remain the same as in the 2000 ROD, except to the extent they are waived.

The Site is zoned residential and is currently vacant. If, in the future, structures are proposed to be built on the property, then a soil vapor intrusion evaluation and, potentially, vapor mitigation may be needed, or alternatively just soil vapor mitigation. As a governmental institutional control, the Office of the Town of Fenton Building Inspector has acknowledged to EPA that such office will notify any person seeking to build residential structures at the Site of soil vapor concerns relating to the property, and specifically of the need for a soil vapor evaluation and potentially, soil vapor mitigation systems or, alternatively just soil vapor mitigation.

The soil and sediment component of the remedy selected in the 2000 ROD is not being modified by this ROD Amendment. The soil and sediment component of the remedy

---

1 Natural attenuation describes a variety of *in-situ* processes, which under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. Groundwater monitoring would be conducted to assess the progress of the natural attenuation.

was completed in 2003. Under this action, approximately 75,000 tons of contaminated soil and sediment were excavated and disposed off-Site.

DECLARATION OF STATUTORY DETERMINATIONS

The selected modified groundwater remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. §9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants, which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws, except where the ARAR is waived; 3) is cost effective; and 4) provides long-term effectiveness.

Because the selected modified groundwater remedy will result in contaminants remaining on-Site that exceed acceptable health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by the review, additional actions may be implemented.

ROD DATA CERTIFICATION CHECKLIST

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

- Contaminants of concern and their respective concentrations (see ROD Amendment, pages 6-7);
- Current and reasonably-anticipated future land use assumptions and current and potential future uses of groundwater used in the baseline risk assessment and ROD Amendment (see ROD Amendment, pages 8-9);
- Baseline risk represented by the contaminants of concern (see ROD Amendment, pages 9-12);
- Cleanup levels established for contaminants of concern and the basis for these levels (see ROD Amendment, Appendix II, Table 10);
- Key factors used in selecting the modified remedy (*i.e.*, how the selected modified groundwater remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)(see ROD Amendment, pages 21-26);
- Key factors used in technical impracticability for the MW-19 Area (see ROD Amendment, pages 26-27); and,

- Estimated capital, annual monitoring, and present-worth costs; discount rate; and the number of years over which the modified groundwater remedy cost estimates are projected (see ROD Amendment, page 23 and Appendix II, Table 11).

AUTHORIZING SIGNATURE

Walter E. Mugdan, Director
Emergency and Remedial Response Division

9/27/11
Date

RECORD OF DECISION FACT SHEET
EPA REGION II

Site

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

Amendment to the Record of Decision

Date signed:	September 27, 2011
Selected remedy:	Monitored natural attenuation of Site groundwater excluding the area covered by a technical impracticability waiver (MW-19 Area)
Capital cost:	$65,600
Annual monitoring cost:	$134,800
Present-worth cost:	$1,774,000 (7% discount rate for 30 years)

Lead

EPA

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

Main PRPs

See ROD Amendment Appendix VI – Settling Defendants

Waste

Waste type:	Volatile organic compounds and metals in groundwater
Waste origin:	Industrial waste containing hazardous substances remaining in drums that were sent to the Site for reconditioning
Contaminated media:	Groundwater

AMENDMENT TO THE RECORD OF DECISION
DECISION SUMMARY

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

United States Environmental Protection Agency
Region II
New York, New York
September 2011

TABLE OF CONTENTS

ATTACHMENTS

SITE NAME, LOCATION, AND DESCRIPTION

The Tri-Cities Barrel Superfund Site (Site), which is listed on the NPL, includes a 14.9-acre parcel which became contaminated through operation of a drum and barrel reconditioning business. Operations at the Site included the receipt and reconditioning of drums and barrels previously used to contain a variety of substances used in industrial or commercial processes. Wastewater from the reconditioning process was discharged to the ground or into unlined lagoons on the Site. The Site is situated adjacent to Old Route 7, approximately five miles northeast of the City of Binghamton, in the Town of Fenton, Broome County, New York and is bisected by Interstate Highway 88 (I-88). The Site is bordered to the north by Osborne Creek and by rural residential areas, farmland, and woodlands on the other sides. The property is presently zoned residential/agricultural; the industrial use of the property was a nonconforming use (*i.e.,* the drum reclamation facility was permitted to continue operating after a zoning ordinance that would have prohibited such industrial use had been established for this area). The current land use in the immediate vicinity of the Site is residential, agricultural, and recreational[2].

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

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

A man-made pond (a former lagoon) located north of I-88 occupies approximately 6,000 square feet (sq ft). However, the size of the pond varies greatly with seasonal precipitation, and is often dry or nearly dry during the summer months. The pond covers the greatest amount of land surface and is deepest (2-3 ft) during the spring. Currently, the pond receives water from precipitation directly into the pond and storm water runoff from I-88 and the area between I-88 and the pond.

---

2 The Tri-Cities Barrel Potentially Responsible Party Group (PRP Group) obtained a deed restriction from the current property owner to restrict the use of the property in perpetuity, recorded in the Broome County Clerk's Office, State of New York, Book of Deeds No. 01875 at Page 1044.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

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

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

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

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

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

A PRP search conducted by EPA in 1991 resulted in the initial identification of 23 PRPs for the Site. In May 1991, EPA notified these parties that it considered them PRPs with respect to the Site, and provided those parties with the opportunity to perform a remedial investigation and feasibility study (RI/FS) for the Site under EPA oversight pursuant to an Administrative Order on Consent (AOC). On May 14, 1992, EPA entered into an AOC

with 14 of these parties (i.e., the original members of the PRP Group), under which they agreed to perform an RI/FS to determine the nature and extent of the contamination at the Site and to identify and evaluate remedial alternatives.

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

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

On September 25, 1996, EPA entered into an AOC with 34 PRPs whereby the PRP Group agreed to perform a removal action at the Site under EPA oversight. EPA then issued a Unilateral Administrative Order in December 1997 to eight non-consenting PRPs, directing them to participate in the removal action along with the AOC parties. The objectives of this action were to locate, characterize the contents, and properly dispose of all containers, drums, tanks, and debris located on-site and decontaminate, demolish, and dispose of all buildings and structures. This work was completed in January 1997. Several concrete slabs and building foundations were present after 1997.

Based upon the results of the 1999 RI/FS reports and a February 2000 public meeting, a Record of Decision (ROD) was signed on March 31, 2000, which called for the excavation and off-site disposal of contaminated soil/sediment, backfill of the excavated area with clean fill and the extraction and treatment of contaminated groundwater at the Site.

In 2001, the United States settled with 43 PRPs in a consent decree entered in United States district court. The consent decree required the settling PRPs to implement the design and remedial action for the Site that had been selected by EPA in the ROD. The soil and sediment remedy selected in the ROD was completed in 2003 and resulted in the excavation and off-site disposal of 74,969 tons (40,000 cubic yards) of contaminated soil and sediment. In 2003, the building foundations remaining after the 1997 removal were excavated, decontaminated, cut into manageable sizes, and buried in a clean area on-site in an area that is designated as the "MW-19 Area" and shown on Figure 2. The concrete foundations with visible staining were disposed off-site at a Subtitle D landfill.

To evaluate the potential for natural attenuation of groundwater, an evaluation was conducted during the RI/FS. The results of natural attenuation screening conducted during the RI/FS were inconclusive and because of the lack of important site-specific

information or "evidence" of natural attenuation, including characterization data necessary to quantify the rates of biological degradation processes, it was not possible to develop time frames for the natural attenuation of contaminants in the groundwater.

From 2001 through 2005, seven rounds of groundwater samples were collected as part of an MNA study and documented in the 2007 *Revised Comprehensive Monitored Natural Attenuation Evaluation Report.* The data indicate that the total mass of contaminants had greatly reduced after the removal of the source of the groundwater contamination, vadose zone soil. In addition, the presence of reductive microbial metabolic products indicates that the primary MNA mechanism responsible for the decline is biodegradation. The findings of this effort were also summarized in a PRP Group-prepared 2008 draft focused feasibility study (FFS) report with comparison of MNA to other alternatives such as groundwater pump and treat. After reviewing the draft FFS report, EPA concluded that while MNA may be feasible for the majority of the Site, the data did not demonstrate that MNA would address the groundwater contamination in the "MW-19 Area" (the source of the contamination in this area could not be identified). It was also concluded by EPA that because of the low permeability of the aquifer, groundwater extraction and treatment was not technically viable for the Site.

Based upon the recommendations in the draft FFS report, the PRP Group was directed by EPA to implement an enhanced reductive dechlorination (ERD) pilot-scale treatability study in the MW-19 Area. Following the completion of four rounds of performance monitoring events, the PRP Group submitted a draft Pilot Study Report in January 2010. Based upon its review of the report, EPA requested that the PRP Group perform additional investigation to locate the source and, if located, then perform targeted ERD treatment. The PRP Group performed a supplemental investigation from September through December 2010. This work included the performance of a passive soil gas survey[3], collection of discrete groundwater samples from the silt and sand/gravel zones beneath and around the concrete rubble, permeability testing, and hydraulic conductivity testing. This investigation did not result in the identification of a source of the contamination in the MW-19 Area.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The *Revised Comprehensive Monitored Natural Attenuation Evaluation Report* (ESC Engineering, 2007), *Pilot Study Report (Revision 2)* (WSP Environmental, 2010), *MW-19 Area Supplemental Investigation Report* (WSP Environmental, 2011), *A Risk Assessment for Human Health and Ecological Risks* developed in 2008, *Focused Feasibility Study Report (Revision 2)* (WSP Environmental, 2011), and *2011 Proposed*

3 Forty-seven passive soil gas samplers were installed in 15-ft intervals over the MW-19 Area. The results were used to aid in locating the potential source of 1,1,1-trichloroethane (1,1,1-TCA) and tetrachloroethene (PCE) in MW-19 Area groundwater. 1,1,1-TCA was detected 14 times over the reporting limit and the maximum detected was 832 nanograms. PCE was detected 18 times over the reporting limit and the maximum detected was 6,513 nanograms.

Plan for Remedy Modification for the Site were made available to the public in both the Administrative Record and information repositories[4] maintained at the EPA Docket Room in the Region II New York City office at 290 Broadway in Manhattan and the information repository at the Fenton Town Hall, 44 Park Street, Port Crane, New York. A notice of availability for the above-referenced documents was published in the *Binghamton Press and Sun Bulletin* on Sunday, July 31, 2011. A public comment period ran from July 31, 2011 to August 30, 2011.

On August 16, 2011, EPA conducted a public meeting at the Town of Fenton Town Hall to present the findings of the recent groundwater investigations and FFS and to answer questions from the public about the Site and the groundwater remedial alternatives under consideration.

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

SCOPE AND ROLE OF OPERABLE UNIT

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site. Operable units may address geographical portions of a site, specific site problems, or an initial phase of an action, or it may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site.

This action applies a comprehensive approach; therefore, only one operable unit is required to remediate the Site. The primary objectives of this action are to restore site-wide[5] groundwater quality to levels which meet state and federal drinking-water standards within a reasonable time frame and reduce or eliminate any direct contact or inhalation threat associated with contaminated groundwater.

The action described in this ROD Amendment changes the groundwater remedy selected in the 2000 ROD, but does not alter the objectives except as to those objectives which are waived. All objectives related to soil and sediment remediation identified in the 2000

4 As of August 1, 2011, another repository location has been added for this Site. Fenton Free Library, 1062 Chenango Street, Binghamton, NY.

5 EPA concluded that since the source of the groundwater contamination in the MW-19 Area could not be identified despite multiple investigations, further efforts to try to identify the source would likely be fruitless, and remedial action in the MW-19 Area to address the source or to address the groundwater contamination is not warranted due to technical impracticability from an engineering perspective.

ROD have been met and completed. This action represents the final remedy planned for the Site.

SUMMARY OF SITE CHARACTERISTICS

The Site is underlain by 35 ft (southern portion of the Site, south of Old Route 7) to greater than 60 ft (northern portion of the Site) of unconsolidated deposits, which are brown, silty, and clayey till, with discontinuous thin sand and gravel lenses. The till deposits with sand layers form the unconsolidated water-bearing zone at the Site. Because of the slow recharge observed in the on-site wells and the low hydraulic conductivity of the till, the groundwater present in the till is referred to as a water-bearing zone and does not qualify as an aquifer[6]. Beneath the unconsolidated deposits lies predominantly shale bedrock. Based on over fifteen years of data, it has been concluded by EPA that the contamination in the groundwater at this Site is confined to the shallow groundwater present in the till and sand layers mentioned above.

Within 1,000 ft of the Site boundary, there are nine private drinking water wells[7]. They are all located upgradient or cross-gradient from the Site and installed in bedrock and are not considered potential receptors of affected groundwater.

The affected groundwater at the Site is mainly restricted to the area south of I-88, within the shallow, unconsolidated water-bearing zone; the bedrock aquifer is not contaminated. Prior to the 2003 removal of the contaminated soil, the groundwater plume at the Site appeared to be located in isolated zones within an area approximately 240 ft wide by 500 ft long. The most prevalent volatile organic compounds (VOCs) and their corresponding maximum concentrations detected in the groundwater prior to 2003 soil remediation were toluene (7,500 micrograms per liter (ug/l)), 2-butanone (5,300 ug/l), 1,1-dichloroethane (1,1-DCA) (4,700 ug/l), cis-1,2-dichloroethene (cis-1,2-DCE) (12,000 ug/l), 1,1,1-TCA (310 ug/l), methylene chloride (1,600 ug/l), and vinyl chloride (VC) (21,000 ug/l). The most prevalent semi-volatile organic compounds (SVOCs) and their corresponding maximum concentrations detected prior to 2003 were phenol (6,900 ug/l) and 4-methylphenol (13,000 ug/l). PCBs and pesticides (alpha-chlordane, 4,4'-DDE, and heptachlor) were detected in monitoring wells outside of the VOC plume at relatively low levels of 1.6 ug/l, 0.11 ug/l, 0.03 ug/l, and 0.09 ug/l, respectively. The prevalent metals of concern and their maximum concentrations detected were iron (38,000 ug/l), manganese (15,600 ug/l), antimony (59.2 ug/l), nickel (184 ug/l) and cadmium (15 ug/l). Other metals were at background concentrations in the groundwater.

---

6 Aquifer in this context is a permeable geologic unit that can transmit and store significant quantities of water. The well yield at Site is so low it is measured in milliliters per minute. The Remedial Investigation report referred to the groundwater at the Site as a water-bearing zone and not an aquifer due to the very low yield.

7 The private drinking water wells were sampled by the New York State Department of Health during the RI; no Site-related contaminants were detected. The residential well located closest to the Site was resampled in 2005. Site-related contaminants were not detected.

While the vertical and horizontal extent of the groundwater contaminant plume has not significantly changed since the removal of the source, with the exception of trichloroethene (TCE) which showed a moderate decrease in concentration, the concentrations of other contaminants have dramatically decreased since the removal of the contaminated soil in 2003. In 2010, the most prevalent VOCs and their corresponding maximum concentrations detected in the groundwater are TCE (720 ug/l), 1,1-DCA (160 ug/l), cis-1,2-DCE (270 ug/l), and VC (270 ug/l). 2010 data for toluene, methylene chloride, 2-butanone, and 1,1,1-TCA found previously in the groundwater which had exceeded the New York State Ambient Water Quality Standards (NYS AWQS) prior to the 2003 source removal, were either not detected or were within the drinking water standard for New York State. All of the maximum concentrations detected, except TCE, were from monitoring well MW-3S. Maximum levels of TCE were observed in monitoring well MW-16S. Most of the other wells south of I-88 had TCE at concentrations ranging from 13 to 75 ug/l. Monitoring well MW-16S is located in the former operational area south of I-88 and monitoring well MW-3S is located 140 ft downgradient of monitoring well MW-16S.

Monitoring wells MW-3S and MW-16S are not in the MW-19 Area. Historically, MW-19 Area TCE concentration ranged from non-detect to 1.3 ug/l. A summary of groundwater data since the source removal of 2003 is provided in the Table 1 of Appendix II. Groundwater data from 2010 for all wells monitored are provided in Table 2 of Appendix II.

The relatively low concentrations observed in monitoring wells north of I-88, downgradient of the source areas, suggest that the plume is not highly mobile. For example, the only contaminant of concern (COC) detected downgradient has been VC. The maximum detected concentrations of VC in 2010 were found in two monitoring wells located near the remediated source areas South of I-88 at 68 ug/l and 270 ug/l, whereas the maximum detected concentrations of VC in monitoring wells which are 200 and 300 feet downgradient and screened at similar depths, were 6.8 ug/l and 4.5 ug/l, respectively.

Groundwater data collected after the 2003 source removal detected levels of SVOCs, pesticides, and PCBs below the federal and state drinking water standards. Maximum detected levels of metals which exceeded the federal and state drinking water standards since the 2003 contaminated soil and sediment removal are as follows: iron (6,900 ug/l), manganese (1,600 ug/l), and cadmium (7.9 ug/l).

During the RI/FS, two monitoring wells, MW-14 and MW-14B, and one piezometer, P-2, (see Figure 2) were located in the vicinity of what is now called the MW-19 Area. Only piezometer P-2 showed PCE contamination above the cleanup levels. During the MNA study in 2001, a monitoring well (MW-19) was installed approximately 20 ft easterly of piezometer P-2. Since then, PCE and 1,1,1-TCA have persisted in the MW-19 Area wells with concentration levels ranging from 12 to 66 ug/l and 45 to 72 ug/l, respectively.

Piezometer P-2 has exhibited similar PCE and 1,1,1-TCA contamination levels since 1997. The MW-19 Area plume is estimated to be about 120 ft by 80 ft. The NYS AWQS and the federal standard of Drinking Water Maximum Contamination Level (MCL) for PCE is 5 ug/l. See Tables 1 and 2 for groundwater data.

PRINCIPAL THREAT WASTE

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

Principal threat wastes identified in the 2000 ROD located in the former incoming drum storage area, the former Lagoon 1 area, and within the former process building area were removed with other contaminated soil and sediment in 2003 and treated as appropriate prior to disposal.

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

The property is presently zoned residential/agricultural; the industrial use of the property was a nonconforming use (*i.e.,* the drum reclamation facility was permitted to continue operating after a zoning ordinance prohibiting such use had been established for this area)[8]. The current land use in the immediate vicinity of the Site is residential, agricultural, and recreational. Based on a number of factors, including EPA's observations as to land use in the area of the Site since at least 1989, the existing zoning for the Site property, an August 1999 resolution by the Town Board of the Town of Fenton affirming that zoning[9], and subsequent communications between the Town Board, EPA,

---

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

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

and the PRP Group, EPA determined that the reasonably-anticipated future use for the Site is residential/agricultural.

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

SUMMARY OF SITE RISKS

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

EPA developed an updated baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment following the 2003 implementation of the remedial action which removed source material (soil and sediment). A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under future groundwater uses. The updated baseline risk assessment includes a human health risk assessment (HHRA) and an ecological risk assessment (ERA) that is presented in the 2008 document titled *Future Groundwater Scenario for the Tri-Cities Barrel Superfund Site* (USEPA 2008).

Human Health Risk Assessment

Four-step processes is utilized for assessing site-related human health risks for reasonable maximum exposure (RME) scenarios and are identified below:

Hazard Identification (Data Collection and Evaluation): In this step, the COCs at a site in various media (in this case, contaminants in groundwater) are identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

The 2008 risk assessment used the maximum concentrations from the shallow wells (MW-2S, MW-3S, MW-7S, MW-16S, and MW-20S) collected on December 11 and 12, 2007 to identify the COCs. Based on the results of the baseline human health risk

assessment, the following COCs were identified: 1,1-DCA, 1,2-DCA, cis-1,2-DCE, methylene chloride, PCE, TCE, and VC (see Table 3).

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 ingestion of and dermal contact with contaminated groundwater and inhalation exposures while showering. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a RME scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Potential receptors and exposure pathways were based on current and future land use. The exposure routes were evaluated as appropriate for the potential receptors. See Table 4 for the Selection of Exposure Pathways.

In addition to calculating the risks and hazards to the RME individual, calculations of risks and hazards to the Central Tendency Exposed (CTE) individual are also provided for those chemicals exceeding the risk range.

Toxicity Assessment: In this step, the types of adverse health effects associated with contaminant exposures and the relationship between magnitude of exposure (dose) and severity of adverse health effects (response) are determined. Potential health effects are contaminant 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 contaminants are capable of causing both cancer and non-cancer health effects. Tables 5 and 6 provide a summary of the COCs and their respective toxicity values for carcinogenic and non-carcinogenic health effects.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COCs. 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 identified in the Exposure Assessment. Current Superfund regulations for acceptable exposures are an individual lifetime site-related 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 or less. 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" (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a

non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remediation at the site.

The cancer risk and non-cancer health hazard estimates in the HHRA are based on future RME scenarios and were developed by taking into account various health protective estimates about the frequency and duration of an individual's exposure to chemicals selected as COCs, as well as the toxicity of these contaminants. Cancer risks and non-cancer HIs are summarized below.

The 2008 risk assessment evaluated the health effects for both future children, adults, and on-site workers in a residential setting exposed to direct contact with contaminated groundwater in the shallow wells (e.g., through ingestion of groundwater and inhalation of volatiles released into indoor air from groundwater while showering in an enclosed space). The updated risk assessment began by selecting COCs in groundwater that would be representative of Site exposures and resulting risks.

Based on the 2008 risk assessment, future risks to the adult resident were 6.3×10^{-4} (6.3 additional cancers within a population of 10,000 people based on ingestion of 2 liters/day of shallow groundwater for a period of 350 days/year for 24 years) and to the child resident were 3.6×10^{-4} (3.6 additional cancers within a population of 10,000 people based on ingestion of 1 liter/day for a period of 350 days/year for 6 years). The risks to the combined future adult and child resident are 9.9×10^{-4} (an increased risk of approximately 1 additional cancer within a population of 1,000 based on the exposure assumptions identified above). Risks to the future adult worker were 4.8×10^{-4} (4.8 additional cancers among a population of 10,000 workers assuming ingestion of 2 liters/day for 250 days/year for a period of 25 years). See Table 6 for summary of risks to carcinogens.

The non-cancer hazards based on the same exposure assumptions used in the cancer assessment were approximately HI of 2 for the future adult resident; 4.7 for the future child resident; and 1.4 for the future worker. See Table 8 for summary of non-cancer hazards.

The toxicity values used in the 2008 assessment were evaluated against currently available toxicity values. This comparison found that the toxicity values for TCE and cis-1,2-DCE were revised since the 2008 assessment. The oral cancer slope factor for TCE changed from 1.3×10^{-2} mg/kg-day to 5.9×10^{-3} mg/kg-day which resulted in a change in the calculated risks. This reduction does not significantly change the calculated risks found in the original assessment. A summary of the changes in the cancer risks for all receptors are provided in Table 9.

In addition, the oral Reference Dose for cis-1,2-DCE was revised through the IRIS process. This revision resulted in an increase in the non-cancer health hazard for the future exposures for the child from HI of 2.8 to 14; adult from HI of 0.86 to 4.3; and adult worker from HI of 0.86 to 4.3. These changes in toxicity values do not result in significant changes to the overall conclusions from the risk assessment.

The risks for the future adult and child resident are above the risk range established in the NCP (10^{-4} to 10^{-6}) described above. The risks to the future workers are within the upper bounds of the risk range. The non-cancer hazards exceeded EPA's goal of protection of an HI = 1 for all three receptors (i.e., future adult and child resident, and future on-site worker). The main COCs were VC, TCE, and cis-1,2-DCE. Evaluation of cancer risks and non-cancer hazards associated with showering were within the risk range for all receptors. A complete discussion of the exposure pathways and estimates of risk can be found in the Human Health Risk Assessment Future Groundwater Scenario for the Tri-Cities Barrel Site.

In addition, the assessment also evaluated cancer risks and non-cancer health hazards associated with exposures to the future adult, child and the worker exposed under central tendency or average exposure scenarios. The CTE assessment evaluated risks to a future adult from ingestion of groundwater and inhalation of VOCs while showering and other household uses. The total risks were 7.8×10^{-5} and this calculated risk is within the risk range. The cancer risks to the future child from ingestion of groundwater and inhalation of VOCs while showering and other household uses. The total risks were 1.3×10^{-4} and this risk is within the upper bounds of the risk range. The non-cancer Hazard Indices to the future residential child and adult under CTE scenarios were 3.3 and 1, respectively; however, using the revised toxicity value for cis-1,2-dichloroethylene the Hazard Indices were 11 and 3.4, respectively. The updated non-cancer HI exceed the goal of protection of a HI = 1. The main contributor to the non-cancer Hazard Indices was cis-1,2-dichloroethene. The cancer risks to the future worker consuming shallow drinking water provides the risk to the future adult worker from ingestion groundwater and inhalation of VOCs while showering and other household uses. The total risks to the future worker were 6.5 x 10-5 and are within the risk range. The HI for the on-site worker was 0.71 under the previous toxicity value; however the use of the revised toxicity value resulted in an HI greater than 1 up to an HI of 2.4.

In summary, the greatest potential future carcinogenic risk attributable to the Site is associated with the ingestion of groundwater. The potential cancer risk and non-cancer Hazard Indices are based on current levels of groundwater contaminants.

Ecological Risk Assessment

The potential risk to ecological receptors was evaluated. For there to be an exposure, there must be a pathway through which a receptor (e.g. plant, animal) comes into contact with one or more of the contaminants of potential concern. Without a complete pathway or receptor, there is no exposure and hence, no risk.

Based on a review of existing data, there are no potential exposure pathways for ecological receptors at the Site. As noted above, all of the contaminated soil and sediment have been excavated and disposed of off-site. The depth to groundwater (the

medium of concern) is approximately 30 ft and is unlikely to affect any surface water bodies.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include the following: environmental chemistry sampling and analysis; environmental parameter measurement; fate and transport modeling; exposure parameter estimation; and toxicological data. Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there can be significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources, including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the COCs, the period of time over which such exposure would occur, and the fate and transport models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides upper-bound estimates of the risks to populations near the Site, and it is highly unlikely to underestimate actual risks related to the Site. More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways is presented in the updated 2008 risk assessment.

Basis for Action

Based upon the results of the RI, the risk assessment, and updated 2008 risk assessment, EPA has determined that the action selected in this ROD Amendment is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into 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) for drinking water.

The following RAOs are established for the Site groundwater:

- Restore Site-wide[10] groundwater quality to levels which meet state and federal drinking-water standards within a reasonable time frame; and

- Reduce or eliminate any direct contact or inhalation threat associated with contaminated groundwater.

DESCRIPTION OF ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

The 2000 ROD evaluated three remedial alternatives to address the Site-wide groundwater contamination: no action; MNA; and groundwater extraction and treatment. At that time, there was insufficient data to demonstrate that MNA was occurring at the Site. Groundwater extraction and treatment was selected in the ROD as the most appropriate alternative. As described above, since the ROD, MNA has been evaluated further and now sufficient data exists which demonstrates that MNA is occurring at the Site, except in the MW-19 Area. The *Focused Feasibility Study Report (Revision 2)* (WSP Engineering, 2011) evaluates no action, MNA, and groundwater extraction and treatment.

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site (excluding the MW-19 Area) can be found in the FFS report.

Since the PRP Group effectuated a deed restriction with the current Site property owner to prohibit, among other things, the installation and use of groundwater wells at the Site, this institutional control is considered a component of all of the remedial alternatives described below.

---

10 EPA concluded that since the source of the groundwater contamination in the MW-19 Area could not be identified despite multiple investigations, further efforts to try to identify the source would likely be fruitless, and remedial action in the MW-19 Area to address the source or to address the groundwater contamination is not warranted due to technical impracticability from an engineering perspective.

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

The alternatives described below have been renumbered from the *FFS Report* to facilitate the presentation of the analysis.

Alternative GW-1: No Action

Capital Cost:	$0
Annual Monitoring Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the problem of groundwater contamination at the Site.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented in the future to remove or treat the contamination.

Alternative GW-2: Monitored Natural Attenuation

Capital Cost:	$65,600
Annual Monitoring Cost:	$134,800
Present-Worth Cost:	$1,775,000
Construction Time:	0 months

Under this alternative, the groundwater contamination would be addressed through natural attenuation processes (*i.e.*, biodegradation, dispersion, sorption, volatilization, and oxidation-reduction reactions). As part of a long-term groundwater monitoring program, a performance monitoring plan would be needed to monitor the effectiveness of the MNA remedy.

For cost estimating purposes, groundwater samples were assumed to be collected and analyzed quarterly in order to verify that the level and extent of groundwater contaminants (*e.g.,* VOCs) are declining and that conditions are protective of human health and the environment. In addition, biodegradation parameters (e.g., dissolved oxygen, nitrate, sulfate, methane, ethane, ethene, alkalinity, redox potential, pH, temperature, conductivity, chloride, sulfide, iron, and total organic carbon) would be used to assess the progress of the degradation process.

The capital cost associated with this alternative is for the preparation of a performance monitoring plan. For the present worth cost calculation, a 30-year monitoring time was assumed.

Because this alternative would result in contaminants remaining on-site which exceed acceptable health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by the review, additional actions may be implemented.

Alternative GW-3: Groundwater Extraction and Treatment

Capital Cost:	$792,000
Annual Operation, Monitoring and Maintenance (OM&M) Cost:	$125,000
Present-Worth Cost:	$2,381,000
Construction Time:	3 months

Under this alternative, a network of recovery wells would be used to extract contaminated groundwater which would be treated and discharged to surface water.

As part of a long-term groundwater monitoring program to evaluate the effectiveness of the groundwater extraction and treatment remedy, an OM&M Plan would be needed.

For cost estimating purposes, a 30-year operation time was used and groundwater sampling was assumed to be collected and analyzed semiannually.

Because this alternative would result in contaminants remaining on-site which exceed acceptable health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by the review, additional actions may be implemented.

COMPARATIVE ANALYSIS OF ALTERNATIVES

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

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

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

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

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

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

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

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

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

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

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

8. *State acceptance* indicates whether, based on its review of the Revised Comprehensive Monitored Natural Attenuation Evaluation Report, 2008 FFS report, and Superfund Proposed Plan for Remedy Modification, the State concurs with, opposes, or has no comments on the selected modified remedy.

9. *Community acceptance* refers to the public's general response to the alternatives described in the 2008 FFS report and Superfund Proposed Plan for Remedy Modification.

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

Overall Protection of Human Health and the Environment

Although Alternative GW-3 would rely upon extraction and treatment of contaminated groundwater to restore to groundwater while Alternative GW-1 and Alternative GW-2 would rely upon natural attenuation to restore groundwater quality to drinking water standards, based upon preliminary modeling results, it is estimated that all three alternatives would result in the restoration of groundwater quality to drinking water standards in approximately 50 years. Under Alternative GW-1, however, since monitoring would not be performed, there would be no way to gauge the overall protectiveness of the remedy.

Until groundwater standards are met under all of the alternatives, human exposure to the contaminated groundwater would be mitigated through the existing deed restrictions that would prevent the use of the shallow groundwater for drinking water purposes. In addition, five-year reviews would be conducted at the Site as described above.

Compliance with ARARs

EPA and NYSDEC have promulgated health-protective MCLs, which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). While

contamination from the Site has not been found in any existing private wells in the vicinity of the Site, groundwater contamination at the Site itself presents human health cancer risks for future on-site residents and workers if not addressed by one of the remedial alternatives.

Alternatives GW-1 and GW-2 do not provide for any direct remediation of groundwater and would, therefore, rely upon natural attenuation to achieve chemical-specific ARARs. Based upon groundwater modeling, all three alternatives would be effective in reducing groundwater contaminant concentrations below MCLs. Under Alternative GW-1, however, since monitoring would not be performed, there would be no way to gauge the effectiveness of the remedy in meeting ARARs.

Long-Term Effectiveness and Permanence

Alternative GW-1 and Alternative GW-2 would rely upon natural attenuation to restore groundwater quality to drinking water standards, whereas the Alternative GW-3 would rely upon extraction and treatment of contaminated groundwater to restore to groundwater. Based on modeling results, all three alternatives would result in the restoration of groundwater quality to drinking water standards in approximately 50 years; therefore, the alternatives have similar long-term effectiveness and permanence. Under Alternative GW-1, however, since monitoring would not be performed, there would be no way to gauge the long-term effectiveness and permanence of the remedy.

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

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives GW-1 and GW-2 would rely upon natural attenuation, not treatment, to reduce the volume of contaminants. Collecting and treating contaminated groundwater under Alternative GW-3, on the other hand, would reduce the toxicity, mobility, and volume of contaminants through treatment, thereby satisfying CERCLA's preference for treatment. However, as noted earlier, because of the low hydraulic conductivity of the till, pumping the contaminated groundwater present in the shallow zone at this Site will yield a very small volume. As a result, collecting the contaminated groundwater for treatment would be difficult and inefficient.

Short-Term Effectiveness

Alternatives GW-1 and GW-2 do not include any active remediation; therefore, they would not present an additional risk to the community or workers resulting from activities at the Site. Alternatives GW-2 and GW-3 might present some limited risk to on-site workers through dermal contact and inhalation related to groundwater sampling activities. Alternative GW-3 would pose an additional risk to on-site workers since it would involve

the installation of extraction wells through potentially contaminated groundwater. The risks to on-site workers could, however, be minimized by utilizing proper protective equipment.

Since no actions would be performed under Alternative GW-1, there would be no implementation time. It is estimated that Alternative GW-2 would require a month to implement, since developing a long-term groundwater monitoring program would be the only activity that is required. It is estimated that the groundwater extraction and treatment systems under Alternative GW-3 would be constructed in three months.

Based upon groundwater modeling results, it has been estimated that the contaminated groundwater would naturally attenuate to groundwater standards (under Alternatives GW-1 and GW-2) in 50 years. It is also estimated that under Alternative GW-3, groundwater standards would be met after 50 years of extraction and treatment. Alternative GW-3 is estimated to take as long as the Alternatives GW-1 and GW-2 because of the low yielding shallow groundwater at site.

Implementability

Alternative GW-1 would be the easiest groundwater alternative to implement, since it would require no activities. With the performance of monitoring of natural attenuation parameters to demonstrate that it is reliable in achieving the specified performance goals, Alternative GW-2 would require more effort to implement than Alternative GW-1, but would be easily implemented. Alternative GW-3 would be the most difficult to implement in that it would require the construction of a groundwater extraction system and pipelines. The services and materials that would be required for the implementation of all of the groundwater remedial alternatives are readily available. However, as noted earlier, because of the low hydraulic conductivity of the till, pumping the contaminated groundwater present in the shallow zone at this Site for Alternative GW-3 will yield a very small volume. As a result, collecting the contaminated groundwater for treatment would be difficult and inefficient.

All of the treatment equipment that would be utilized in Alternatives GW-3 are proven and commercially available. Transportation and disposal of treatment residues could be easily implemented using commercially-available equipment. Under these alternatives, sampling for treatment effectiveness and groundwater monitoring would be necessary, but could be easily implemented.

Cost

The estimated capital, annual operation, monitoring, and/or maintenance, and present-worth costs for each of the alternatives are presented below. Present-worth costs are calculated using a discount rate of seven percent and a 30-year time interval.

Alternative	Capital Cost	Annual Cost	Present-Worth Cost
GW-1	$0	$0	$0
GW-2	$65,600	$134,800	$1,774,000
GW-3	$792,000	$125,000	$2,381,000

As can be seen by the cost estimates, the least costly alternative is GW-1 at $0. Alternative GW-3 is the most costly alternative at $2,381,000.

State Acceptance

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

Community Acceptance

Comments received during the public comment period indicate that the public generally supports the selected modified groundwater remedy. These comments are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

SELECTED MODIFIED GROUNDWATER REMEDY

Summary of the Rationale for the Selected Modified Groundwater Remedy

Based upon an evaluation of the various groundwater alternatives, Alternative GW-2, Monitored Natural Attenuation, provides the best balance of tradeoffs with respect to the evaluation criteria as described below. Under this alternative, the groundwater contamination will be addressed through natural attenuation processes (*i.e.*, biodegradation, dispersion, sorption, volatilization, and oxidation-reduction reactions). As part of a long-term groundwater monitoring program, groundwater samples will be collected and analyzed periodically in order to verify that the level and extent of groundwater contaminants (*e.g.,* VOCs) are declining and that conditions are protective of human health and the environment. In addition, biodegradation parameters (*e.g.,* dissolved oxygen, nitrate, sulfate, methane, ethane, ethene, alkalinity, redox potential, pH, temperature, conductivity, chloride, sulfide, iron, and total organic carbon) would be used to assess the progress of the degradation process. The installation and use of groundwater wells at the Site for drinking water purposes will be prohibited by the existing deed restriction. This selected remedy includes an informational institutional control to notify prospective builders of soil vapor intrusion concerns which could be addressed by

soil vapor intrusion evaluation and, if needed, vapor mitigation, or alternatively just soil vapor mitigation.

While Alternative GW-3 would actively treat the groundwater and Alternatives GW-1 and GW-2 would rely upon natural attenuation, it is estimated that it would take 50 years to achieve groundwater standards under all three alternatives. However, as noted earlier, because of the low hydraulic conductivity of the till, pumping the contaminated groundwater present in the shallow zone at this Site will yield a very small volume. As a result, collecting the contaminated groundwater for treatment would be difficult and inefficient. Alternative GW-3 is, however, significantly more costly than Alternatives GW-1 and GW-2. While Alternative GW-1 would achieve the cleanup objectives in the same time frame as the other alternatives and would be the least costly alternative, since monitoring would not be performed under this alternative, there would be no way to gauge the overall effectiveness of the remedy. Therefore, EPA and NYSDEC believe that Alternative GW-2 would minimize the migration of contaminated groundwater at the Site, while providing the best balance of tradeoffs among the alternatives with respect to the nine evaluation criteria.

The selected modified remedy is protective of human health and the environment, provides long-term effectiveness, will achieve the ARARs in a reasonable time frame (except to the extent that they are waived), and is cost-effective. Therefore, the modified selected remedy will provide the best balance of tradeoffs among the alternatives with respect to the evaluation criteria.

Description of the Selected Modified Groundwater Remedy

The major components of the selected modified groundwater remedy include the following:

- MNA of groundwater contamination throughout the Site, except in the "MW-19 Area;"

- Long-term groundwater monitoring to verify that the level and extent of groundwater contaminants are declining within the timeframe projected and that conditions are protective of human health and the environment; and,

- Periodic monitoring of nearby residential private wells to ensure the effectiveness of the selected remedy.

MW-19 Area groundwater is located in an approximately 120 ft by 80 ft by 30 ft deep technical impracticable zone. The chemical-specific ARARs are waived in this zone for PCE, 1,1,1-TCA, 1,1-DCA, cis-1,2-DCE, and VC.

Under this remedy, the installation and use of groundwater wells at the Site for drinking

water purposes are prohibited by an existing deed restriction.

If, in the future, structures are proposed to be built on the property, then a soil vapor intrusion evaluation and, potentially, vapor mitigation may be needed, or alternatively just soil vapor mitigation. As a governmental institutional control, the Office of the Town of Fenton Building Inspector has acknowledged to EPA that such office will notify any person seeking to build residential structures at the Site of soil vapor concerns relating to the property, and specifically of the need for a soil vapor evaluation and potentially, soil vapor mitigation systems or, alternatively just soil vapor mitigation.

The soil and sediment component of the remedy selected in the 2000 ROD is not being modified by this ROD Amendment. The soil and sediment component of the remedy was completed in 2003. During the 2003 action, approximately 75,000 tons of contaminated soil and sediment were excavated and disposed off-Site.

Because the selected modified groundwater remedy will result in contaminants remaining on-Site that exceed acceptable health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by the review, additional actions may be implemented

Summary of the Estimated Modified Groundwater Remedy Costs

The estimated capital, annual (cost to monitor groundwater), and present-worth costs (using a 7% discount rate for a period of 30 years) for the selected modified groundwater remedy are $65,600, $134,800, and $1,774,000, respectively. Table 11 provides the basis for the cost estimate for the selected modified remedy.

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

Expected Outcomes of the Selected Modified Groundwater Remedy

The 2000 ROD called for excavation and off-Site treatment/disposal of contaminated soils and sediments, and extraction and on-Site treatment of the contaminated groundwater. The results of post-soil remediation aquifer testing indicated that the selected groundwater remedy would not be effective in addressing the groundwater contamination. As a result, the remedial alternatives for the groundwater component of the remedy were reevaluated. Land use associated with the Site has been discussed above and is not anticipated to change as a result of the implementation of the selected remedy. However, in the future, if structures are proposed to be built on the property,

then a soil vapor intrusion evaluation and, potentially, vapor mitigation may be needed or alternatively just soil vapor mitigation.

The current action addresses the groundwater. The results of the risk assessment indicate that the hypothetical future use of the groundwater at the Site will pose an unacceptable increased future cancer risk and an unacceptable non-cancer hazard risk to human health. Under the selected alternative, the groundwater contamination would be addressed through natural attenuation and a long-term groundwater monitoring program to verify that the level and extent of groundwater contaminants are declining and that conditions are protective of human health and the environment. Under the selected remedy, the installation and use of groundwater wells at the Site for drinking water purposes would be prohibited by the existing deed restriction

By having had addressed the source material in 2003 and with MNA selected as modified remedy, this will restore the groundwater in the shallow unconsolidated water-bearing zone in a reasonable time frame by reducing contaminant levels to the federal and state MCLs. Also, with the existing deed restriction, the direct contact and inhalation threat associated with the contaminated groundwater is eliminated. Federal and state MCLs are presented in Table 10. Achieving the cleanup levels will restore the aquifer to its beneficial use.

It is estimated that it will take 50 + years to achieve the groundwater cleanup objectives under the selected remedy.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site.

For the reasons discussed below, EPA has determined that the selected modified groundwater remedy meets these statutory requirements, except for the MW-19 Area groundwater where chemical specific ARARs are waived in the 120 ft by 80 ft by 30 ft depth zone for PCE, 1,1,1-TCA, 1,1-DCA, cis-1,2-DCE, and VC.

Protection of Human Health and the Environment

The results of the risk assessment indicate that, if no action is taken, the hypothetical future use of the groundwater at the Site will pose an unacceptable increased future cancer risk and an unacceptable non-cancer hazard risk to human health. The selected

remedy will be protective of human health and the environment in that it will restore groundwater quality at the site over the long term. Combined with institutional controls, the selected remedy will provide protectiveness of human health and the environment over both the short and long term.

Compliance with ARARs and Other Environmental Criteria

A summary of the ARARs and "Other Criteria, Advisories, or Guidance TBCs" which will be complied with during implementation of the selected remedy, is presented below.

- New York State Department of Environmental Conservation Water Quality Regulations for Surface Waters and Groundwater (6 NYCRR Parts 700-705);
- New York State Department of Health Drinking Water Standards (10 NYCRR Part 5); and,
- Safe Drinking Water Act National Primary Drinking Water Standards (MCLs and non-zero maximum contaminant level goals) (40 CFR Part 141).

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP Section 300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness (discussed above) to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost-effective in that it is the least-cost action alternative and will achieve the remediation goals in a reasonable time frame.

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital and annual monitoring or OM&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual monitoring or OM&M costs were calculated for the estimated life of an alternative using a 7% discount rate.

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

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP Section 300.430(f)(1)(i)(B), such that it represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Site. In addition, the selected remedy provides the protection of human health and the environment, provides the long-term effectiveness, is able to achieve the ARARs as quickly as the other alternatives, and is cost-effective.

While the selected groundwater remedy will not actively treat the groundwater, there is an overall downward trend of the contamination in the groundwater plume, and there is currently no exposure pathway to the contaminated groundwater at the Site, because there are no drinking water wells on the Site. The existing deed restriction prohibits installation of new drinking water wells and nearby residences' private drinking water wells are not impacted by contamination from the Site as they are using the deep bedrock aquifer which is not contaminated. In addition, a review of the MNA data shows that natural attenuation is occurring at Site except in MW-19 Area. The selected groundwater remedy will provide a permanent remedy to reduce the toxicity, mobility, and volume of the contaminants in the groundwater over a long-term.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is not satisfied under the selected modified remedy since there is no active treatment of the contaminated groundwater.

Five-Year Review Requirements

Since the selected modified groundwater remedy will allow for hazardous substances to remain at this Site above levels that would allow for unlimited use without restriction, pursuant to Section 121 (c) of CERCLA, EPA or the State will review implemented remedies no less often than every five years. Although the contaminated soil and sediments have been excavated, each five-year review will cover all aspects of the soil and groundwater remedies.

TECHNICAL IMPRACTICABILITY DETERMINATION

The restoration of contaminated groundwater is one of the primary objectives of the Superfund program. Experience at Superfund sites has shown, however, that the restoration of contaminated groundwater may not always be achievable from an engineering perspective.

As was noted in the "Site History" section, above, seven rounds of groundwater samples were collected as part of an MNA study. The findings of this effort were summarized in a PRP Group-prepared report entitled *Revised Comprehensive Monitored Natural Attenuation Evaluation Report* (ESC Engineering, 2007). Based upon its review, EPA concluded that the data did not demonstrate that MNA would address the groundwater contamination in the MW-19 Area. It was also concluded that because of the low permeability of the aquifer, groundwater extraction and treatment was not viable for the Site.

Based upon the recommendations in the 2008 draft FFS report, the PRP Group was directed by EPA to implement an ERD pilot-scale treatability study in the MW-19 Area. Following the approval of a work plan, the PRP Group initiated an ERD pilot test in December 2008. As part of the pilot test, approximately 50 gallons of Hydrogen Release Compound (HRC) and 35 gallons of HRC primer were applied to an 800 sq ft area via eight direct push delivery points. Following the completion of four rounds of performance monitoring events, the PRP Group submitted a report entitled draft *Pilot Study Report* in January 2010. Based upon its review of the report, EPA requested that the PRP Group perform additional investigation to locate the source and, if located, then perform targeted ERD treatment. The PRP Group performed a supplemental investigation from September through December 2010. This work included the performance of a passive soil gas survey, collection of discrete groundwater samples from the silt and sand/gravel zones beneath and around the concrete rubble, permeability testing, and hydraulic conductivity testing. Based on the results of this effort, the PRP Group submitted a draft report entitled *Draft MW-19 Area Supplemental Investigation Repor*t on February 3, 2011. After review of the document, EPA concluded that the source of the PCE and 1,1,1-TCA contamination had not been identified and further efforts to try to identify the source would likely be fruitless. Nevertheless, the rubble in this area was excavated and disposed off-Site at a permitted landfill by the PRP Group in August 2011. Samples collected during the excavation did not identify any source material.

Contaminants exceeding the federal MCLs and NYSDEC Water Quality Regulations for Groundwater (NYCRR, Title 6, Part 703) in the monitoring wells and piezometer located in the MW-19 Area have been PCE, 1,1,1-TCA, and 1,1-DCA. Since 2003 source removal, MW-19 Area plume detected PCE from 30 to 69 ug/L, 1,1,1-TCA from 41 to 99 ug/l, and 1,1-DCA from 5.7 to 21 ug/l. cis-1,2-DCE and VC are also breakdown products of PCE, however, they have not been detected in the groundwater of the MW-19 Area plume in exceedance of the standards. The NYS AWQS and the federal MCLs for PCE, 1,1,1-TCA, 1,1-DCA, and cis-1,2-DCE are 5 ug/l and for VC is 2 ug/l. The MW-19 Area plume is estimated to be about 120 ft by 80 ft and 30 ft in depth.

EPA has determined that the restoration of the groundwater in the MW-19 Area is technically impracticable from an engineering perspective due to the ineffectiveness of active remedies in the low permeable soils found at the Site, the limited mobility of the groundwater contamination (the contaminant plume is not migrating), and the inability to locate a source. Therefore, EPA is proposing a technical impracticability waiver pursuant to CERCLA §121(d)(4)(C) and NCP §300.430(f)(1)(ii)(C)(3) for the groundwater in this area.

Because the existing deed restriction prohibits the installation and use of the groundwater wells at the Site for drinking water purposes, the potential for direct contact or inhalation threat associated with contaminated groundwater does not exist. Also, there are no current and potential receptors downgradient of MW-19 Area. If, in the future, structures are proposed to be built on the property, then a soil vapor intrusion evaluation and,

potentially, vapor mitigation may be needed, or alternatively just soil vapor mitigation. As a governmental institutional control, the Office of the Town of Fenton Building Inspector has acknowledged to EPA that such office will notify any person seeking to build residential structures at the Site of soil vapor concerns relating to the property, and specifically of the need for a soil vapor evaluation and potentially, soil vapor mitigation systems or, alternatively just soil vapor mitigation.

While it has been estimated that site-wide groundwater restoration would be achieved in 50 years, the restoration time frame for the MW-19 Area is unknown, since a source of the contamination has not been identified. It is anticipated that the restoration time frame would be significantly greater than 50 years.

The "technical impracticability zone" is the approximate 120 ft by 80 ft MW-19 Area to a depth of 30 ft (see Figures 2 and 3). The ARARs that would be waived for this zone would be the federal MCLs and NYSDEC Water Quality Regulations for Groundwater (NYCRR, Title 6, Part 703) for PCE, 1,1,1-TCA, 1,1-DCA, cis-1,2-DCE, and VC. Both ARARs cited above are applicable requirements which are being waived. The MW-19 Area groundwater will continue to be monitored periodically to confirm that the technically impracticable zone is not expanding in size and no additional contaminants other than those waived are detected above MCLs.

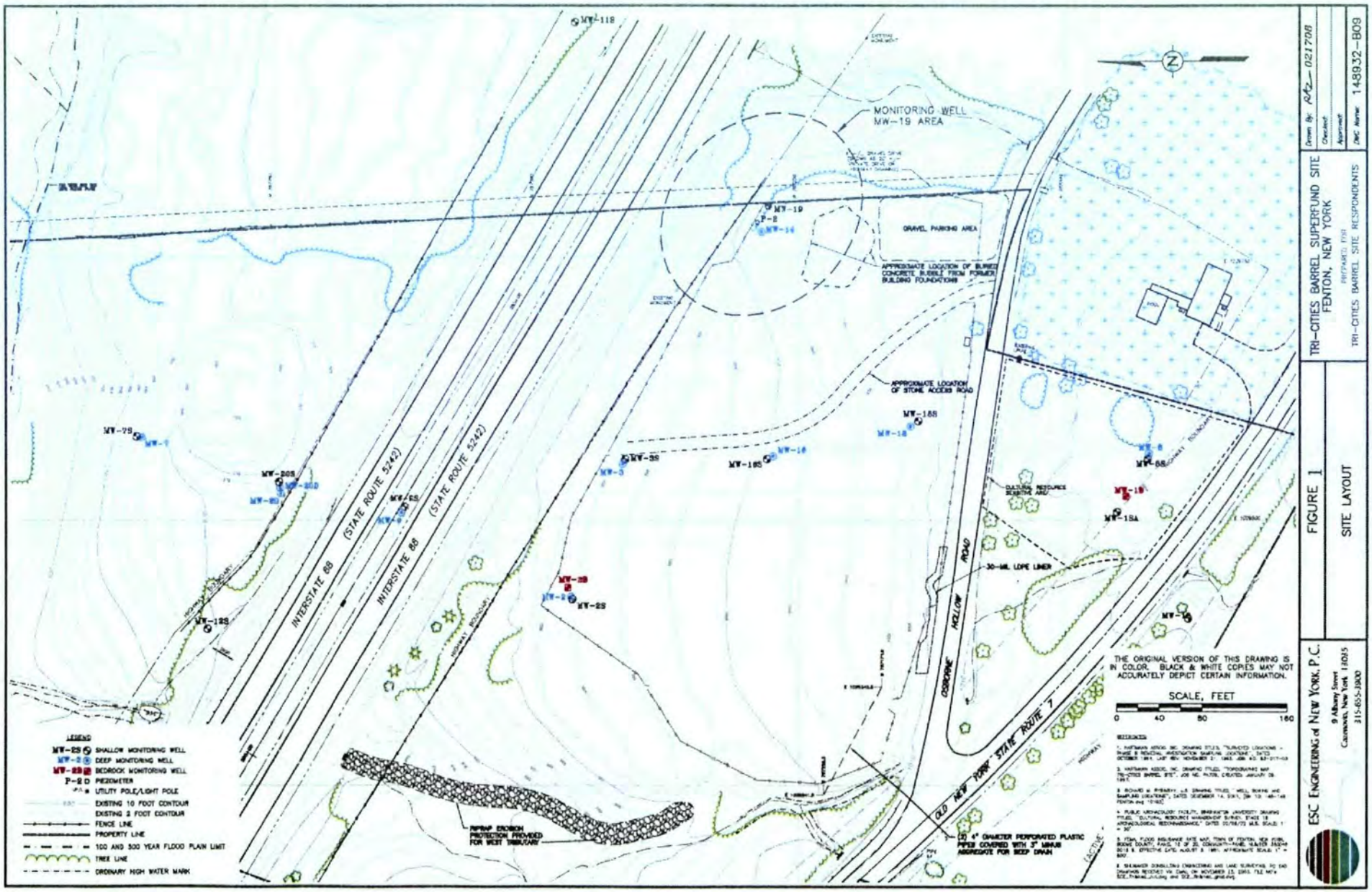
DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan released for public comment on July 31, 2011, identified Alternative GW-2, MNA, as the preferred modified groundwater remedy. It also identified the EPA plans to invoke a technical impracticability waiver for the MW-19 Area groundwater. Based upon its review of the written and oral comments submitted during the public comment period, EPA has determined that no significant changes to the remedy, as originally identified in the Proposed Plan for Remedy Modification, are necessary or appropriate.

APPENDIX I

FIGURES

Figure 1 Site Layout
Figure 2 MW-19 Area (Horizontal)
Figure 3 MW-19 Area (Vertical)



Drawn By: RAL 021708
Checked:
Approved:
DMC Number: 148932-809

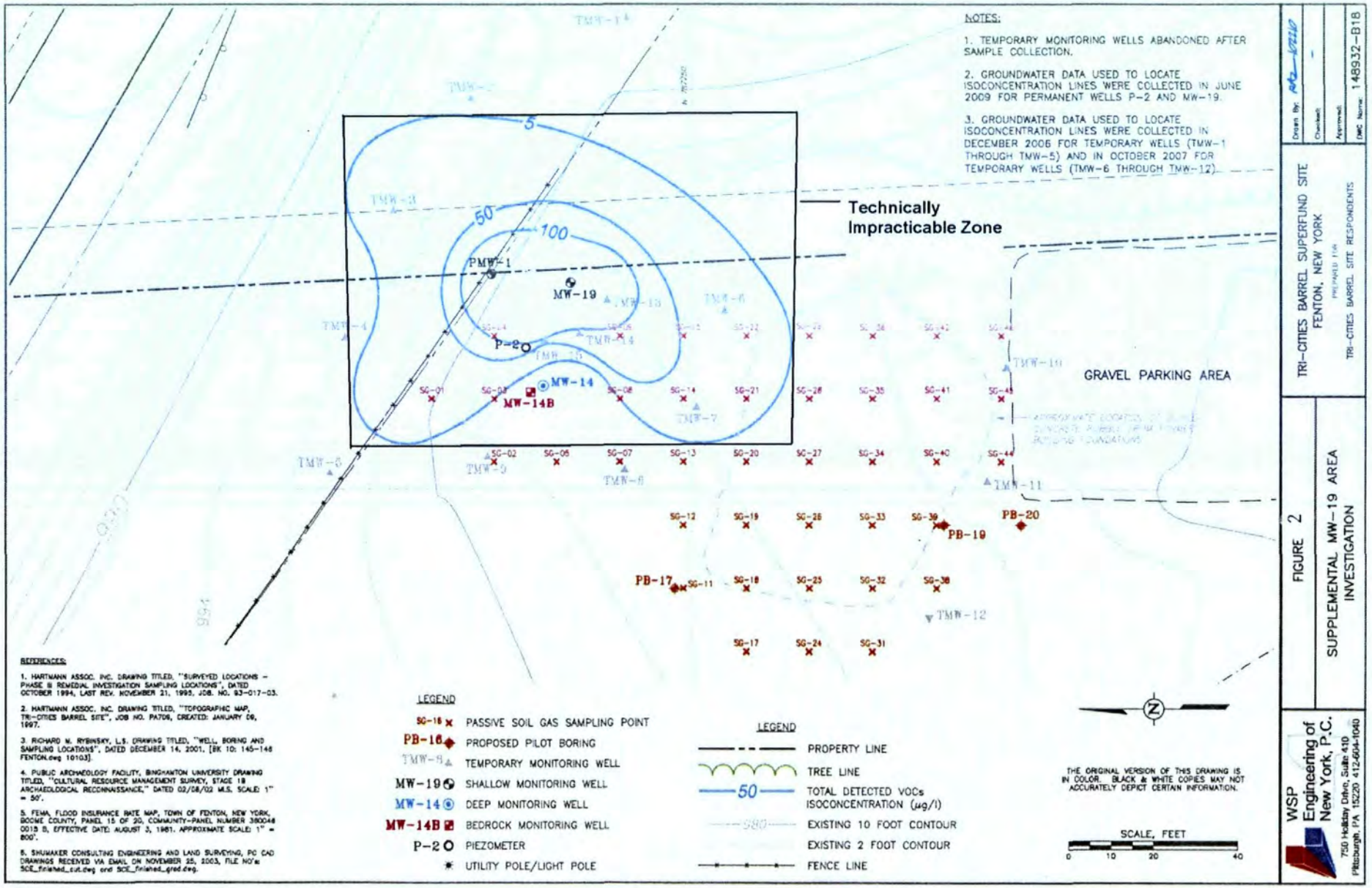
TRI-CITIES BARREL SUPERFUND SITE
FENTON, NEW YORK
PREPARED FOR
TRI-CITIES BARREL SITE RESPONDENTS

FIGURE 1
SITE LAYOUT

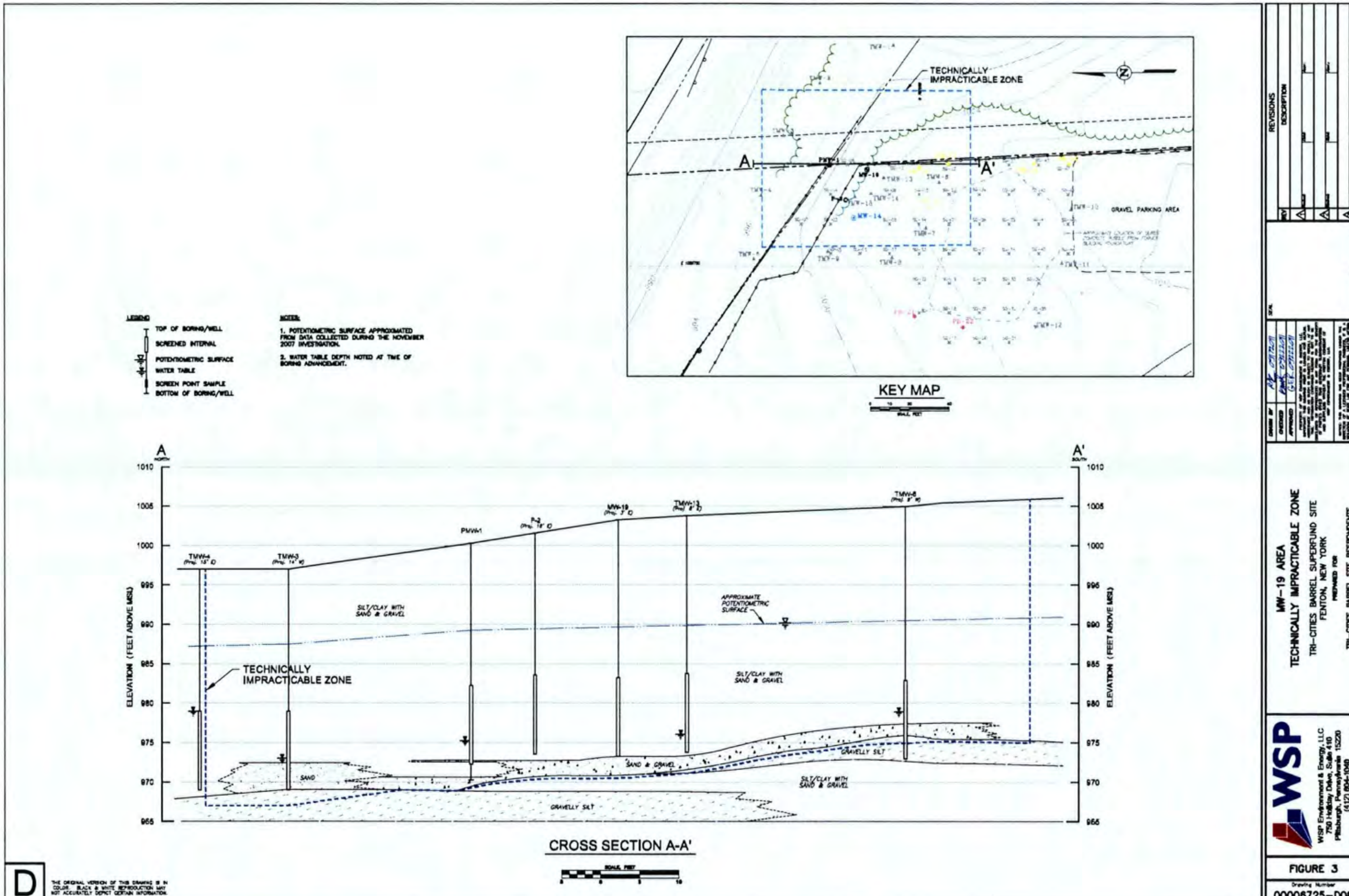
ESC ENGINEERING of NEW YORK, P.C.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

R:\AutoCAD DWGs\140\148932 TriCities\148932809.dwg, 2/17/2008 2:11:34 PM, usr01165

531221


NOTES:
1. TEMPORARY MONITORING WELLS ABANDONED AFTER SAMPLE COLLECTION.
2. GROUNDWATER DATA USED TO LOCATE ISOCONCENTRATION LINES WERE COLLECTED IN JUNE 2009 FOR PERMANENT WELLS P-2 AND MW-19.
3. GROUNDWATER DATA USED TO LOCATE ISOCONCENTRATION LINES WERE COLLECTED IN DECEMBER 2006 FOR TEMPORARY WELLS (TMW-1 THROUGH TMW-5) AND IN OCTOBER 2007 FOR TEMPORARY WELLS (TMW-6 THROUGH TMW-12).
Technically Impracticable Zone
GRAVEL PARKING AREA
REFERENCES:
1. HARTMANN ASSOC. INC. DRAWING TITLED, "SURVEYED LOCATIONS - PHASE III REMEDIAL INVESTIGATION SAMPLING LOCATIONS", DATED OCTOBER 1994, LAST REV. NOVEMBER 21, 1995. JOB. NO. 93-017-03.
2. HARTMANN ASSOC. INC. DRAWING TITLED, "TOPOGRAPHIC MAP, TRI-CITIES BARREL SITE", JOB NO. PA706, CREATED: JANUARY 09, 1997.
3. RICHARD M. RYBINSKY, L.S. DRAWING TITLED, "WELL, BORING AND SAMPLING LOCATIONS", DATED DECEMBER 14, 2001. [BK 10: 145-146 FENTON.dwg 10103].
4. PUBLIC ARCHAEOLOGY FACILITY, BINGHAMTON UNIVERSITY DRAWING TITLED, "CULTURAL RESOURCE MANAGEMENT SURVEY, STAGE 1B ARCHAEOLOGICAL RECONNAISSANCE," DATED 02/08/02 M.S. SCALE: 1" = 50'.
5. FEMA, FLOOD INSURANCE RATE MAP, TOWN OF FENTON, NEW YORK, BROOME COUNTY, PANEL 15 OF 20, COMMUNITY-PANEL NUMBER 360048 0015 B, EFFECTIVE DATE: AUGUST 3, 1981. APPROXIMATE SCALE: 1" = 800'.
6. SHUMAKER CONSULTING ENGINEERING AND LAND SURVEYING, PC CAD DRAWINGS RECEIVED VIA EMAIL ON NOVEMBER 25, 2003, FILE NO's: SCE_finished_cut.dwg and SCE_finished_grad.dwg.
LEGEND
SG-16 PASSIVE SOIL GAS SAMPLING POINT
PB-16 PROPOSED PILOT BORING
TMW-9 TEMPORARY MONITORING WELL
MW-19 SHALLOW MONITORING WELL
MW-14 DEEP MONITORING WELL
MW-14B BEDROCK MONITORING WELL
P-2 PIEZOMETER
UTILITY POLE/LIGHT POLE
LEGEND
PROPERTY LINE
TREE LINE
50 TOTAL DETECTED VOCs ISOCONCENTRATION (µg/l)
980 EXISTING 10 FOOT CONTOUR
EXISTING 2 FOOT CONTOUR
FENCE LINE
THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE COPIES MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.
SCALE, FEET
0 10 20 40
Drawn By: AEZ
Checked:
Approved:
DWG Name: 148932-B18
TRI-CITIES BARREL SUPERFUND SITE
FENTON, NEW YORK
PREPARED FOR
TRI-CITIES BARREL SITE RESPONDENTS
FIGURE 2
SUPPLEMENTAL MW-19 AREA INVESTIGATION
WSP Engineering of New York, P.C.
750 Holiday Drive, Suite 410
Pittsburgh, PA 15220 412-604-1040
R:\Auto\CAD DWGs\1401\148932 TriCities\148932918.dwg, 10/22/2010 3:30:08 PM, USHZ01165

R:\Acad\CADD\00006\00006725-Tri-Cities\CAD\00006725-D06.dwg, 9/22/2011 9:05:27 AM, usrz01165



531223

APPENDIX II

TABLES

Table 1 Summary of Groundwater Data Since 2003

Contaminants	Number of Detections above ARAR	Number Analyzed	Min. Conc. ug/l	Max. Conc. ug/l	ARAR Conc. ug/l
VOCs					
2-Butanone (MEK)	0	151	10 U	10 U	50
1,1-Dichloroethane	41	151	1 U	1,100	5
1,2-Dichloroethane	11	151	0.6 U	39 J	0.6
1,1,1-Trichloroethane	19	42	1 U	99	5
cis-1,2-Dichloroethene	45	151	1 U	9,000	5
Methylene chloride	4	151	5 U	59J	5
Tetrachloroethene	23	151	1 U	69	5
Toluene	5	151	1 U	190	1
Trichloroethene	27	151	1 U	720	5
Vinyl chloride	52	151	1 U	280	2
SVOCs					
bis(2-Ethylhexyl)phthalate	1	36	5 U	5.4	5
Metals					
Cadmium	2	36	5 U	7.9	5
Iron	13	36	37J	6,900J	300
Manganese	32	36	56	1,600	300

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

U - constituent not detected at the noted detection limit
J - constituent detected at an estimated concentration

Table 2 Groundwater Data in 2010

	Well ID								
	MW-2S		MW-2		MW-3S		MW-7S		MW-14
Sample Date	6/15	12/21	6/15	12/21	6/16	12/21	6/15	12/21	6/15
Parameters (ug/l)									
VOCs									
2-Butanone (MEK)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	3.4	12	1.7	4.1	200	160	1 U	1 U	1.7
1,2-Dichloroethane	0.6 U	0.6 U	0.6 U	0.6 U	3.7	2.5	0.6 U	0.6 U	0.61
1,1,1-Trichloroethane	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	1.9	5.8	0.21 J	5.4	270	130	1 U	1 U	0.85 J
Methylene chloride	5 U	5 U	5 U	5 U	3.8 J	4 J	5 U	5 U	1 U
Tetrachloroethene	1 U	1 U	1 U	1 U	1.5	1.1	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	0.22 J	0.21 J	0.72 J	31	1.9	1.1	1 U	1 U	1 U
Vinyl chloride	0.21 J	1.2	1 U	6.4	68	6.9	1 U	1 U	2 U

	Well ID								
	MW-16S		MW-19		MW-20S		MW-20	P-2	
Sample Date	6/15	12/21	6/16	12/22	6/15	12/21	6/15	6/16	12/21
Parameters (ug/l)									
VOCs									
2-Butanone (MEK)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10	8.8 J	4.4	3.9	1 U	1 U	1 U	5.9	4.9
1,2-Dichloroethane	0.21 J	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
1,1,1-Trichloroethane	-	-	99	67	-	-	-	72	64
cis-1,2-Dichloroethene	630	610	1 U	0.29 J	1 U	1 U	1 U	0.89 J	1.2
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	1 U	1 U	66	69	1 U	1 U	1 U	46	64
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	720	680	1.7	1.8	1 U	1 U	1 U	2.1	1.9
Vinyl chloride	270	170	1 U	1 U	1.4	2	1 U	2 U	1 U

Notes:
Highlighted data exceeds ARARs.
U - constituent not detected at the noted detection limit
J - constituent detected at an estimated concentration

Table 3. Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations.

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	EPC Units	Statistical Unit
		Min	Max					
Tap and Showerhead	1,1 Dichloroethane	1 (U)	160	ug/l	2/5	160	ug/l	Max < 10 samples
	1,2 Dichloroethane	0.6 (U)	2	ug/l	1/5	2	ug/l	Max < 10 samples
	cis 1,2-Dichloroethene	1 (U)	440	ug/l	3/5	440	ug/l	Max < 10 samples
	1,2 Dichloroethylene (total)	2 (U)	470	ug/l	3/5	470	ug/l	Max < 10 samples
	Methylene chloride	1 (U)	2.6	ug/l	1/5	2.6	ug/l	Max < 10 samples
	Tetrachloroethylene	1 (U)	1.3	ug/l	1/5	1.3	ug/l	Max < 10 samples
	Trichloroethylene	1 (U)	1.3	ug/l	3/5	460	ug/l	Max < 10 samples
	Vinyl chloride	2 (U)	83	ug/l	4/5	460	ug/l	Max < 10 samples

notes:

(U) = non-detect

ug/l = micrograms/liter

TABLE 4

SELECTION OF EXPOSURE PATHWAYS

Tri-Cities Barrel, Fenton, New York

Scenario Timeframe	Medium and Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Tapwater	Resident	Adult	Ingestion	Quant.	Private wells are currently used in the area for potable purposes. There is a potential for future exposure to groundwater through ingestion of contaminated groundwater and inhalation of volatile organic compounds while showering if the groundwater under the site was used for potable purposes by a current/future resident.
				Child	Ingestion	Quant.	Private wells are currently used in the area. There is a potential for future exposure to groundwater through ingestion of contaminated groundwater and inhalation of volatile organic compounds while showering if the groundwater under the site was used for potable purposes by a current/future resident.
		Shower head	Resident	Adult	Inhalation	Quant.	Private wells are currently used in the area. There is a potential for future exposure to groundwater through ingestion of contaminated groundwater and inhalation of volatile organic compounds while showering if the groundwater under the site was used for potable purposes by a current/future esident.
				Child	Inhalation	Quant.	Private wells are currently used in the area. There is a potential for future exposure to groundwater through ingestion of contaminated groundwater and inhalation of volatile organic compounds while showering if the groundwater under the site was used for potable purposes by a current/future resident.
Future	Groundwater	Tapwater	On-site worker	Adult	Ingestoin	Quant.	Private wells are currently used in the area for potable purposes. There is a potential for future exposure to groundwater through ingestion of contaminated groundwater and inhalation of volatile organic compounds while showering if the groundwater under the site was used for potable purposes by the current/future worker.
		Shower head	On-site worker	Adult	Inhalation	Quant.	Private wells are currently used in the area. There is a potential for future exposure to groundwater through ingestion of contaminated groundwater and inhalation of volatile organic compounds while showering if the groundwater under the site was used for potable purposes by the current/future worker.

Table 5. Cancer Toxicity Data Summary

Pathway: **Ingestion, Dermal**						
Chemical of Concern	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Slope Factor Units	Weight of Evidence Classification	Source	Date
1,1 Dichloroethane	0.0057	0.0057	mg/kg-day	C	CalEPA	9/1/08
1,2 Dichloroethane	0.091	0.091	mg/kg-day	B2	IRIS	9/1/08
cis 1,2-Dichloroethene	NA	NA		D	IRIS	9/1/08
1,2 Dichloroethylene (total)	NA	NA		D	IRIS	9/1/08
Methylene chloride	0.0075	0.0075	mg/kg-day	B2	IRIS	9/1/08
Tetrachloroethylene	0.54	0.54	mg/kg-day	C-B2	CalEPA	9/1/08
Trichloroethylene	0.013	0.013	mg/kg-day	C-B2	CalEPA	9/1/08
Vinyl chloride	0.72	0.72	mg/kg-day	A	IRIS	9/1/08

notes:

A - known carcinogen

B2 - probable human carcinogen

C - possible human carcinogen

D - not classifiable

E - non-human carcinogen.

CAL EPA - California Environmental Protection Agency

IRIS - Integrated Risk Information System (www.epa.gov/iris)

NA – Not available

Table 5. Cancer Toxicity Data Summary (continued)

Pathway: **Inhalation**					
Chemical of Concern	Inhalation Unit Risk	Units	Weight of Evidence Classification	Source	Date
1,1 Dichloroethane	1.6 E-06	$(ug/m^3)^{-1}$	C	CalEPA	9/1/08
1,2 Dichloroethane	2.6 E-05	$(ug/m^3)^{-1}$	B2	IRIS	9/1/08
cis 1,2-Dichloroethene	NA		D	IRIS	9/1/08
1,2 Dichloroethylene (total)	NA		D	IRIS	9/1/08
Methylene chloride	4.7 E-07	$(ug/m^3)^{-1}$	B2	IRIS	9/1/08
Tetrachloroethylene	5.9 E-06	$(ug/m^3)^{-1}$	C-B2	CalEPA	9/1/08
Trichloroethylene	2.0 E-06	$(ug/m^3)^{-1}$	C-B2	CalEPA	9/1/08
Vinyl chloride	4.4 E-06	$(ug/m^3)^{-1}$	A	IRIS	9/1/08

notes:

A - known carcinogen

B2 - probable human carcinogen

C - possible human carcinogen

D - not classifiable

E - non-human carcinogen

CalEPA - California Environmental Protection Agency

IRIS - Integrated Risk Information System (www.epa.gov/iris)

NA – Not applicable

ug/m^3 = micrograms/cubic meter

Table 6. Non-Cancer Toxicity Data Summary.

Pathway: **Ingestion, Dermal**									
COC	Chronic/ Subchronic	Oral RfD Value	Units	Dermal RfD	Units	Primary Target Organ	Combined UF/ MF	Source of RfD Target Organ	Dates
1,1 Dichloroethane	Chronic	0.20	mg/kg-day	0.20	mg/kg-day	NOAEL	3000	PPRTV	9/1/08
1,2 Dichloroethane	Chronic	N/A	mg/kg-day	N/A	mg/kg-day	N/A	N/A	IRIS	9/1/08
cis 1,2-Dichloroethene	Chronic	0.01	mg/kg-day	0.01	mg/kg-day	NOAEL	3000	PPRTV	9/1/08
1,2 Dichloroethylene (mixed isomers)	Chronic	0.009	mg/kg-day	0.009	mg/kg-day	LOAEL	1000	HEAST	9/1/08
Methylene chloride	Chronic	0.06	mg/kg-day	0.06	mg/kg-day	Liver	100	IRIS	9/1/08
Tetrachloroethylene	Chronic	0.01	mg/kg-day	0.01	mg/kg-day	Liver	1000	IRIS	9/1/08
Trichloroethylene	Chronic	N/A	mg/kg-day	N/A	mg/kg-day	NA	NA	IRIS	9/1/08
Vinyl chloride	Chronic	0.003	mg/kg-day	0.003	mg/kg-day	Liver	30	IRIS	9/1/08

notes:

Absorption rates were derived from the U.S. EPA Dermal Guidance (USEPA, 2004)

RfD – Reference Dose

NOAEL - No Observed Adverse Effect Level

LOAEL - Lowest Observed Adverse Effect Level

PPRTV - Provisional Peer Reviewed Toxicity Value

IRIS - Integrated Risk Information System obtained from www.epa.gov/iris on 9/1/08

HEAST - Health Effects Assessment Tables

NA – Not available

Table 6. Non-Cancer Toxicity Data Summary. (continued)

Pathway: **Inhalation**									
COC	Chronic/ Subchronic	Inhalation RfC Value	Units	Inhalation RfD	Units	Primary Target Organ	Combined UF/ MF	Source of RfD Target Organ	Dates
1,1 Dichloroethane	Chronic	0.50	mg/m^3	N/A	mg/kg-day	Kidney	1000	HEAST	9/1/08
1,2 Dichloroethane	Chronic	2.40	mg/m^3	N/A	mg/kg-day	NOAEL	90	ATSDR	9/1/08
cis 1,2-Dichloroethene	Chronic	N/A	mg/m^3	N/A	mg/kg-day	N/A		IRIS	9/1/08
1,2 Dichloroethylene (mixed isomers)	Chronic	N/A	mg/m^3	N/A	mg/kg-day	N/A		HEAST	9/1/08
Methylene chloride	Chronic	1.10	mg/m^3	N/A	mg/kg-day	NOAEL	30	ATSDR	9/1/08
Tetrachloroethylene	Chronic	0.27	mg/m^3	N/A	mg/kg-day	LOAEL	100	ATSDR	9/1/08
Trichloroethylene	Chronic	0.6	mg/m^3	N/A	mg/kg-day	Nervous System/Eye	NA	CalEPA	9/1/08
Vinyl chloride	Chronic	0.1	mg/m^3	N/A	mg/kg-day	Liver	30	IRIS	9/1/08

notes:

RfC – Reference Concentration

RfD – Reference Dose

NOAEL - No Observed Adverse Effect Level

LOAEL - Lowest Observed Adverse Effect Level

ATSDR - Agency for Toxic Substances and Disease Registry

CalEPA - California Environmental Protection Agency

HEAST - Health Effects Assessment Tables

NA – Not available

Table 7. Risk Characterization - Summary of Carcinogens

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

Media	Exposure Media	Exposure point	COC	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Rad)	Exposure Routes Total
Groundwater	Groundwater	Tap Water / Shower	1,1 Dichloroethane	8.6E-06	1.3E-06	NA	NA	9.9E-06
			1,2 Dichloroethane	1.7E-06	2.6E-07	NA	NA	1.96E-06
			Methylene chloride	2.3E-08	4.9E-09	NA	NA	2.8E-08
			Tetrachloroethylene	6.6 E-06	3.0E-08	NA	NA	6.6E-06
			Trichloroethylene	5.6E-05	3.7E-06	NA	NA	6.0E-05
			Vinyl chloride	5.5E-04	1.5E-06	NA	NA	5.5E-04
			Pathway Total	6.1E-04	6.7E-06	NA	NA	6.2E-04
							Total Risk	6.2E-04

NA: Route of exposure is not applicable to this medium

Table 7. Risk Characterization - Summary of Carcinogens (continued)

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

Media	Exposure Media	Exposure point	COC	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Rad)	Exposure Routes Total
Groundwater	Groundwater	Tap Water / Shower	1,1 Dichloroethane	5.0E-06	4.0E-09	NA	NA	5.0E-06
			1,2 Dichloroethane	1.0E-07	5.2E-08	NA	NA	1.0E-06
			Methylene chloride	1.1E-07	1.2E-09	NA	NA	1.1E-07
			Tetrachloroethylene	3.8E-06	7.6E-09	NA	NA	3.8E-06
			Trichloroethylene	3.3E-05	9.1E-07	NA	NA	3.3E-05
			Vinyl chloride	3.2E-04	3.6E-07	NA	NA	3.2E-04
			Pathway Total	3.6E-04	1.3E-06	NA	NA	3.6E-04
							Total Risk	3.6E-04

NA: Route of exposure is not applicable to this medium

Table 7 Risk Characterization - Summary of Carcinogens (continued)

Scenario Timeframe: Future
Receptor Timeframe: Future
Receptor Age: **On-Site Worker**

Media	Exposure Media	Exposure point	COC	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Rad)	Exposure Routes Total
Groundwater	Groundwater	Tap Water / Shower	1,1 Dichloroethane	6.4E-06	1.7E-08	NA	NA	6.4E-06
			1,2 Dichloroethane	1.3E-06	2.2E-07	NA	NA	1.52E-06
			Methylene chloride	1.4E-07	5.1E-09	NA	NA	1.4E-07
			Tetrachloroethylene	4.9E-06	3.2E-08	NA	NA	4.9E-06
			Trichloroethylene	4.2E-05	3.8E-06	NA	NA	4.5E-05
			Vinyl chloride	4.2E-04	1.5E-06	NA	NA	4.2E-04
			Pathway Total	4.7E-04	5.6E-06	NA	NA	4.7E-04
							Total Risk	4.7E-04

NA: Route of exposure is not applicable to this medium

Table 8. Risk Characterization - Summary of Non-Carcinogens

Scenario Timeframe: Future
Receptor Timeframe: Future
Receptor Age: **Adult**

Media	Exposure Media	Exposure point	COC	Target Organ	Non-Cancer Health Hazard				
					Ingestion	Inhalation	Dermal	External (Rad)	Exposure Routes Total
Groundwater	Groundwater	Tap Water / Shower	cis 1,2- dichloroethene	NOAEL	1.2	NA	NA	NA	1.2
			Vinyl chloride	Liver	0.76	0.003	NA	NA	0.76
				Pathway Total	2.0	0.003	NA	NA	2.0
								Total Risk	2.0

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

Media	Exposure Media	Exposure point	COC	Target Organ	Non-Cancer Health Hazard				
					Ingestion	Inhalation	Dermal	External (Rad)	Exposure Routes Total
Groundwater	Groundwater	Tap Water / Shower	cis 1,2- dichloroethene	NOAEL	2.8	NA	NA	NA	2.8
			Vinyl chloride	Liver	1.8	0.00082	NA	NA	1.8
				Pathway Total	4.6	0.00082	NA	NA	4.6

NA: Route of exposure is not applicable to this medium

Table 8. Risk Characterization - Summary of Non-Carcinogens (continued)

Scenario Timeframe: Future
Receptor Timeframe: Future
Receptor Age: **Adult On-Site Worker**

Media	Exposure Media	Exposure point	COC	Target Organ	Non-Cancer Health Hazard				
					Ingestion	Inhalation	Dermal	External (Rad)	Exposure Routes Total
Groundwater	Groundwater	Tap Water / Shower	cis 1,2- dichloroethene	NOAEL	0.86	NA	NA	NA	0.86
			Vinyl chloride	Liver	0.54	0.0025	NA	NA	0.54
				Pathway Total	1.4	0.0025	NA	NA	1.4
								Total Risk	1.4

NA: Route of exposure is not applicable to this medium

Table 9 Updates to Toxicity Values and Calculated Risks

Since the completion of the 2008 Human Health Risk Assessment, the following toxicity values changed.

Chemical	Toxicity Value Type	2008 Value	2011 Value	Reason for Change and Source of Toxicity Value
Trichloroethylene	Oral Cancer Slope Factor	1.3 E-02 $(mg/kg\text{-}day)^{-1}$	5.9 E-03 $(mg/kg\text{-}day)^{-1}$	Updated CalEPA Value
cis-1,2-dichloroethene	Oral Reference Dose	1.0 E-02 mg/kg-day	2.0 E-03 mg/kg-day	Updated IRIS Value
Updated Calculated Risks				
Trichloroethylene	**Chemical Specific Future Cancer Risk**		**Total Future Cancer Risk**	
Receptor	**2008**	**2011**	**2008**	**2011**
Child Resident	3.3 E-05	1.5 E-05	3.6 E-04	3.4 E-04
Adult Resident	5.6 E-05	2.5 E-05	6.2 E-04	5.9 E-04
On-Site Worker	4.2 E-05	1.9 E-05	4.7 E-04	4.5 E-04
cis-1,2-dichloroethene	**Chemical Specific Future Non-Cancer Hazard**		**Total Future Non-Cancer Hazard**	
Receptor	**2008**	**2011**	**2008**	**2011**
Child Resident	2.8	14.0	4.6	16.0
Adult Resident	1.2	6.0	2.0	6.8
On-Site Worker	0.86	4.3	1.4	4.9

Table 10 Federal and State MCLs for Drinking Water

Contaminants	Federal Safe Drinking Water Act	New York State Water Quality Standards for Class GA (Groundwater)	New York Public Water Supply Regulations
	MCL (ug/l)	NYCRR, Title 6 Part 701-703 (ug/l)	NYCRR, Title 10 Part 5-1 (ug/l)
VOCs			
2-Butanone (MEK)		50	50
1,1-Dichloroethane		5	5
1,2-Dichloroethane	5	0.6	5
1,1,1-Trichloroethane	200	5	5
cis-1,2-Dichloroethene	70	5	5
Methylene chloride	5	5	5
Tetrachloroethene	5	5	5
Toluene	1	5	
Trichloroethene	5	5	
Vinyl chloride	2	2	2
SVOCs			
bis(2-Ethylhexyl)phthalate	6	5	6
Metals			
Cadmium	5	5	5
Iron		300	300
Manganese		300	300

Table 11

Cost Estimate
MNA (Site-Wide Excluding MW-19 Area)
Tri-Cities Barrel Superfund Site
Fenton, New York (a)

Description:
Implement groundwater monitoring program
Capital costs occur in Year 0
Annual O&M costs occur in Years 1-30
Periodic costs occur every 5 years

		QTY	Unit	Unit Cost	Total	Notes
Capital						
Administrative Requirements						
Rod Modification Support		1	LS	$ 15,000	$ 15,000	arbitrary
GW Monitoring Plan		1	LS	$ 35,000	$ 35,000	
					$ 50,000	
	SUBTOTAL				$ 50,000	
	Contingency				$ 12,500	25%
	SUBTOTAL				$ 62,500	
	SUBTOTAL				$ 62,500	
	Project Management				$ 3,125	5%
	TOTAL CAPITAL COST				$ 65,625	
Monitoring						
Performance Monitoring						
Procurement/Setup		24	Hours	$ 120	$ 2,880	
Travel		2	Trip	$ 500	$ 1,000	
Annual sampling (two full time)		6	Days	$ 1,500	$ 9,000	10 wells
Groundwater lab		13	Each	$ 220	$ 2,860	metals, VOCs
MNA Parameters		10	Each	$ 500	$ 5,000	
Equipment Rental		1	Week	$ 5,000	$ 5,000	
Shipping		3	Each	$ 150	$ 450	
Report		1	Each	$ 7,500	$ 7,500	
				Event	$ 33,690	matches actual effort
				Annual	$ 134,760	
Five Year Review Reports						
Years 5,10,15, 20, 25, 30					$ 15,000	
Abandonment						
Well Abandonment		40	Each	$ 700	$ 28,000	
Site Restoration		1	acre	$ 3,500	$ 3,500	
					$ 31,500	

Present Value Analysis

Type	Year	Total Cost	Annual Cost	Discount Factor (7%)	Present Value
Capital	0	$ 65,625	65625	1	$ 65,625
Annual O&M	1-30	4042800	$ 134,760	12.409	$ 1,672,237
Periodic Cost	5	$ 15,000	15000	0.713	$ 10,695
Periodic Cost	10	$ 15,000	15000	0.508	$ 7,620
Periodic Cost	15	$ 15,000	15000	0.362	$ 5,430
Periodic Cost	20	$ 15,000	15000	0.258	$ 3,870
Periodic Cost	25	$ 15,000	15000	0.184	$ 2,760
Periodic Cost	30	$ 15,000	15000	0.131	$ 1,965
Abandon System	30	$ 31,500	$ 31,500	0.131	$ 4,127
		$ 4,229,925			$ 1,774,328
		Total Present Value			**$ 1,774,328**

APPENDIX III

ADMINISTRATIVE RECORD INDEX

111397

TRI-CITIES BARREL CO., INC.
OPERABLE UNIT ONE
ADMINISTRATIVE RECORD FILE UPDATE #6
INDEX OF DOCUMENTS

5.0 RECORD OF DECISION

5.2 Amendment to the Record of Decision

P. 500173 - 500419
Doc. ID# 111379
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 500420 - 500701
Doc. ID# 111380
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix C - Groundwater Monitoring Logs, (Provided on CD), prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 500702 - 503791
Doc. ID# 111381
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D, Part 1, December 2001, prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 503792 - 506936
Doc. ID# 111382
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D, Part 2, Summer 2002, prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 506937 - 513402
Doc. ID# 111383
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D, Part 3, Spring 2003, prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 513403 - 514024
Doc. ID# 111384
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D, Part 4, Summer 2003, prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 514025 - 517345
Doc. ID# 111385
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D, Part 5, Spring 2004, prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 517346 - 520237
Doc. ID# 111386
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D, Part 6, Summer 2004, prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 520238 - 522656
Doc. ID# 111387
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D, Part 7, Fall 2004, prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 522657 - 525318
Doc. ID# 111388
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D, Part 8, January 2005, prepared by ESC Engineering of New York, P.C., prepared for

U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 525319 - 525720
Doc. ID# 111389
Report: Final Revised Comprehensive Monitored Natural Attenuation Evaluation, Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D, Part 9 Spring 2005, prepared by ESC Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, August 16, 2007.

P. 525721 - 525768
Doc. ID# 111390
Report: Pilot Study Report (Revision 2) Tri-Cities Barrel Superfund Site, Fenton, New York, prepared by WSP Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, January 15, 2010.

P. 525769 - 527591
Doc. ID# 111391
Report: Pilot Study Report (Revision 2) Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix D - Laboratory Data - Provided on CD, prepared by WSP Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, January 15, 2010.

P. 527592 - 528408
Doc. ID# 111392
Report: MW-19 Area Supplemental Investigation Report, Tri-Cities Barrel Superfund Site, Fenton, New York, prepared by WSP Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, February 3, 2011.

P. 528409 - 528526
Doc. ID# 111394
Report: Final Focused Feasibility Study, (Revision 2), Tri-Cities Barrel Superfund Site, Fenton, New York, prepared by WSP Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, July 21, 2011.

P. 528527 - 531007
Doc. ID# 111395
Report: Final Focused Feasibility Study, (Revision 2), Tri-Cities Barrel Superfund Site, Fenton, New York, Appendix A - MW-19, Area Reports, prepared by WSP Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, July 21, 2011.

P. 531008 - 531169
Doc. ID# 111396
Report: Final Focused Feasibility Study, (Revision 2), Tri-Cities Barrel Superfund Site,

Fenton, New York, Appendices B-E, prepared by WSP Engineering of New York, P.C., prepared for U.S. Environmental Protection Agency, Region 2, July 21, 2011.

P. 531170 - 531182
Doc. ID# 111393

Report: Superfund Proposed Plan for Remedy Modification, Tri-Cities Barrel Site, Town of Fenton, Broome County, New York, prepared by U.S. Environmental Protection Agency, Region 2, July 2011.

APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation
Office of the Director, 12th Floor
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **Fax:** (518) 402-9020
Website: www.dec.ny.gov

Joe Martens
Commissioner

September 13, 2011

SENT VIA EMAIL ONLY

Mr. Walter E. Mugdan, Director (mugdan.walter@epa.gov)
Emergency and Remedial Response Division
United States Environmental Protection Agency
Region II
290 Broadway, Floor 19
New York, New York 10007-1866

Re: Tri-City Barrel Company, Site No.: 704005
Amendment to the Record of Decision
New York State Concurrence

Dear Mr. Mugdan:

The New York State Department of Environmental Conservation (Department) and Department of Health (NYSDOH) have reviewed the draft Amendment to the Record of Decision dated September 2011 and concur with the amendment. We understand the amended remedy for this site includes a modification from a pump and treat alternative to monitored natural attenuation. As part of a long-term groundwater monitoring program, groundwater samples will be collected and analyzed periodically to verify that the level and extent of groundwater contaminants (*e.g.,* VOCs) are declining and that conditions are protective of human health and the environment. If this review indicates that monitored natural attenuation was not effective, more aggressive remedies, such as enhanced monitored natural attenuation, may be implemented.

In addition, as part of the amended remedy, EPA has determined that the restoration of the groundwater in the MW-19 Area (*i.e.,* attainment of the MCLs) is technically impracticable from an engineering perspective due to the ineffectiveness of active remedies in the low permeable soils found at the Site, the limited mobility of the groundwater contamination (the contaminant plume is not migrating), the absence of current and potential receptors, and the inability to locate a source. Therefore, EPA is issuing a technical impracticability waiver for the groundwater in this area. It is our understanding that the rubble near MW-19 has been excavated and disposed off site at a permitted landfill by the PRP Group as of August 2011.

The amended remedy was presented to the public at an August 16, 2011 meeting and a public comment period was provided. Comments from the meeting and comment period are presented and answered in the responsiveness summary included in the amendment. With this understanding, we concur with the selected remedy for the Tri-City Barrel Site.

If you have any questions or need additional information, please contact Mr. Edward Hampston at (518)402-9814.

Sincerely,

Dale A. Desnoyers

Dale A. Desnoyers, Director
Division of Environmental Remediation

ec: J. Singerman, USEPA (singerman.joel@epa.gov)
Y. Chang, USEPA (chang.young@epa.gov)
S. Bates, NYSDOH (smb02@health.state.ny.us)
G. Laccetti, NYSDOH (gjl02@health.state.ny.us)
R. Schick
M. Cruden
J. White
E. Hampston

APPENDIX V

RESPONSIVENESS SUMMARY

Appendices

V-a. Emails Submitted During the Public Comment Period

V-b. Public Notice

RESPONSIVENESS SUMMARY
Tri-Cities Barrel Superfund Site

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Tri-Cities Barrel Superfund site (Site) Proposed Plan for Remedy Modification (Proposed Plan) and the U.S. Environmental Protection Agency's (EPA's) and the New York State Department of Environmental Conservation's (NYSDEC's) responses to those comments and concerns. All comments summarized in this document have been considered in EPA and NYSDEC's final decision in the selection of a modified groundwater remedy at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The *Revised Comprehensive Monitored Natural Attenuation Evaluation Report* (ESC Engineering, 2007), *Pilot Study Report (Revision 2)* (WSP Engineering, 2010), *MW-19 Area Supplemental Investigation Report* (WSP Engineering, 2011), *Focused Feasibility Study Report (Revision 2)* (WSP Engineering, 2011), and *2011 Proposed Plan for Remedy Modification* for the Site were made available to the public in both the Administrative Record and information repositories[1] maintained at the EPA Docket Room in the Region II New York City office at 290 Broadway in Manhattan and the information repository at the Fenton Town Hall, 44 Park Street, Port Crane, New York. A notice of the commencement of the public comment period, the public meeting date, the preferred modified groundwater remedy, contact information, and the availability of the above-referenced documents was published in the *Binghamton Press and Sun Bulletin* on Sunday, July 31, 2011. A public comment period ran from July 31, 2011 to August 30, 2011.

EPA held a public meeting on August 16, 2011 at 7:00 P.M. at the Town of Fenton Town Hall to present the findings of the recent groundwater investigations and a focused feasibility study (FFS) and to answer questions from the public about the Site and the groundwater remedial alternatives under consideration. Approximately 20 people, including area residents, and state and local government officials, attended the public meeting. On the basis of comments received during the public comment period, the public generally supports the selected modified groundwater remedy.

---

[1] On August 1, 2011, another repository was added for this Site -- Fenton Free Library, 1062 Chenango Street, Binghamton, NY.

SUMMARY OF COMMENTS AND RESPONSES

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

- Email to Young Chang, dated August 3, 2011, from Keevin Kenyon, area resident.

- Email to Judith Enck, Regional Administrator, dated August 16, 2011 from James Little, Western Broome Environmental Stakeholders Coalition.

A summary of the comments contained in the above emails and the comments provided at the August 16, 2011 public meeting, as well as EPA and NYSDEC's responses to them, have been organized into the following topics:

- Extent of Contamination
- Remedial Alternatives
- MW-19 Area and Technical Impracticability Waiver Concerns
- Private Well Concerns
- Vapor Intrusion Concerns

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

Extent of Contamination

Comment #1: A commenter requested details related to the 2003 soil and sediment excavation activities conducted at the Site.

Response #1: Based upon the results of the 1999 RI/FS reports, a ROD was signed on March 31, 2000, which called for the excavation and off-site disposal of contaminated soil and sediment and the backfilling of the excavated area with clean fill. Pursuant to a consent decree, in 2003, the potentially responsible parties (PRPs) excavated and disposed of off-site 74,969 tons (40,000 cubic yards) of contaminated soil and sediment.

Comment #2: Several commenters expressed concern that contamination may have spread to soils north of Interstate-88 (I-88) up to, into, and along Osborne Creek, due to barrels traveling from the facility in flooding events during the mid-1970's and early 2000's.

Response #2: During the remedial investigation (RI), sampling in Osborne Creek did not detect any site-related contamination in surface water or sediment samples.

However, contamination was found in soils located north of I-88. During the 2003 remedial action, contaminated soil in various areas of north of I-88 was excavated to depths of two to six feet (ft) and disposed of off the Site.

Comment #3: Several commenters expressed concern about groundwater contamination potentially moving off the Site.

Response #3: The Site is underlain by 35 ft (southern portion of the Site, south of Old Route 7) to greater than 60 ft (northern portion of the Site) of unconsolidated deposits, which consist of a clayey till with discontinuous thin sand and gravel lenses. Beneath the unconsolidated deposits lies predominantly shale bedrock. Based on over fifteen years of data, it has been concluded by EPA that the contamination in the groundwater at this Site is confined to the shallow groundwater present in the till and discontinuous sand layers mentioned above.

The affected groundwater at the Site is mainly restricted to the area south of I-88, within the shallow, unconsolidated water-bearing zone; the bedrock aquifer is not contaminated. Prior to the 2003 removal of the contaminated soil, the groundwater plume at the Site appeared to be located in isolated zones within an area approximately 240 ft wide by 500 ft long. The vertical and horizontal extent of the groundwater contaminant plume has not expanded since the RI. Therefore, it is not anticipated that the groundwater will migrate off-site in the future.

Remedial Alternatives

Comment #4: A commenter requested that EPA clarify the processes that would result in the reduction in contaminant levels under the monitored natural attenuation alternative.

Response #4: Natural attenuation describes a variety of *in-situ* processes (*i.e.,* biodegradation, dispersion, sorption, volatilization, oxidation-reduction reactions), which under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. From 2001 through 2005, seven rounds of groundwater samples were collected as part of a natural attenuation study. The data indicate that the total mass of contaminants had greatly reduced after the removal of the contaminated soil, which was the source of the groundwater contamination. The data also showed the presence of reductive microbial metabolic products, which indicate that the primary mechanism responsible for the decline is biodegradation.

Under the monitored natural attenuation alternative, the groundwater contamination would be addressed through natural attenuation. Groundwater monitoring would be conducted to assess the progress of the natural attenuation. Specifically, groundwater samples would be collected and analyzed periodically in order to verify that the level and extent of groundwater contaminants are declining and that conditions are protective of human health and the environment. In addition, biodegradation parameters (*e.g.,* dissolved oxygen, nitrate, sulfate, methane, ethane, ethane, alkalinity, redox potential, pH, temperature, conductivity, chloride, sulfide, iron, and total organic carbon) would be used to assess the progress of the degradation process. Monitoring would continue until the state and federal drinking water standards are met.

Comment #5: A commenter asked if bioremediation, a technology that encourages the growth and reproduction of indigenous microorganisms to enhance biodegradation of organic constituents in the water table, would be an appropriate technique to remediate the contaminated groundwater.

Response #5: The 1999 FS report, which identified and evaluated remedial alternatives for the Site, evaluated bioremediation and concluded that the delivery of bioremediation agents throughout the affected area of groundwater would be very difficult at this Site. Nonetheless, one form of bioremediation (injection of a Hydrogen Release Compound) was pilot-tested in the groundwater at one area of the Site. It was not, however, successful in breaking down the volatile organic compounds.

MW-19 Area and Technical Impracticability Waiver Concerns

Comment #6: Several commenters requested clarification regarding the technical impracticability (TI) waiver that was proposed for the MW-19 Area.

Response #6: The restoration of contaminated groundwater is one of the primary objectives of the Superfund program. Experience at Superfund sites has shown, however, that the restoration of contaminated groundwater may not always be achievable from an engineering perspective.

It was concluded that because of the low permeability of the aquifer, groundwater extraction and treatment was not viable for the Site. Seven rounds of groundwater samples were collected as part of a natural attenuation study at the Site. Based upon its review, EPA concluded that while natural attenuation would be feasible for the contaminated groundwater for the majority of the Site, the data did not demonstrate that natural attenuation would address the tetrachloroethylene (PCE) and 1,1,1-

trichloroethane (1,1,1-TCA) contamination in the MW-19 Area (this area is approximately 120 ft by 80 ft to a depth of 30 ft.).

As part of a PRP-performed field test in December 2008, approximately 50 gallons of Hydrogen Release Compound (HRC) and approximately 35 gallons of HRC primer were injected in the MW-19 Area. The results of four rounds of subsequent sampling were inconclusive. EPA subsequently requested that the PRPs perform additional investigation to locate the source and, if located, then perform targeted treatment. The PRPs performed this investigation from September through December 2010. This work included the performance of a passive soil gas survey, collection of groundwater samples from the silt and sand/gravel zones beneath and around building debris that was buried on the Site, permeability testing, and hydraulic conductivity testing. Based on the results of this effort, EPA concluded that the source of the PCE and 1,1,1-TCA contamination had not been identified and further efforts to try to identify the source would likely be fruitless. Nevertheless, the building debris in this area was excavated and disposed off-Site at a permitted landfill by the PRP Group in August 2011.

EPA determined that the restoration of the groundwater in the MW-19 Area is technically impracticable from an engineering perspective due to the ineffectiveness of active remedies in the low permeable soils found at the Site, the limited mobility of the groundwater contamination (the contaminant plume is not migrating), and the inability to locate a source. Therefore, EPA proposed a technical impracticability waiver from the regulatory requirements of the federal Safe Drinking Water Maximum Contamination Levels and NYSDEC Water Quality Regulations for Groundwater.

MW-19 Area groundwater will continue to be monitored periodically to confirm that the TI zone is not expanding or moving vertically or horizontally, and no additional contaminants other than those waived are detected.

Comment #7: A commenter questioned why the contamination in the MW-19 Area could not be excavated.

Response #7: The contamination in the MW-19 Area is confined to the groundwater. Since the soil in this area is not contaminated, its excavation would not remediate the groundwater contamination.

Comment #8: A commenter asked whether an air sparging system or groundwater extraction system would be an appropriate technique to remove contamination in the MW-19 Area.

Response #8: Air sparging is an in-situ treatment method that consists of injecting air into the groundwater through drilled wells or driven points. Volatile organic constituents in groundwater partition into the injected air. The air and organic compounds then rise to the vadose zone where they are typically removed by a soil vapor extraction system. This method was considered in the 1999 FS, but was not retained for detailed analysis due to ineffectiveness. The low permeability soils at the Site would inhibit the effectiveness of injection and movement of air into and through the subsurface.

Groundwater extraction and treatment were also evaluated in the FFS. While this remedy would be implementable, it is severely limited in its effectiveness by the low permeability of the soils at the Site. Also contributing to the decreased effectiveness of such a remedy is the limited mobility of the groundwater contamination and the inability to locate a contamination source in the MW-19 area. There are also significantly higher capital and operation and maintenance costs associated with this remedy. As a result, it was determined not to be an appropriate remedy.

Comment #9: Several commenters expressed concern that a TI waiver was being sought for an area where a source cannot be found.

Response #9: Sufficient safeguards for the protection of human health and the environment are in place. Currently, there is no one on the Site using the groundwater for drinking water purposes. In addition, a deed restriction prohibits the installation and use of groundwater wells at the Site for drinking water purposes until drinking water standards have been met. Continued monitoring will ensure that the Site remains protective of human health until the cleanup levels have been achieved.

It should also be noted that the bedrock aquifer, which is used for potable purposes in the area, is not contaminated.

Private Well Concerns

Comment #10: Several commenters expressed concern that drinking water wells on their respective properties have not been adequately monitored.

Response #10: Within 1,000 ft of the Site boundary, there are nine private drinking water wells. They are all located upgradient or cross-gradient from the Site and are installed in bedrock. Therefore, they are not considered potential receptors of the affected groundwater. Based on over fifteen years of data, EPA has concluded that the contamination in the groundwater at this Site is confined to the shallow groundwater

unit. In addition, the relatively low concentrations observed in monitoring wells downgradient of the source areas suggest that the plume is not mobile, since the plume has not expanded since the 1999 RI. The private drinking water wells were sampled by the New York State Department of Health during the RI; no Site-related contaminants were detected. The residential well located closest to the Site was resampled in 2005. Site-related contaminants were not detected. For these reasons, EPA does not believe that monitoring is warranted for the private drinking water wells. However, since concerns related to contamination were expressed, the New York State Department of Health will sample several of residents' private drinking water wells.

Vapor Intrusion Concerns

Comment #11: A commenter expressed concerns about vapor intrusion.

Response #11: Because the groundwater contamination is not migrating beyond the Site boundary, vapor intrusion is not considered a concern for nearby residences. In the future, if any structure is constructed on the Site, a soil vapor intrusion study may be warranted.

APPENDIX V-a

Emails Submitted During the Public Comment Period

Tri cities Barrel SuperFund Site
Keevin Kenyon
to:
Young Chang
08/03/2011 03:10 PM
Hide Details
From: "Keevin Kenyon" <kkenyon1@stny.rr.com>

To: Young Chang/R2/USEPA/US@EPA

To whom it may Concern:

We have lived at 56 Pleasant Hill Rd. in Port Crane,NY since October 1982 and our property is bordered by Osborne Creek. In April 1988 our water well ceased to provide enough water and we had a new 300 ft. well drilled. The new well has a great deal of sediment and a significant amount of an unidentified gas. We initially drank the water but eventually switched to bottled water because of the strong odor and taste of the well water.

We previously opposed any modification to the soil and sediment portion of the remedy. We are also opposed to this modification unless it can be shown that a full hydrogeologic investigation has been completed and no risk to the communtiy exists.

Regards,

Keevin and Cheyanne Kenyon

To:
Cc:
Bcc:
Subject: Fw: http://www.pressconnects.com/article/20110815/NEWS01/108150364/-2-4M-effort-won-
From: Young Chang/R2/USEPA/US - Tuesday 09/06/2011 04:01 PM

----- Forwarded by Walter Mugdan/R2/USEPA/US on 08/17/2011 10:25 AM -----

----- Forwarded by Judith Enck/R2/USEPA/US on 08/16/2011 10:57 AM -----

From: JLi2533838@aol.com
To: Judith Enck/R2/USEPA/US@EPA
Date: 08/16/2011 10:39 AM
Subject: http://www.pressconnects.com/article/20110815/NEWS01/108150364/-2-4M-effort-won-

Would bio remediation be an option for cleanup here? James Little Endicott NY

http://www.pressconnects.com/article/20110815/NEWS01/108150364/-2-4M-effort-won-t-clean-up-Tri-Cities-Barrel-facility?odyssey=tab|topnews|text|FRONTPAGE

APPENDIX V-b

Public Notice

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY INVITES PUBLIC COMMENT ON THE PROPOSED MODIFIED GROUNDWATER REMEDY FOR THE TRI-CITIES BARREL SUPERFUND SITE

The U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation will hold a public meeting on August 16, 2011 at 7 p.m. in the Town of Fenton Town Hall, 44 Park Street, Port Crane, NY, to discuss EPA's Proposed Plan for Remedy Modification (Proposed Plan) for the Tri-Cities Barrel Superfund site. EPA is issuing the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, and Section 300.430(f) of the National Contingency Plan.

In 2000, EPA selected a remedy for the site that included the excavation of contaminated soils and sediments, followed by off-site treatment/disposal, and extraction and on-site treatment to address the contaminated groundwater. The soil and sediment portion of the remedy was implemented in 2003.

The Proposed Plan describes proposed changes to the groundwater component of the remedy and identifies the rationale for this preference. The main feature of the preferred modified groundwater remedy is the utilization of monitored natural attenuation to restore the groundwater instead of groundwater extraction and treatment.

The modified remedy described in the Proposed Plan is the preferred modified remedy for the site. Changes to the preferred modified remedy, or a change from the preferred modified remedy to another remedy, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the modified remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comments on the alternatives considered in the Proposed Plan and in the 2011 Focused Feasibility Study report because EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site.

The administrative record file contains the information upon which the selection of the response action will be based and is available at the following locations:

Fenton Town Hall	USEPA Records Center
44 Park Street	290 Broadway, 18th Floor
Port Crane, NY 13833	New York, NY 10007-1866

Responses to the comments received at the public meeting and in writing during the public comment period, which runs from July 31, 2011 to August 30, 2011, will be documented in the Responsiveness Summary section of an Amendment to the Record of Decision, the document that formalizes the selection of the modified remedy. All written comments should be addressed to: Young S. Chang, Remedial Project Manager, USEPA, 290 Broadway, 20th Floor, New York, NY 10007-1866, Fax: (212) 637-3966, or chang.young@epa.gov.mailto:

If you have any questions regarding the public meeting you can e-mail Ms. Cecilia Echols, Community Involvement Coordinator at: echols.cecilia@epa.gov, or call (212) 637-3678 or toll-free at 1-800-346-5009

Afghans arrest Taliban leader

Insurgent, official also detained

Associated Press

Marine Cpl. Patrick Ducey, 21, of Garfield, N.J., left, and Lance Cpl. Charlie Quintana, 22, of Manhattan, rest for a moment while hiking down from an observation point Saturday, in Helmand province, Afghanistan. ASSOCIATED PRESS

KABUL, Afghanistan — A senior Defense Ministry official who allegedly leaked secrets that helped the Taliban stage suicide attacks in Kabul has been arrested by the Afghan Intelligence Service — one of three high profile arrests announced Saturday by the agency.

A spokesman said also arrested were a senior Taliban official accused of leading an insurgent propaganda campaign in eastern Afghanistan, and an insurgent who allegedly helped organize an April 1 attack against the U.N. headquarters in the northern city of Mazar-i-Sharif that killed 11 people, including seven foreign U.N. employees.

Infiltration has become a serious concern for Afghan forces and the U.S.-led military alliance that is training them — often on bases they share. The Taliban have said the practice has become one of their main strategies in their war against the U.S.-led coalition and President Hamid Karzai's government.

Several attacks involving bombers wearing military uniforms have targeted foreign troops as well as official Afghan institutions, including an April suicide bombing by an attacker wearing an army uniform that killed three people at the Defense Ministry.

The intelligence service recently arrested Gul Mohammad, an army officer who was serving at the Defense Ministry headquarters in Kabul, the agency's spokesman Lutifullah Mashal said at a news conference.

531261