RECORD OF DECISION

Mohonk Road Industrial Plant Superfund Site

Hamlet of High Falls,
Towns of Marbletown and Rosendale
Ulster County, New York

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

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Mohonk Road Industrial Plant Site

Superfund Identification Number: NYD986950012

Hamlet of High Falls, Towns of Marbletown and Rosendale

Ulster County, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedy for the Mohonk Road Industrial Plant Superfund Site, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for the Site. The information supporting this remedial action decision is contained in the administrative record. The index for the administrative record is attached to this document (APPENDIX III).

The New York State Department of Environmental Conservation (NYSDEC) concurs with the selected remedy. A letter of concurrence from the NYSDEC is attached to this document (APPENDIX IV).

ASSESSMENT OF THE SITE

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

DESCRIPTION OF THE SELECTED REMEDY

The remedial action described in this document addresses contaminated soil and groundwater at the Mohonk Road Industrial Plant Site. The Site includes the Mohonk Road Industrial Plant property as well as those areas impacted by the groundwater plume emanating from the property. This remedial action supplements a non-time critical removal action (NTCRA) undertaken by EPA to address the most contaminated portion of the groundwater plume, and interim remedial measures taken by NYSDEC to provide granular activated carbon (GAC) filters for residential and commercial wells with volatile organic compounds (VOCs) above New York State (NYS) Maximum Contaminant Levels (MCLs), and to remove a 1000-gallon tank which was the major source of contamination.

Selected Groundwater Response and Alternate Water Supply Remedy

The selected groundwater and potable water supply remedy includes:

- Extraction of contaminated groundwater in the nearfield and farfield plume to restore the aquifer to its most beneficial use (as a potable water supply), treatment with an air stripper, and discharge of the treated water to the Rondout Creek and Coxing Kill. The "nearfield plume" refers to that portion of the groundwater plume with total VOC concentrations greater than 1,000 parts per billion (ppb), while the "farfield plume" refers to the component of the groundwater plume with 10 ppb to 1,000 ppb total VOCs. The nearfield plume will be addressed through long-term operation of the NTCRA groundwater extraction and treatment system. The farfield plume will be addressed through the construction and long-term operation of an additional extraction and treatment system.

- The construction of a public water supply system to provide potable water to the residences and businesses in the Towns of Marbletown and Rosendale with impacted or threatened private supply wells. The primary water supply for the system will be the Catskill Aqueduct. The individual GAC filtration systems currently in use will be operated until the new public water supply system is operational.

- Implementation of a groundwater monitoring program to evaluate the effectiveness of the remedy.

- Institutional controls may be employed to prevent future use of the bedrock aquifer in the impacted or threatened area.

Selected Source Control Remedy

The major components of the selected source control remedy for contaminated soil include:

- Excavation of VOC-contaminated soils with concentrations above the cleanup criteria to prevent or minimize cross-media impacts from contaminants of concern in soil to the underlying groundwater.

- Off-site disposal of the contaminated soil at appropriately permitted facilities.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA §121. It is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective.

The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable, and the groundwater remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., it reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but will take more than five years to attain remedial action objectives and cleanup levels in the groundwater, a policy review may be conducted no less often than each five years after completion of the construction of the remedial action components for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

DATA CERTIFICATION CHECKLIST

The Decision Summary of this ROD contains the remedy selection information noted below. More details may be found in the administrative record file for this Site.

- Chemicals of concern and their respective concentrations (see pages 10 through 16, and TABLES 1 through 8 on pages II-1 through II-47);

- Baseline risk represented by the chemicals of concern (see pages 18 through 24, and TABLES 8 through 13 on pages II-44 through II-64);

- Cleanup levels established for chemicals of concern and the basis for these levels (see pages 25 and 26, and TABLE 14 on page II-65);

- How source materials constituting principal threats are addressed (see page 48);

- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see pages 17 and 18);

- Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see page 54 and 55);

- Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see pages 44, 47, 53 and 54, and TABLES 15 through 17 on pages II-66 through II-70); and,

- Key factor(s) that led to selecting the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (see pages 48 and 49).

AUTHORIZING SIGNATURE

Jeanne M. Fox
Regional Administrator

3/31/00
Date

DECISION SUMMARY

Mohonk Road Industrial Plant Superfund Site

Hamlet of High Falls,
Towns of Marbletown and Rosendale
Ulster County, New York

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

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SITE NAME, LOCATION AND DESCRIPTION

The Mohonk Road Industrial Plant (MRIP) Superfund Site (the Site) is located in the Hamlet of High Falls, Ulster County, New York, approximately 7 miles north-northwest of the Village of New Paltz and 10 miles south-southwest of the City of Kingston. The Hamlet of High Falls is situated within two townships, the Towns of Marbletown and Rosendale (see FIGURE 1). The MRIP Site was added to the National Priorities List (NPL) on January 19, 1999; the Superfund identification number for the Site is NYD986950012. The New York State Department of Environmental Conservation (NYSDEC) served as the lead agency for the Remedial Investigation and Feasibility Study (RI/FS) which was initiated prior to the Site being placed on the NPL. The United States Environmental Protection Agency (EPA) has assumed the role as lead agency with issuance of this Record of Decision. The likely source of cleanup monies is the Superfund trust fund.

The MRIP Site includes the Mohonk Road Industrial Plant property located at 186 Mohonk Road (the MRIP property), and all surrounding properties that have been impacted by the contaminated groundwater plume emanating from the MRIP property (off-MRIP property). The MRIP property consists of approximately 14.5 acres of mostly undeveloped land with a 43,000 square foot building in its southern corner. The Site-related groundwater plume extends approximately 4,000 feet from the MRIP property and has adversely impacted at least 71 residential, commercial and/or municipal water supply wells as of this date.

The Site is located in an area of primarily residential development. There are approximately 159 households and 412 people residing within a 1-mile radius of the Site. Groundwater is the primary source of drinking water in the Hamlet of High Falls. Industrial activities have taken place on the MRIP property since the early 1960's. The MRIP property is currently zoned for light industrial use, and the most reasonably anticipated future use for the MRIP property is light industrial use.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

History

The MRIP property has been used for industrial purposes since the early 1960's. From the early 1960's to 1972, Varifab, Inc., a metal finisher, owned and occupied the Site and reportedly used solvents in the finishing and assembly of metal parts for card punch machines and computer frames. From 1972 to 1975, a wet spray painting company, R.C. Ballard Corp., operated at the Site. This type of painting operation would require large quantities of solvents in order to clean surfaces prior to painting. The Site was purchased in 1976 by Daniel Gelles; Daniel E. Gelles Associates, Inc. manufactured store display fixtures which may have involved the use of solvents. Banco Popular de Puerto Rico foreclosed on the MRIP property in 1992. The Site is currently owned by Kithkin Corp., which purchased the property at auction in 1993, and currently leases the northeastern section of the building to a small woodworking company.

The Site first came to the attention of State and local authorities in April 1994 when a resident near the MRIP property contacted the Ulster County Health Department (UCHD) concerning the quality of her drinking water. The resident's well was sampled in April 1994 by UCHD and was found to contain elevated levels of volatile organic compounds (VOCs). Additional sampling was performed by UCHD and, to date, residential well sampling has identified 71 other homes or businesses downgradient of the Site with VOCs above Federal and/or New York State (NYS) Maximum Contaminant Levels (MCLs). NYSDEC began investigating the MRIP Site in 1994. As an interim action to address immediate health threats, NYSDEC installed granular activated carbon (GAC) filters at preexisting homes or businesses whose wells exceeded the NYS MCLs [5 parts per billion (ppb), or micrograms/liter, for individual VOCs]. UCHD is currently monitoring domestic wells on the perimeter of the plume to ensure that the water continues to be safe for domestic use.

In August 1994, NYSDEC designated the MRIP Site as a Class 2 site on the New York State Registry of Inactive Hazardous Waste Sites. The Class 2 designation indicated that the Site posed a significant threat to public health and the environment. In the fall of 1996, NYSDEC contracted Lawler, Matusky & Skelly Engineers LLP (LMS) to conduct an Immediate Investigation Work Assignment (IIWA). An additional IIWA was tasked to LMS by NYSDEC in the spring of 1997. As an interim action, NYSDEC excavated a tank believed to be the major source of groundwater contamination at the Site, along with approximately 25 tons of contaminated soil in September 1997. This tank was originally installed as part of a septic system, but subsequently was also used for solvent disposal at the Site; hereinafter it is referred to as the "disposal tank." In 1997, after repeated, unsuccessful attempts to have a responsible party fund the Site investigation and cleanup, NYSDEC contracted LMS to conduct a RI/FS. The RI and FS Reports were issued by NYSDEC in September 1998 and March 1999, respectively.

On March 11, 1998, the EPA received a request from the NYSDEC to evaluate a proposed Interim Response Measure (IRM) at the MRIP Site as a removal action under CERCLA. EPA determined that a sufficient planning period existed before Site activities for the removal action had to be initiated, and accordingly, this response was conducted as a non-time critical removal action (NTCRA). The NTCRA has involved construction of a groundwater extraction and treatment system which is designed to minimize the further migration of the most highly contaminated portion of the groundwater plume in the bedrock aquifer. EPA issued a Proposed Response Action document for this interim groundwater action on February 26, 1999. The Action Memorandum for the NTCRA was finalized on June 4, 1999. As part of the NTCRA, throughout 1999, EPA conducted additional field work to characterize the Site. The NTCRA groundwater extraction and treatment plant is expected to become operational in Spring 2000.

Enforcement Activity

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The following PRPs have been identified with regard to the Mohonk Road Industrial Plant Site: Varifab, Inc., R.C. Ballard Corporation, Daniel E. Gelles Associates, Inc., Mr. Daniel E. Gelles, and Kithkin Corporation. With the exception of Kithkin Corp., which is a current owner, all of the identified PRPs are former owners and/or operators of 186 Mohonk Rd., the source of the release of hazardous substances from the Site.

The PRPs declined the opportunity to perform the RI/FS at the Site when requested by the NYSDEC. EPA issued Notice of Liability letters to Kithkin Corporation, Mr. Daniel E. Gelles and Daniel E. Gelles Associates, Inc. Each of the three PRPs were offered the opportunity to perform a NTCRA at the Site. The PRPs declined to undertake the removal action. EPA's PRP search efforts are ongoing.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

NYSDEC prepared a Citizen Participation Plan for the Site, dated June 1997. The Citizen Participation Plan included a community profile and contact list, and has also been used by EPA for its community outreach efforts at the Site. Site reports have been made available for public review at information repositories at the EPA Docket Room in Region II, New York, the Stone Ridge Library, Stone Ridge, New York, and the Rosendale Public Library, Rosendale, New York.

EPA participated in a public meeting hosted by NYSDEC on October 28, 1998 to discuss the RI and the preliminary results of the FS. At the October 1998 meeting, EPA presented the preliminary findings of its Engineering Evaluation and Cost Analysis (EE/CA) report, which reviewed alternatives for the NTCRA.

EPA issued a Proposed Response Action document for the NTCRA on February 26, 1999. The EE/CA, the Removal Site Evaluation (RSE), and a Site Fact Sheet were made available for review at the information repositories for the Site. On March 22, 1999, EPA conducted a public meeting at the High Falls Firehouse to discuss the NTCRA and to receive public comments.

EPA mailed an updated Fact Sheet for the Site to all persons on the Site mailing list in June 1999 and hosted a public availability session to discuss the NTCRA and potential long-term cleanup plans on June 17, 1999. Another updated Fact Sheet was mailed to all persons on the Site mailing list in October 1999 and another public availability session was hosted by EPA on November 3, 1999.

A Technical Assistance Grant (TAG) was awarded to the High Falls Water Coalition (HFWC) on September 2, 1999. The HFWC sent out two newsletters to people on the Site mailing list in October 1999 and January 2000. HFWC has selected two firms, Rhode, Soyka & Andrews, and Leggette, Brashears & Graham, to provide technical input on remedy selection and design.

The Proposed Remedial Action Plan (or Proposed Plan) was prepared by NYSDEC, with consultation by EPA, and finalized in November 1999. A notice of the Proposed Plan and public comment period was placed in the Daily Freeman on November 15, 1999 consistent with the requirements of NCP §300.430(f)(3)(i)(A), and a summary of the Proposed Plan was mailed to all persons on the Site mailing list. The Proposed Plan was made available for review at the information repositories for the Site. Prior to the onset of the public comment period, EPA received a request from the HFWC that the comment period be established for 60 days rather than 30 days. The public comment period was scheduled from November 15, 1999 to January 15, 2000, but was extended to February 15, 2000 to accommodate additional requests for an extension. EPA hosted a public meeting on December 2, 1999 to discuss the Proposed Plan. At this meeting, representatives from EPA and NYSDEC answered questions about contamination at the Site and the remedial alternatives. EPA's responses to comments received during the public meeting, along with responses to other written comments received during the public comment period, are included in the Responsiveness Summary (APPENDIX V).

SCOPE AND ROLE OF RESPONSE ACTION

Cleanup at the Site is currently being addressed as one operable unit (OU). To date, the following interim actions have occurred at the Site:

- removal of the major source of contamination (a 1000-gallon disposal tank) by NYSDEC in 1997, and 25 tons of contaminated soil;
- installation of GAC filters on 70 homes and businesses adversely impacted by the VOC plume; and
- installation of a groundwater extraction and treatment system as part of the NTCRA undertaken by EPA, to minimize the further migration in the bedrock aquifer of the most highly contaminated portion of the groundwater plume.

This Record of Decision (ROD) describes the comprehensive long-term remediation plan for the entire Site, which will incorporate the above actions, and is expected to be the only ROD issued for the Site. The components of this ROD will:

- address soils above cleanup objectives which are a source for groundwater contamination;
- provide an alternate water supply for impacted and threatened residences; and
- address the long-term remedial action for the nearfield and farfield components of the VOC plume. The "nearfield plume" refers to that portion of the groundwater plume with total VOC concentrations greater than 1,000 ppb, while the "farfield plume" refers to the component of the groundwater plume with 10 ppb to 1,000 ppb total VOCs.

The interim actions described above will be incorporated through long-term operation of the NTCRA, and continued maintenance of the GAC filters until the comprehensive groundwater and alternate water supply remedy can be implemented.

SUMMARY OF SITE CHARACTERISTICS

The purpose of the RI was to define the nature and extent of contamination resulting from previous industrial activities at the MRIP property. NYSDEC's fieldwork for the RI was conducted from April 1997 to December 1997, and April 1998 to June 1998. The RI Report was issued by NYSDEC in September 1998.

The RI included the following activities:

- private water well survey and sampling;

- soil borings and sampling;
- test pit excavation and subsurface soil sampling;
- tracing drain lines from the building to determine additional contamination source areas on the MRIP property;
- surface water sampling;
- groundwater monitoring well installation and sampling;
- groundwater flow monitoring analysis and water table elevation monitoring;
- groundwater pump tests;
- human health exposure assessment; and,
- habitat assessment.

In 1999, additional site characterization was performed by EPA's Removal Program in order to implement the NTCRA. This work consisted of:

- geophysical investigations;
- installation of additional monitoring and extraction wells;
- groundwater sampling and pump tests;
- groundwater modeling;
- ecological study of the Coxing Kill creek;
- residential well sampling and surveys;
- soil test pitting and contaminated soil removal.

To determine which media (soil, groundwater, air, etc.) contain contamination at levels of concern, the analytical data were compared to applicable or relevant and appropriate requirements (ARARs), or other relevant guidance if no ARARs were available.

Based upon the results of the RI and the additional EPA field investigations, it is clear that soil and groundwater at the Site require remediation. Results of these investigations are summarized in this Record of Decision; however, more complete information can be found in the RI and the relevant Technical Memoranda (that document the Removal Program's field activities which are relevant to this ROD). Documents are included in the administrative record for the Site (APPENDIX III), and are available at the Site information repositories.

Physical Site Conditions

The MRIP property consists of approximately 14.5 acres of mostly wooded, undeveloped land and a 43,000 square foot building in the southern corner of the property (FIGURE 2). Two production wells are located within the building. The area south of the building consists of a large lawn and a gravel driveway. The gravel drive wraps around the sides of the building, providing access to loading docks along the western end of the building. The lawn and driveway slope gently down to a culvert that passes beneath Mohonk Road allowing surface runoff to drain from the property. The small open area immediately west of the building is level to the edge of the driveway. The NTCRA treatment plant has been constructed in this area.

The Site is located in an area of chiefly residential development. The MRIP property is bounded on the southeast by Mohonk Road and to the northeast, northwest, and southwest by residential properties on large wooded lots. The property to the south is currently used to store machinery and trucks utilized for paving operations. Approximately 159 households and 412 people reside within a one-mile radius of the MRIP property. Groundwater is the primary source of drinking water within four miles of the MRIP property. The nearest residential drinking water wells are located within 500 feet of the building located on the MRIP property.

The nearest permanent watercourses to the Site are the Rondout Creek (Class B waters; Waters Index #139-14, Part 855.4) and Coxing Kill creek (Class C[T] waters, Waters Index #139-14-9, Part 855.4). Rondout Creek is not stocked with trout near the Site by either NYSDEC or the Ulster County Federation of Sportsmen. The creek is popular with recreational anglers, who fish for warmwater species such as smallmouth bass.

The Catskill Aqueduct, which passes about 700 ft to the south of the MRIP property, is owned by the City of New York and maintained by the New York City Department of Environmental Protection (NYCDEP). This aqueduct supplies water to the New York City Reservoir System from the Ashokan Reservoir via an underground tunnel. The tunnel, as it passes through the Rondout Valley area in High Falls, is 14.5 feet in diameter, is about 500 feet below grade and is lined with concrete. A siphon house for the aqueduct (the Rondout Dewatering Chamber) is located approximately 1,200 feet west of the MRIP property.

Geology and Hydrogeology

The Site is located in the Northern Shawangunk Mountain region where the Shawangunk Formation is the dominant rock type. The Shawangunk Formation is principally interbedded orthoquartzite sandstone and conglomerate that is highly resistant to erosion. It has essentially no primary porosity and permeability, and only secondary fracture porosity and permeability exist, which are the primary controls on groundwater flow and the hydraulic properties of the Shawangunk Fractured Bedrock Aquifer System (SFBA). The fractures are highly variable in geometry and density making the flow conditions highly variable and localized, causing the aquifer to have poor groundwater storage capacity. This aquifer is recharged directly by precipitation on exposed bedrock areas and by infiltration through the overburden material. The MRIP property is found near a topographical high and serves as a recharge area for the bedrock aquifer. In general, the migration of groundwater from the Site is to the north-northeast toward Rondout Creek, which lies approximately 5,000 feet north of the Site (see water contour map, FIGURE 3). Vertical flow gradients on the MRIP property are clearly downward. However, artesian or upward groundwater flow has been reported in residential wells along Berme Road near the Rondout Creek and has been observed in a monitoring well near this location.

The Shawangunk Formation is locally overlain by the High Falls Shale. The locations of geologic cross-sections are shown in FIGURE 4, an actual cross section is shown in FIGURE 5, and a more localized geological cross section is shown in FIGURE 6. Much of the bedrock in the area is unconformably overlain by lodgement till. These deposits thinly mantle most of the area, with depths ranging from 9 to 28 feet on the MRIP property, and from 7 to 85 feet in off-MRIP property wells. The till (hereinafter "overburden") consists of a nonstratified and poorly sorted mostly silt and fine grained sand matrix with coarser clasts predominantly of sandstone-quartzite composition. The compactness of this till inhibits rapid infiltration and subsurface water movement. The soil or overburden groundwater is limited and is not widely used as a source of potable water. There are a number of springs in the area which are used as sources of water by some residents. Sampling indicates that these springs are not contaminated by Site-related chemicals.

Previous pumping tests conducted as part of a study by an organization known as Mohonk Preserve, Inc. concluded that the SFBA is a very poor aquifer with regard to its low storitivity values. Well yields were found to be highly erratic and the average production figures do not assure successful well installation. Despite this, nearly the entire potable water supply for the Hamlet of High Falls comes from individual groundwater wells. Highly variable water levels within very short distances indicate that the SFBA is comprised of distinct fracture networks that are only locally interconnected.

Three distinct water bearing zones were identified in the RI: an overburden flow zone, a bedrock interface flow zone (at the shallow soil/bedrock interface), and a bedrock flow zone (the SFBA). Throughout this ROD, monitoring wells installed to these depths are referred to as overburden, interface, and bedrock (or SFBA) wells, respectively.

In order to better evaluate alternatives for alternate water supplies and plume control systems, a groundwater flow model (MODFLOW®) was developed as part of the FS. The modeling study was used to predict the effect that groundwater pump and treat systems would have on continued use of private wells as a water source and plume migration, as well as to predict the bedrock aquifer response to the water supply alternatives. The model assumed that the NTCRA extraction and treatment system was operational (pumping at 40 gallons per minute), and evaluated the plume migration when the private (primarily residential) wells were pumping as well as when the wells were taken out of service. Important conclusions drawn from the model include:

- The model indicated that if the residential wells were pumping, the VOC groundwater plume would continue to migrate north and northwest towards the Rondout Creek and northeast towards the Coxing Kill (FIGURE 7).

- The model also indicated that if the residential wells were taken out of service, the groundwater plume would migrate north and northwest towards Rondout Creek and northeast towards the Coxing Kill at a more rapid rate (FIGURE 8). Both models indicated that the plume would be drawn into currently unimpacted private wells (a section of properties near Rondout Creek). In other words, if a public water supply were implemented, an aquifer-wide groundwater extraction and treatment system would be needed to prevent the plume from migrating further.

EPA performed additional groundwater modeling (using the TIMES model) to determine optimal rates of groundwater extraction, and expected water table drawdown, for the NTCRA. The modeling is described in a June 15, 1999 Technical Memorandum, which is part of the administrative record for the Site. The maximum estimated water table drawdown in the closest residential well is expected to be approximately 20 feet based on the extraction model simulating steady-state conditions. Initially, the drawdown at this well will be substantially less than 20 feet, and it would take several years to reach this level of steady-state drawdown. As part of the NTCRA, EPA will install monitoring devices in the monitoring wells near Mohonk Road; therefore, there will be sufficient time to monitor the drawdown levels and reduce the rates of extraction prior to any adverse impact on nearby wells.

In order to locate zones of groundwater entry into monitoring wells, to determine optimum sampling depths, and to better define lithology, downhole geophysical investigations were performed by

NYSDEC and EPA's Removal Program. NYSDEC geophysically logged several wells off the MRIP property and one well on the MRIP property. In September 1999, EPA's Removal Program geophysically logged several wells on the MRIP property. The NYSDEC logging identified water producing fractures throughout the vertical extent of bedrock, at depths ranging from 37 to 194 feet. The results of the NYSDEC geophysical study correlate well with observations made during well drilling. FIGURE 8 shows a geologic cross section as compiled from the monitoring well boreholes. The geophysical logging performed by EPA's Removal Program found fractures at depths of 20 to 176 feet below ground surface, and the results suggested the presence of thin interbeds of a finer-grained material.

Soil, Sediment and Surface-Water and Groundwater Contamination

The field work and sampling performed during the RI and additional field studies during the removal action characterized the nature and extent of chemical contamination at the MRIP Site. A general discussion of these findings is presented below, organized by media sampled (e.g., soil, groundwater). See TABLES for analytical data; see the RI and the technical reports by EPA's Removal Program for a more complete examination of the analytical results. This information is available in the administrative record (index attached as APPENDIX III).

Drum and Sludge (Disposal Tank) Sampling

During Phase I and Phase II Environmental Assessments performed by Enviropact, Inc. for Banco Popular in 1992 and 1993, respectively, 10 drums were found on the MRIP property and subsequently sampled. Samples from these drums contained the following VOCs: 1,1-dichloroethene (DCE), toluene, 1,1,1-trichloroethane (TCA), ethylbenzene, and xylene.

Sludge samples collected from the 1000-gallon disposal tank on the MRIP property during NYSDEC's IIWA were found to contain 26% TCA (260,000 milligrams/kilogram, or mg/kg) and DCE at 18,000 mg/kg (TABLE 1). The disposal tank is believed to have been the major source of groundwater contamination, and was excavated with approximately 25 tons of contaminated soils by NYSDEC in September 1997 as an interim remedial measure.

Groundwater Sampling

The results of the Site investigations indicate that a VOC groundwater plume exists in the SFBA at the Site with VOCs above Federal and NYS MCLs [40 CFR Part 141.11-141.16 and Part 141.60-

141.63, and New York Code of Rules and Regulations (NYCRR) Title 10, Chapter I, Subpart 5-1, respectively]. An approximately 170-acre groundwater plume with total VOC concentrations of at least 10 ppb extends a distance of about one mile to the north of the MRIP property. The extent and concentration levels of the bedrock groundwater contamination are depicted in FIGURE 9. For the most part, total VOCs consisted of TCA, the contaminant typically found in highest concentrations at the Site, and its degradation products (e.g., 1,1-dichloroethane (DCA) and DCE). In addition, trichloroethene (TCE) was also frequently detected in groundwater wells. The NYS MCL for each of these VOCs is 5 ppb.

From 1996 to 1998, NYSDEC installed eleven monitoring wells on the MRIP property, and eleven monitoring wells off the MRIP property. Of the wells installed on the MRIP property, five are interface wells (MRMW-1, -2, -3, -4, and -5), four are bedrock monitoring wells (MRMW-1B, -5B, -6B, and -7B), and two are bedrock extraction wells (MRMW-5R and -7R) (see FIGURE 2). As part of the NTCRA, EPA's Removal Program later installed four additional wells on the MRIP property (ERT-1, ERT-2, ERT-3, and ERT-4), which are all bedrock extraction wells (see FIGURE 10). Of the wells installed by NYSDEC off the MRIP property, two are overburden wells (MRMW-9, and -11), and nine are bedrock monitoring wells (MRMW-8B, -9B, -10B, -11B, -11C, -12B, -13B, -14B, and -15B) (see FIGURE 9).

Six rounds of groundwater monitoring well samples for the RI were collected by NYSDEC in November 1996, May 1997, September 1997, December 1997, May 1998, and October 1998. Not all monitoring wells were sampled during each sampling event. Two additional rounds of groundwater sampling were performed by EPA's Removal Program in March (wells on the MRIP property) and October 1999 (all Site monitoring wells).

The RI concluded that contamination entered the bedrock groundwater near the former disposal tank and spread northward from the MRIP property in the SFBA. The most concentrated portion of the groundwater VOC plume was detected in wells near the former disposal tank (indicated on FIGURE 2). Interface well MRMW-4 is located next to the former disposal tank, and a sample collected from this monitoring well in November 1996 was found to contain 87,000 ppb of TCA; 10,000 ppb of DCE; 6,700 ppb DCA, and 3,300 ppb of TCE. Subsequent rounds of sampling confirmed elevated levels of these VOCs in this well, and although levels decreased significantly after the disposal tank was removed by NYSDEC in August 1997, the levels of VOCs remain elevated well above NYS or EPA MCLs. For example, TCA was detected at 15,000 ppb in May 1998 and at an estimated 6,800 ppb in October 1999 (see TABLES 2 and 3).

Samples from the nearest downgradient bedrock monitoring well, MRMW-5B, were also found to have elevated levels of TCA, DCA, DCE and TCE. The total VOC levels found in this well were consistently greater than 1,000 ppb during sampling performed for the RI. The levels of TCA found in MRMW-5B were 4,900 ppb in September 1997; 1,800 ppb in December 1997; and 2,800 ppb May 1998. Monitoring well sampling of MRMW-5B completed since the conclusion of the RI has indicated that the contaminant levels in this well have not appreciably decreased (2,900 ppb TCA in October 1999). MRMW-5R had similar, although lower, levels of contaminants as MRMW-5B, e.g., 1,300 ppb TCA in May 1998.

The sampling results from ERT-1, -2, -3, and -4 (installed on the MRIP property in 1999 by EPA's Removal Program) have also confirmed elevated VOC levels on the MRIP property. Of the four ERT wells, ERT-4 is closest to the location of the former disposal tank which was the major source of contamination, and had the highest VOC total (an estimated total of 7,510 ppb TCA, DCA, DCE and TCE in October 1999). ERT-1 is also located within the nearfield plume, with an estimated total of 1,764 ppb TCA, DCA, DCE and TCE in October 1999. VOC levels in ERT-2 and ERT-3 are considerably lower, with estimated totals of TCA, DCA, DCE and TCE of 452 ppb and 195 ppb in October 1999, respectively (TABLE 3).

The flow direction of the nearfield plume has a westward component, as is evidenced by the monitoring results for MRMW-7B. MRMW-7B is approximately 400 feet northwest of the former disposal tank, and had elevated levels of TCA and related compounds. The VOC levels in this well have fluctuated dramatically, with TCA levels of 28 ppb (May 1997), 1,600 ppb (September 1997), 930 ppb (December 1997), and 54 ppb (May 1998). VOC levels are also elevated in MRMW-7R, which is located immediately adjacent to MRMW-7B, with 970 ppb of TCA detected in May 1998.

Monitoring well data also indicates that upon release into the overburden, the contaminants migrated into the bedrock aquifer without significant lateral movement. For example, interface monitoring well MRMW-5 (14.5 feet deep) is located less than 100 feet downgradient of MRMW-4 (19.5 feet deep) but is significantly less impacted than MRMW-4, with the highest detection of TCA at 51 ppb in the December 1997 sampling round (compared to 28,000 ppb TCA detected in MRMW-4 during this sampling round). However, the bedrock well nearest MRMW-5 (MRMW-5B, 34 feet deep) has been significantly impacted by VOCs, as previously discussed. This indicates that the contamination is moving vertically downward on the MRIP property directly into the underlying bedrock aquifer. No VOCs above the 5 ppb groundwater standard have been detected in off-MRIP property overburden wells MRMW-9 and MRMW-11, confirming that the contaminant plume entered the SFBA before the plume migrated from the MRIP property.

Data from monitoring wells installed off the MRIP property have helped to delineate the extent of the groundwater plume. The off MRIP property bedrock monitoring well MRMW-11B was drilled to a depth of 181 feet; TCA was detected at 540 ppb in May 1998 and 190 ppb in October 1999. Further downgradient, levels of TCA in monitoring well MRMW-12B have ranged from an estimated 5 ppb (December 1997) to 190 ppb (October 1999), and levels of TCA in MRMW-15B have ranged from 340 ppb (May 1998) to 380 ppb (October 1999). Monitoring wells MRMW-12B and MRMW-15B are located approximately 1,600 feet downgradient from the former disposal tank.

Sampling using packers to isolate fracture zones was conducted on MRMW-11B, MRMW-12B and the MRIP production well MRPW-2 in order to characterize the vertical extent of contamination; the results are summarized in TABLE 4. A sample from MRMW-11B taken at 181 feet below grade during packer testing had an estimated 628 ppb of total VOCs. The levels of total VOCs detected in MRMW-12B during packer testing were 604 ppb (at 40 feet below grade), 598 ppb (at 60 feet below grade), and 312 ppb (at 80 feet below grade). These values are significantly higher than those detected in this well during the 1997 and 1998 rounds of sampling. TABLE 5 indicates the bottom elevations of interface well MRMW-4 and bedrock well MRMW-5B, the elevations of known contaminated fractures in MRMW-11B, MRMW-12B, and MRPW-2, the elevation of fractures (detected during drilling) in MRMW-5R and MRMW-11C, the distance from the former disposal tank, and the total VOC levels found in each well. The data indicates that contamination generally exists deeper in the aquifer with distance downgradient from the MRIP property; however, the contamination in MRMW-12B is found at a higher elevation than that in MRMW-11B, which is located closer to the MRIP property. This illustrates that contaminated fractures are located throughout the vertical extent of the SFBA which exhibit localized vertical flow patterns (i.e., vertically downward from MRMW-4 to MRMW-11B, then upward from MRMW-11B to MRMW-12B).

Monitoring wells located upgradient of the MRIP property were also tested during the remedial investigation, but none were found to contain TCA or other VOCs at concentrations above NYS or Federal MCLs.

Elevated levels of naturally occurring metals (primarily iron, manganese, calcium, and magnesium) have been detected at the Site and have also been observed in the background overburden and bedrock wells; the levels fluctuated dramatically during the sampling rounds, for example, the levels of iron in MRMW-7R ranged from 10,300 ppb in May 1998 to 38 ppb in October 1999. Only a few inorganics were detected above their respective MCLs. Arsenic was detected above Federal MCLs in samples from MRMW-8B in September 1997 (76 and 26 ppb in total and dissolved samples, respectively), but not during subsequent sampling. The Federal MCL for arsenic is 50 ppb. Barium has been detected at levels above Federal MCLs in MRMW-14B (3,800 ppb and 3,660 ppb in total and dissolved samples, respectively, from September 1997; and 3,390 ppb in December 1997) and MRMW-8B (4,350 ppb in October 1999), but subsequent samples were not above MCLs. The Federal MCL for barium is 2,000 ppb. Antimony has been detected in dissolved samples from MRMW-1B (September 1997), MRMW-6B (September 1997), and MRMW-10B (December 1997), at low levels below the Federal MCLs. The Federal MCL for antimony is 6 ppb. No inorganic chemicals have been retained as chemicals of concern.

Residential Well Sampling

The maximum concentrations of TCA, TCE, DCE, and DCA detected during UCHD residential and business well sampling were: 4,700 ppb TCA and 270 ppb TCE in one residential well located over 1,000 feet downgradient of the MRIP property, 270 ppb DCE in a residential well over 1,100 feet downgradient of the MRIP property, and 260 ppb DCA in a residential well located over 200 feet downgradient of the MRIP property. Since the discovery of the Site in 1994, the UCHD has continued to monitor residential wells on the perimeter of the plume to ensure that the water in these wells continues to be safe for domestic use. The results from residential and business well sampling conducted by NYSDEC during the RI found a maximum concentration of 880 ppb TCA, and a maximum total VOC concentration of 1,077 ppb in a residential well more than 750 feet downgradient of the MRIP property. Approximately 230 residential and/or business wells in the Towns of Marbletown and Rosendale have been sampled as part of the UCHD, NYSDEC and/or EPA sampling events.

Surface Water

Samples were collected from various ponds and other water bodies downgradient of the MRIP property. With the exception of the cistern located just north and downgradient of the MRIP property, none of the samples were contaminated with Site-related contaminants. The cistern was 10-12 feet in depth and contained approximately a foot of water at the bottom. This water was more indicative of groundwater at the bedrock interface than surface water. The sample, collected in July 1997, contained TCA at 43 ppb and DCE at 4 ppb, which is consistent with interface monitoring well MRMW-5 located on the MRIP property, approximately 300 feet upgradient of the cistern. VOCs have not been detected in samples collected from springs which are used by some residents in the area.

EPA sampling in 1999 indicated the Rondout Creek and Coxing Kill are not contaminated with Site-related chemicals. For additional details on the Rondout Creek sampling event see the Removal Program sampling trip report, dated April 8, 1999, and the data validation reports dated June 3, and June 21, 1999. For additional details on the Coxing Kill sampling see Interim Report 2, Ecological Evaluation of the Proposed Effluent Discharge to the Coxing Kill Creek From the Mohonk Road Industrial Plant Site. These reports are part of the administrative record.

Surface and Subsurface Soils

The 1000-gal underground disposal tank with two concrete access covers, removed by NYSDEC in August 1997, was located just over 100 feet north of the building in a wooded area. NYSDEC used radiodetection in conjunction with the excavation of test pits at strategic points around the building to trace the influent and effluent lines for the disposal tank, and identify drain lines exiting the building that might lead to other potential source areas. The locations of test pits, test pit samples, and identified drain lines are depicted on FIGURE 11.

RI samples were collected by using a direct push soil sampler and through the excavation of test pits and trenches. The excavations uncovered drain lines originating from inside the north, east, and west sides of the building. Subsurface soils samples were also collected from three locations inside the building. The soil data from the RI indicate that contaminated subsurface soils remain in the vicinity of the former 1,000-gallon disposal tank north of the building, in an area just west of the building, and in a small area under the building with limited quantities above cleanup objectives (FIGURE 12). There are approximately 200 cubic yards of contaminated subsurface soils that would need to be addressed in these areas identified by NYSDEC. Additional soil sampling will be conducted during the remedial design (RD) to refine this estimate. Contaminants that were found above NYSDEC Technical and Administrative Guidance Memorandum #4046 (TAGMs) for the protection of groundwater, include TCA at 4.6 parts per million (ppm) with a cleanup objective of 0.8 ppm, TCE at 0.73 ppm with a cleanup objective of 0.7 ppm, DCA at 1.3 ppm with a cleanup objective of 0.2 ppm, perchloroethylene (PCE) at 25 ppm with a cleanup objective of 1.4 ppm, ethyl benzene at 61 ppm with a cleanup objective of 5.5 ppm and xylene at 570 ppm with a cleanup objective of 1.2 ppm. The data from the NYSDEC test pit samples are shown on TABLE 6.

Based on EPA review of historical aerial photographs of the Site, in May 1999, EPA's Removal Program performed a geophysical survey and developed test pits which identified a paint and debris disposal area immediately north of the northwest corner of the building on the MRIP property. Samples from this area were found to contain elevated levels of ethylbenzene, xylenes, and other paint-related compounds (including toluene, isopropylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, lead and naphthalene). This work is detailed in an EPA Trip Report titled Exploratory Trenching at the Mohonk Road Industrial Site, dated June 28, 1999. TABLE 7 displays soil sampling data from this event that exceed soil cleanup objectives. The highest levels of contaminants were found in test pit samples of solidified paint waste (P-1), a mix of paint waste and soil (S-4), and soil from the trench sidewall (S-11). Contaminants found above cleanup objectives include 6,132 ppm total xylenes, and 1,243 ppm ethylbenzene in the paint waste sample; 827 ppm total xylenes and 174 ppm ethylbenzene in the sample of the soil/paint waste mixture; and 18 ppm total xylenes in the soil sample. Low levels of TCA (below the cleanup objectives) were found in soil from the trench sidewall (S-11) and the northern excavation trench (S-1); and low levels of TCE (below the cleanup objectives) were also found in S-11 and in the solidified paint waste sample (P-1). In the fall of 1999, EPA's Removal Program excavated a large portion of these contaminated soils (approximately 350 cubic yards). It is estimated that approximately 300 cubic yards of additional contaminated soil remains in the paint waste area which will require excavation. Additional soil sampling will also be conducted in this disposal area during the remedial design to further refine this estimate.

Ecology and Cultural Resources

Four freshwater wetlands regulated by NYSDEC (under Article 24 of the NYS Environmental Conservation Law) are present within a 2-mile radius of the MRIP property; however, none of the four are within 0.5 miles of the Site or are hydraulically connected to the Site.

A Federally-regulated wetland is present along Mohonk Road, approximately 50 feet southwest of the MRIP property. This wetland is designated as palustrine, scrub-shrub, broad-leafed deciduous, seasonally flooded/saturated on the U.S. Department of Interior Fish and Wildlife Service National Wetlands Inventory Map (Mohonk Lake quadrangle, draft). Other wetlands present in the area, associated with the flood plain of the Coxing Kill, are not associated with the proposed project area. Potential impacts and mitigation measures related to the construction of the NTCRA pipeline in this area were considered in the report entitled

Ecological Evaluation of the Proposed Effluent Discharge Pipeline Routing from the Mohonk Road Industrial Plant Site, Interim Report 1, which is part of the administrative record.

A Step 1 Analysis of the MRIP Site was conducted following the guidelines in Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (NYSDEC, October 1994) in order to identify wildlife resources. The studies included: a desktop analysis of available maps and information; contact with agencies and organizations to provide Site-specific resources; a field survey, and an assessment of applicable fish and wildlife regulatory criteria based on the sampling results. Numerous wildlife observations have been made. No threatened or endangered birds, mammals, reptiles, amphibians, fish, or invertebrates inhabit this area. A description of the Step 1 Analysis is available in the RI (Chapter 8). The study concluded that no further study of fish and wildlife resources was necessary at that time.

A Phase 1A Literature Review and Archeological Sensitivity Assessment was finalized in March 1999 by Hartgen Acheological Associates for NYSDEC. The assessment concluded that numerous historic and prehistoric resources existed near the Site, including the Delaware and Hudson Canal Locks (Locks 15 through 20 are part of the Delaware and Hudson Canal Thematic National Historic Landmark), the High Falls Historic District (which includes properties on Bruceville Road, Second Street, Firehouse Road, Mohonk Road, and NYS Route 213) and the Lock Tender's House and Canal Store Ruin. The assessment concluded that if water lines are installed within three feet of existing pavement or in other areas previously disturbed, it is likely that an archeological survey would not be necessary.

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USERS

The MRIP property is currently zoned for light industrial use. Discussions with the Town of Marbletown indicate it has no intent of modifying the zoning for the MRIP property. The most reasonably anticipated future use for the MRIP property is light industrial.

The Site is located in an area of chiefly residential development, where groundwater is the sole source of potable water. Most wells in the area currently draw water from the bedrock aquifer, which has been designated as Class GA groundwater by NYSDEC. Class GA groundwater is defined as follows: "The best use of Class GA waters is as a source of potable water supply. Class GA waters are fresh groundwaters found in the saturated zone of unconsolidated deposits and consolidated rock or bedrock." Groundwater near the Site will continue to be used as a supply of potable water under future use scenarios.

SUMMARY OF SITE RISKS

Based on the analytical results of the RI, a Human Health Exposure Assessment was conducted by the NYSDEC to provide a qualitative assessment of the health risks to humans under current and future land-use scenarios. A full baseline risk assessment is not required for sites in the NYS program. In order to comply with EPA Risk Assessment Guidance, EPA prepared an abridged baseline risk assessment based upon the results of the Human Health Exposure Assessment, and an analysis of residents within and adjacent to the area covered by nearfield plume, in order to estimate the risks associated with current and future Site conditions. The baseline risk assessment estimates what risks the Site poses if no action were taken, and the GAC systems were not in service. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of NYSDEC's Human Health Exposure Assessment and the baseline risk assessment for this Site.

Based on the results of the baseline risk assessment, EPA has determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to human health and the environment.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification* - identifies the contaminants of concern at the Site based on several factors such as toxicity, frequency of occurrence, and concentration. *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water by which humans are potentially exposed). *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The reasonable maximum exposure was evaluated.

Current Federal guidelines for acceptable exposures are an individual lifetime excess carcinogenic risk in the range of 10^{-4} to 10^{-6} (e.g., a one-in-ten-thousand to a one-in-one-million excess cancer risk) and a health Hazard Index (HI) (which reflects the likelihood for noncarcinogenic effects for a human receptor) equal to or less than 1.0. (A HI of greater than 1.0 indicates a potential for noncarcinogenic health effects.)

Hazard Identification

Contaminants of concern (COCs) were identified in the Human Health Exposure Assessment conducted in the RI (Chapter 7). Based on the RI data, COCs were identified based on the frequency of detection, range of detected concentrations, and relative toxicity of Site contaminants. The data from NYSDEC's residential well sampling, the RI monitoring well data (December 1997), the subsurface soil data collected by NYSDEC (October 1996), and the RI test pit soil sample data (June 1997) were used in the assessment. Based on this data, COCs were identified for groundwater on and off the MRIP property and for subsurface soils on the MRIP property. TCA, DCE, and TCE were identified as COCs for groundwater on or off the MRIP property. DCA was identified as another COC for groundwater off the MRIP property. 1,2 Dichloroethene (1,2 DCE), TCA, PCE, ethylbenzene, and xylenes were identified as COCs for subsurface soil on the MRIP property. TABLE 8 presents the COCs for each medium, the frequency of detection for each COC, and the exposure point concentration used in the risk assessment based on the reasonable maximum exposure (RME) to various current and hypothetical future populations on and around the MRIP property.

Exposure Assessment

The Human Health Exposure Assessment in the RI concluded that the primary routes of exposure and most significant exposure intakes under a current land use scenario are inhalation of VOCs from groundwater (via showering with contaminated groundwater) by residents off the MRIP property, followed by ingestion of groundwater by workers on the MRIP property and ingestion of groundwater by local residents (primarily children) off the MRIP property. It is important to note that the GAC filtration systems, while they are a interim measure and are not very reliable for long-term use, have eliminated these exposure pathways for the time being and ensure a current safe supply of water for those wells which are impacted.

Under future-use scenarios, inhalation (via showering for a hypothetical resident on the MRIP property) and ingestion of groundwater (for a worker on the MRIP property) contribute the most significant COC exposure routes, followed by ingestion and inhalation to residents off the MRIP property. A more detailed discussion of the Human Health Exposure Assessment can be found in Chapter 7 of the RI Report, and in the EPA Addendum to the DEC Exposure Assessment. Additionally, TABLE 9 identifies all exposure pathways, media, potential receptors, and the rationale used to select these pathways.

The baseline risk assessment conducted by EPA considered the following current use scenarios: adult workers on the MRIP property (incidental ingestion of soils, inhalation of fugative dust, and ingestion of drinking water), adult and child residents off the MRIP property (inhalation, ingestion, and dermal contact with groundwater used as drinking water). Future use scenarios included: adult and child residents off the MRIP property exposed to groundwater as drinking water (ingestion, inhalation, and dermal contact), workers on the MRIP property exposed to subsurface soils (incidental ingestion of soil and inhalation of fugative dust), and adult and child residents on the MRIP property exposed to groundwater as drinking water (this hypothetical scenario is not based on the most reasonably anticipated future use for the MRIP property; it was considered to evaluate potential risks if the property was rezoned, and to evaluate risks to residents adjacent to the MRIP property under the assumption that the contaminant concentrations on the MRIP property would migrate and likewise impact these residential developments.) Potential current and future risk was also evaluated based on the residences in the nearfield plume and adjacent properties using the UCHD residential well sampling data.

Toxicity Assessment

Groundwater COCs were identified as TCA, DCA, DCE and TCE. These substances belong to a class of compounds called chlorinated volatile hydrocarbons. As a class, chronic oral and inhalation exposure to these compounds have demonstrated toxicity to the liver, kidney and central/peripheral nervous system. Additionally, chronic inhalation exposure to ethylbenzene may result in adverse developmental effects. Concomitant short/long-term exposure to these compounds could result in additive negative effects. Additionally, some of the compounds (e.g., TCE, DCE) have been shown to be carcinogenic in animal bioassays, and are considered probable or possible human carcinogens by EPA. Because of their volatility when water-bourne, in addition to ingestion exposure routes, significant exposure can result from inhalation routes. For more information on the documented health effects of the COCs, see Section 7.5.1 of the RI.

Toxicity data for the baseline risk assessment were provided by the Integrated Risk Information System (IRIS) database, Health Effects Assessment Summary Tables (HEAST), and EPA's National Center for Environmental Assessment. This information is presented in TABLE 10 for noncarcinogenic toxicity data and TABLE 12 for carcinogenic toxicity data.

Risk Characterization

The baseline risk assessment estimates the human health risk which would result from the contamination at the Site if no remedial action were taken, and the currently operating GAC filters were not in use. A more detailed discussion of the baseline risk assessment can be found in an EPA Memorandum dated October 20, 1999.

For carcinogens, risks are generally expressed as the incremental probability of an individual's developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

Risk = CDI x SF

where: risk = a unitless probability (e.g., $2x10^{-5}$) of an individual's developing cancer
CDI = chronic daily intake averaged over 70 years (mg/kg-day)
SF = slope factor, expressed as $(mg/kg\text{-}day)^{-1}$.

These risks are probabilities that usually are expressed in scientific notation (e.g., $1x10^{-6}$). An excess lifetime cancer risk of $1x10^{-6}$ indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it represents the number of additional cancers that would be expected to be seen if a population is exposed to the contaminants in a manner consistent with the scenario defined in the exposure assessment. EPA's generally acceptable risk range for site-related exposures is 10^{-4} to 10^{-6}.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., life-time) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ < 1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic noncarcinogenic effects from that chemical are unlikely. The HI is generated by adding the HQs for all chemical(s) of concern that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI < 1 indicates that, based on the sum of all HQ's from different contaminants and exposure routes, toxic, noncarcinogenic effects from exposure to all contaminants are unlikely. An HI > 1 indicates that site-related exposures may present a risk to human health.

The HQ is calculated as follows:

Noncancer HQ = CDI/RfD

where:

CDI = Chronic daily intake averaged over the exposure duration
RfD = reference dose.

CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic, subchronic, or short-term).

Under current use scenarios, the carcinogenic risk for the adult worker on the MRIP property through ingestion of groundwater is 4.6×10^{-4}, which slightly exceeds EPA's acceptable level. The HI for workers on the MRIP property under current use scenarios is 1.3, which exceeds EPA's acceptable level for noncarcinogenic health effects. Estimated carcinogenic risk to adults off the MRIP property in the nearfield plume under current and future use scenarios is 6.4×10^{-4} for adults, which exceeds EPA's acceptable level for carcinogenic risk. Estimated carcinogenic risk to children off the MRIP property in the nearfield plume is 4.4×10^{-4} for children, which also slightly exceeds EPA's acceptable risk level. The HI for adults and children off the MRIP property in the nearfield plume under current and future use scenarios is 0.38 and 0.94, respectively, which are below EPA's acceptable level for noncarcinogenic health effects. Noncarcinogenic hazards and carcinogenic risks for all potentially exposed populations are shown in TABLES 11 and 13, respectively.

Basis for Action

The results of the baseline risk assessment indicate that the groundwater at the Site poses an unacceptable risk to human health. These calculations assume the currently operating GAC filters are not in use. Actual or threatened releases of hazardous substances from this Site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health or welfare.

Discussion of Uncertainties in Risk Assessment

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

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

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

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the contaminants of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the contaminants 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 baseline human health risk assessment provides upper-bound estimates of the risks to populations at and near the Site, and it is highly unlikely to underestimate actual risks related to the Site.

Specifically, several aspects of risk estimation contribute uncertainty to the projected risks. EPA recommends that an arithmetic average concentration of the data be used for evaluating long-term exposure and that, because of the uncertainty associated with estimating the true average concentration at a site, the 95% upper confidence limit (UCL) on the arithmetic average be used as the exposure point concentration. The 95% UCL provides reasonable confidence that the true average will not be underestimated.

Exposure point concentrations were calculated from residential, monitoring well and soil sample data sets to represent the RME to various current and hypothetical future populations on and around the MRIP property. Some of the residential well sampling locations used were biased, i.e., they were selected due to the presence of elevated levels of contamination (e.g., residents in the nearfield plume area). Therefore, the UCL values calculated on those data sets are a conservative estimate of the RME. Uncertainty associated with sample laboratory analysis and data evaluation is considered low as a result of quality assurance and data validation.

In addition to the calculation of exposure point concentrations, several site-specific assumptions regarding future land use scenarios, intake parameters, and exposure pathways are a part of the exposure assessment stage of a baseline risk assessment. Assumptions were based on site-specific conditions to the greatest degree possible, and default parameter values found in EPA risk assessment guidance documents were used in the absence of site-specific data. However, there remains some uncertainty in the prediction of future use scenarios and their associated intake parameters and exposure pathways. The exposure pathways selected for current scenarios were based on the site conceptual model and related RI and FS data. The uncertainty associated with the selected pathways for these scenarios is low because site conditions support the conceptual model.

Standard dose conversion factors, risk slope factors, and reference doses are used to estimate the carcinogenic and noncarcinogenic hazards associated with site contaminants. The risk estimators used in this assessment are generally accepted by the scientific community as representing reasonable projections of the hazards associated with exposure to the various chemicals of potential concern.

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 NYSDEC's Human Health Exposure Assessment (in Chapter 7 of the RI) and EPA's baseline human health risk assessment (EPA Memorandum, dated October 20, 1999).

Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures which may be presented by the Site. The Fish and Wildlife Impact Assessment included in the RI (Chapter 8) presents a more detailed discussion of the potential impacts from the Site to fish and wildlife resources. The RI impact assessment did not identify currently existing pathways for significant exposures to fish or wildlife to Site related contaminants, and an ecological risk assessment was not performed. The study concluded that no further study of fish and wildlife resources was necessary at that time.

An Ecological Impact Assessment was also performed as part of the NTCRA for the Coxing Kill discharge, which concluded that the NTCRA discharge would not have an adverse impact on the Coxing Kill ecosystem. For further information, consult Interim Report 2, Ecological Evaluation of the Proposed Effluent Discharge to the Coxing Kill Creek From the Mohonk Road Industrial Plant Site, which is part of the administrative record. Some of the alternatives considered for the Site would involve discharge of treated groundwater to the Rondout Creek and Coxing Kill in compliance with NYSDEC effluent limitations for these surface water bodies.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. The objectives for the MRIP Site are based on available information and standards, such as ARARs, NYSDEC's recommended soil cleanup objectives, Site-specific risk-based levels, and the most reasonably anticipated future land use for the MRIP property, i.e., commercial development. The RAOs which were developed for soil and groundwater are designed, in part, to mitigate the health threat posed by ingestion and inhalation (through showering) of groundwater and contact with soils.

The following remedial action objectives were established for the Site:

- Eliminate inhalation and ingestion of, and dermal contact with, contaminated groundwater associated with the Site that does not meet State or Federal drinking water standards.

- Restore the bedrock aquifer to its most beneficial use (i.e., as a source of potable water), and restore it as a natural resource.

- Prevent or minimize cross-media impacts from COCs in contaminated soil to the underlying groundwater, which will also eliminate potential future exposure to this soil. Site soil cleanup objectives for COCs would be based on NYSDEC's TAGM 4046 for groundwater protection.

- Eliminate further off-MRIP property contaminated bedrock groundwater migration.

Groundwater, drinking water and surface water standards identified for the Site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of NYS Sanitary Code, as well as Federal Safe Drinking Water Act, 40 CFR Part 141 et.seq., MCLs for drinking water. NYSDEC TAGM 4046 provides soil cleanup objectives for the protection of groundwater, background conditions and health-based exposure scenarios; after identifying soil COCs for the Site, the TAGMs were considered and selected as cleanup criteria for the COCs. The contaminant and media-specific cleanup levels are presented in TABLE 14. In developing the final soil cleanup numbers, consideration was given to risks posed by the contaminants under reasonably anticipated future uses of the Site, and consistency with the New York State TAGMs.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected remedy be protective of human health and the environment, be cost-effective, comply with other laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The Proposed Plan and FS evaluate, in detail, the alternate water supply, groundwater and soil alternatives for the MRIP Site. These alternatives are presented below.

The implementation time for each alternative reflects only the time required to construct or implement the remedy and not the time required to design the remedy, negotiate its performance by the parties responsible for the contamination, or procure contracts for design and construction.

Alternate Water Supply Alternatives

Alternatives were developed to provide a permanent, safe water supply for all the private well owners impacted or threatened by contamination from the Site.

Three alternatives were established for the alternate water supply (AWS).

AWS-1 No Further Action

Present Worth:	$ 0
Capital Cost:	$ 0
Annual Operation and Maintenance (O&M):	$ 0
Time to Implement:	0 years

The Superfund Program requires that the "No-Action" Alternative be considered as a baseline for comparison with the other alternatives. The No-Action Alternative includes no active remedial measures. Monitoring and maintenance of the 70 currently operational point-of-use (POU) GAC systems for private well owners would be discontinued after the current service contract for these filters expires on February 26, 2001; further maintenance of these systems would be the responsibility of the homeowner.

AWS-2 Installation and Maintenance of Additional GAC Filter Systems

Present Worth:	$5,749,000[1]
Capital Cost:	$406,000[1]
Annual O&M (30 year O&M period):	$348,000[2]
Time to Implement:	3 months

[1] The cost estimate of Alternative AWS-2 was increased from the FS and Proposed Plan to account for 18 additional properties which were added to the proposed water service area (PWSA) during the public comment period (capital costs were increased by $22,000 and annual O&M was increased by $27,000, yielding a net increase of $430,000 in present worth).

[2] This alternative assumes residents with GAC systems will be responsible for funding the O&M of the GAC filters, because EPA does not fund O&M expenses, and NYSDEC has indicated they would not fund O&M for this number of GAC filters. Therefore EPA and NYSDEC expenditures for this alternative would only be the $406,000 in capital costs.

Alternative AWS-2 includes installation of GAC systems for all of the private well owners in the proposed public water service area (PWSA) that are currently not on GAC filters (approximately 85 more systems). Continued monitoring and maintenance of the GAC systems would be the responsibility of the homeowners. The GAC filters are designed to provide water that meets State and Federal MCLs.

The PWSA is depicted in FIGURE 13 and includes all properties currently impacted by Site-related groundwater contamination or considered threatened by the Site-related groundwater contamination. For cost estimating purposes, this alternative assumes that all private wells within the PWSA would become impacted in the future and would require a GAC filter. The PWSA was designed to be protective of human health. The RI groundwater sampling data, the historical private well sampling data and the simulations from the groundwater flow model were used to determine the boundaries. The proposed PWSA is currently comprised of 192 lots in the Towns of Marbletown and Rosendale. Of these 192 lots, approximately 155 are currently developed for residential or commercial use and contain private wells.

This alternative includes institutional controls which may be employed to prevent future use of the bedrock aquifer in the impacted or threatened area.

AWS-3 Public Water Supply Using Catskill Aqueduct

Present Worth:	$ 9,510,000[1]
Capital Cost:	$ 8,342,000[1]
Annual O&M (30 year O&M period):	$ 76,000[2,3]
Time to Implement:	2 years

[1] The cost estimate of Alternative AWS-3 was revised from the FS and Proposed Plan to account for 18 additional properties which were added to the PWSA during the public comment period and to include costs for residential GAC monitoring for four years (capital costs were increased by $753,000).

[2] The proposed water district will be responsible for funding the O&M expenses of the drinking water treatment plant.

[3] The estimate for annual O&M expenses for Alternative AWS-3 was increased by $12,000 from the Proposed Plan and FS based on an estimate by the Towns' engineers, which accounts for New York City's water use fee, and some miscellaneous expenditures. This estimate is documented in the Town's draft Plan, Map & Report.

Alternative AWS-3 includes the use of the Catskill Aqueduct as a new potable water supply source (FIGURE 14) and the establishment of a water distribution system in the PWSA. The PWSA for AWS-3 is the same as described in AWS-2 (FIGURE 13). Pursuant to the Surface Water Treatment Rule (40 CFR Parts 141 and 142), raw water from the aqueduct would require treatment to remove conventional contaminants, such as particulates, color, taste, odor, and microbes. A conventional treatment scheme for a surface water supply, such as the aqueduct water, includes coagulation, flocculation, sedimentation, and filtration (FIGURE 15). After filtration, a final disinfectant (e.g., chlorine) would be added to inactivate bacteria and other microbes, and control algal growth. A similar treatment scheme is currently used by the Village of New Paltz to treat its water supply, a portion of which is also drawn from the Catskill Aqueduct. The exact treatment system used would be determined during remedial design, consistent with the Small System Compliance Technology List for the Surface Water Treatment Rule (EPA 815-R-97-002, EPA 815-R-98-001, EPA 815-R-98-002, EPA 815-R-98-003).

Utilization of the Catskill Aqueduct would require the establishment of a community water district in the Towns of Marbletown and Rosendale and a use agreement between the PWSA and the New York City Department of Environmental Protection (NYCDEP). A connection to the Rondout Dewatering Chamber on Canal Road would be made and a main and pump would be installed to transfer raw water from the Rondout Dewatering Chamber to the treatment plant. To develop conceptual design cost estimates, it was assumed that the treatment plant would be located on the MRIP property. The location of the plant would be finalized during the design of the system. A pump would be needed to transfer the treated water to a water storage tank. Waste sludge generated from the water treatment process would be transferred to a dewatering unit where the sludge would be thickened then disposed of off-Site. A distribution system must also be constructed to convey the treated water from the storage tank to the users in the PWSA (shown conceptually in FIGURE 16). The system would be designed to provide fire protection to comply with local requirements.

NYCDEP requires that public water systems using the aqueduct as a source have a backup supply of water available for a minimum five-day period for periods of time when the Catskill Aqueduct is temporarily out of service (1905 New York City Water Supply Act). The sources of backup supply being considered are bedrock supply wells, the NTCRA treatment plant, and the Rondout Creek. The selection of the actual backup supply would be determined during predesign activities. The raw water from the backup water supplies would require treatment. As a possible backup supply well, monitoring well MRMW-13B, located near the Rondout Dewatering Chamber, was found to have a high yield (approximately 100 to 150 gallons per minute (gpm)) and was not in the contaminated plume area. The costs provided for this alternative reflect the bedrock well as a backup supply. The Town of Marbletown has indicated an interest in using the treated groundwater from the extraction and treatment system from groundwater response Alternative GR-3 (discussed below), if that alternative is selected as the groundwater response remedy; this option would be considered during the remedial design. Using the Rondout Creek would involve construction of a pumping station at the pool created by the dam in High Falls and installation of a raw water transmission main from the Rondout Creek to the treatment plant.

This alternative includes continued operation of the NYSDEC interim remedial measure to monitor and maintain the individual GAC filtration systems currently in use until the new public water supply system is operational. This alternative also includes institutional controls which may be employed to prevent future use of the bedrock aquifer in the impacted or threatened area.

AWS-4 Public Water Supply Using A Well Field

Present Worth:	\$ 9,015,000[1]
Capital Cost:	\$ 7,662,000[1]
Annual O&M (30 year O&M period):	\$ 88,000[2]
Time to Implement:	2 years

[1] The cost estimate of Alternative AWS-4 was revised from the FS and Proposed Plan to account for 18 additional properties which were added to the PWSA during the public comment period (capital costs were increased by \$42,000, yielding a net increase of \$42,000 in present worth).

[2] The proposed water district will be responsible for funding the O&M expenses of the drinking water treatment plant.

Alternative AWS-4 includes the installation of a well field to service the PWSA on a full-time basis and the establishment of a water distribution system in the PWSA. The PWSA for AWS-4 is the same as described in AWS-2 (FIGURE 13); however, the PWSA boundaries may have to be expanded to include residences whose private wells may be impacted by drawdown associated with the actively pumping well field. The actual location of the well field would be determined during predesign and require the drilling of test wells, additional pump tests and groundwater modeling. In this alternative, it was assumed that two supply wells would be pumping simultaneously at approximately 20 to 25 gpm each to sustain the average water demand of 45 gpm required by the PWSA. A third well would be drilled as a backup.

Raw water from the supply wells would be pumped to a storage tank. It is assumed that treatment of the raw water would include chlorination at the very least and probably inorganic removal (needed because of the high metal content of the groundwater). Dosing equipment would maintain the necessary chlorine level to maintain disinfection. From the storage tank, water would be transferred to a distribution system, which would supply the PWSA. Waste sludge generated from the water treatment process would be transferred to a dewatering unit where the sludge would be thickened then disposed of off-Site. Access would need to be obtained to install and operate the well field and the distribution system. The system would be designed to provide fire protection to comply with local requirements.

This alternative also includes institutional controls which may be employed to prevent future use of the bedrock aquifer in the impacted or threatened area.

Groundwater Response Alternatives

Alternatives were also developed to comprehensively respond to the groundwater contaminant plume emanating from the MRIP property. As noted above, EPA is implementing a NTCRA to minimize the migration of the most contaminated groundwater in the nearfield plume.

Three alternatives were established for the groundwater response (GR).

GR-1 No Further Action

Present Worth:	$ 654,000
Capital Cost:	$ 131,000
Annual O&M (30 year O&M period):	$ 34,000
Time to Implement:	3 months

The Superfund Program requires that the "No-Action" Alternative be considered as a baseline for comparison with the other alternatives. The No-Action Alternative includes no active remedial measures. Alternative GR-1 is a no further action option that includes a long-term monitoring and evaluation program, presumed to be 30 years; the NTCRA extraction and treatment system on the MRIP property would only operate for the length of time authorized under removal authorities.

Alternative GR-1 also includes the installation of new groundwater monitoring wells and sampling of the monitoring wells as part of a long-term groundwater monitoring program. The Rondout Creek and Coxing Kill would also be sampled as part of the long-term monitoring program. This program would monitor and evaluate the fate and transport of the contaminant plume on an annual basis to determine whether the groundwater MCLs are satisfied. The groundwater monitoring program may be discontinued when contaminant levels in the plume are below MCLs for two consecutive years. This alternative assumes that the groundwater monitoring program would be the same regardless of the water supply alternative that is selected. The O&M cost for this alternative includes the monitoring program. Capital costs for this alternative covers monitoring well installation.

Modeling was not performed during the FS to estimate the time required to achieve MCLs under this alternative, though it is apparent that the time frame would be much greater than under Alternatives GR-2 and GR-3.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unrestricted use, CERCLA would require that the remedy be reviewed every five years.

GR-2 Continuation of Non-Time Critical Removal Action

Present Worth:	$3,482,000
Capital Cost:	$ 131,000
Annual O&M (30 year O&M period):	$ 218,000
Time to Implement:	3 months

Alternative GR-2 includes active treatment of the nearfield plume, specifically, operation of the NTCRA extraction and treatment system as a remedial action. The NTCRA system includes extraction of 40-45 gpm of contaminated groundwater from three recovery wells on the MRIP property, treatment with an air stripper, carbon polishing and inorganic treatment (using a Dynasand filter) of the effluent, vapor phase carbon treatment of air releases, and discharge of the treated effluent to the Coxing Kill. Effluent criteria would be based on State regulatory standards under the State Pollutant Discharge Elimination System (SPDES) program. NYSDEC has provided effluent criteria for discharge to the Coxing Kill, which are documented in EPA's June 4, 1999 Action Memorandum for the NTCRA (in Appendix E); the standards are generally in the range of 5 to 10 parts per billion for specific VOCs. A long-term groundwater and surface water monitoring program would be included in this alternative, similar to the one described under Alternative GR-1, to monitor the movement of contaminants and to assess the efficiency of the NTCRA recovery wells in removing the contaminants from the plume. Target cleanup levels in the near- and farfield plumes would be based on Federal and NYS MCLs. The O&M cost for this alternative includes the monitoring program and operation of the NTCRA treatment plant on the MRIP property. The treatment process will produce waste sludge, which will be thickened and disposed of periodically following analyses to determine the appropriate disposal option; for cost estimating purposes, it was assumed that the sludge would be disposed of off-Site as nonhazardous waste at a local landfill.

The groundwater modeling performed during the FS did not estimate the time required to achieve MCLs under this alternative; rather, the groundwater modeling estimated the time required for the untreated plume to reach the model boundaries. Preliminary estimates based on groundwater modeling indicate that it would take over a century to remediate the plume. For cost estimating purposes, it is assumed that the system would be operated for 30 years.

This alternative includes institutional controls which may be employed to prevent future use of the bedrock aquifer in the impacted or threatened area.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unrestricted use, CERCLA would require that the remedy be reviewed every five years.

GR-3 Extraction and Ex-Situ Treatment

Present Worth:	$ 6,043,000
Capital Cost:	$ 1,247,000
Annual O&M (30 year O&M period):	$ 312,000
Time to Implement:	2 years

Alternative GR-3 involves active remediation of contaminated groundwater by extraction and treatment Site-wide, i.e., operation of the NTCRA system as detailed in Alternative GR-2 to address the nearfield plume, and installation of a separate extraction and treatment system off the MRIP property. The system's design would be similar to the extraction and treatment system of the NTCRA. The alternative also has a long-term monitoring component.

Selection of a particular pumping pattern (i.e., placement of wells in and around the contaminant plume) depends on the identified depth and extent of contamination. The extraction wells would be designed to operate at an optimal rate to collect contaminated groundwater, contain the contaminant plume, and prevent the plume from migrating further downgradient. Because groundwater extraction at high pumping rates may cause depressed levels of groundwater in the bedrock aquifer and many of the existing private wells, this alternative must be paired with an AWS alternative that does not rely on a groundwater supply that is under the influence of the proposed extraction system as a water supply (i.e., Alternatives AWS-3 or AWS-4).

Contaminated groundwater would be pumped from the extraction wells to an air stripper to remove VOCs. Pretreatment of the groundwater would be necessary to remove conventional contaminants, such as iron and manganese, which may foul treatment plant equipment, and in order to meet surface water discharge limits. For cost estimating purposes, it was assumed that treated groundwater for the new groundwater treatment plant would be discharged to the Rondout Creek via a gravity discharge line, and that the NTCRA effluent would continue to be discharged to the Coxing Kill. Effluent criteria would be based on State regulatory standards under the SPDES program. NYSDEC has provided effluent criteria for the NTCRA discharge to the Coxing Kill, which are documented in

EPA's June 4, 1999 Action Memorandum for the NTCRA (in Appendix E); the standards are generally in the range of 5 to 10 parts per billion for specific VOCs; effluent criteria for the Rondout discharge would be obtained from NYSDEC. The treatment process will produce waste sludge, which will be thickened and disposed of periodically following analyses to determine the appropriate disposal option; for cost estimating purposes, it was assumed that the sludge would be disposed of off-Site as nonhazardous waste at a local landfill.

Target cleanup levels in the near- and farfield plumes would be based on Federal and NYS MCLs. The FS groundwater model was used to simulate this groundwater extraction and treatment option. For the purposes of conceptually identifying the number of wells, pumping rates, and well locations, these parameters were varied to determine which combination would effectively capture highly contaminated groundwater in the interior of the plume (within the 100 ppb contour as of the June 1998 sampling) while letting lower contamination levels on the periphery remediate through natural processes. After running several different cases with pumping rates between 25 and 50 gpm, it was determined that using three wells pumping the farfield plume at a rate of 40 gpm each produced drawdown averaging less than 10 ft in residential wells outside of the PWSA and effectively captured the contaminants released in the interior of the plume. Optimal pumping rates, well placement, and the number of extraction wells would be confirmed during the remedial design phase to ensure effective capture of the plume.

Active remediation would reduce the time frame for restoration of the bedrock groundwater. Steady-state simulations of the time necessary to achieve MCLs in the aquifer were conducted in the FS. Preliminary estimates based on groundwater modeling indicate that it would take on the order of several decades to remediate the plume. Additional modeling will be performed during the remedial design; a more refined estimate of the time required to remediate the aquifer will be prepared at that time. For cost estimating purposes, the it is assumed that the system would be operated for 30 years.

Long-term groundwater monitoring would be conducted during the active remediation phase to assess the effectiveness of the groundwater extraction and treatment system. No new monitoring wells are proposed under this alternative. Periodic evaluations of the groundwater monitoring data would be used to evaluate the continued operation of the pump and treat system. The monitoring program may be discontinued when contaminant levels are below ARARs for two consecutive years.

Soil Remediation Alternatives

Contaminated soils on the MRIP property are limited to the subsurface, i.e., greater than 2 ft below grade. The COCs in these soils were identified as TCA, 1,2-DCE, PCE, ethylbenzene, and xylenes, but additional groundwater COCs (DCE, TCE, and DCA) were also retained as soil COCs as the soil has the potential of leaching of the VOCs into the groundwater. Areas of the MRIP property containing contaminated soils include those labeled on FIGURE 12 as Areas 1A, 1B and 2B. Additional sampling for COCs would be conducted in Areas D-1 and D-2 to determine if additional soils need to be excavated. The disposal pit area characterized by EPA's Removal Program was found to contain elevated levels of soil COCs and paint-related compounds which had not been identified elsewhere on the Site.

Three alternatives have been established for source control (SC) to address contaminated soil.

SC-1 No Further Action

Present Worth:	$25,000
Capital Cost:	$25,000
Total Annual O&M:	$ 0
Time to Implement:	0 year

The Superfund Program requires that the "No-Action" Alternative be considered as a baseline for comparison with the other alternatives. The No-Action Alternative includes no active remedial measures. Alternative SC-1 does not include any excavation or treatment of contaminated soils on the MRIP property, but includes fencing to restrict access to the contaminated soils.

SC-2 Excavation and Ex-Situ Treatment Performed on the MRIP Property

Present Worth:	$ 624,000[1]
Capital Cost:	$ 330,000[1]
Total Annual O&M:	$ 158,000[1]
Time to Implement:	2 years

[1] The cost estimate for SC-2 differs from the Proposed Plan, because the Proposed Plan identified but did not quantify the approximately 300 cubic yards of additional contaminated soils in the paint waste area characterized by EPA's Removal Program (capital costs were increased by $153,000 and annual O&M was increased by $95,000, yielding a net increase of $330,000 in present worth).

Alternative SC-2 involves the excavation and ex-situ biological treatment of approximately 200 cubic yards of soil in the areas identified by NYSDEC with contaminants at levels that exceed the cleanup levels for COCs. These areas are indicated on FIGURE 12 as Areas 1A, 1B and 2B, however, additional sampling would be performed during the remedial design to further define the extent of contamination at the Site. The contaminated soils remaining in the paint disposal area characterized by EPA's Removal Program with COCs above cleanup levels would also be excavated for treatment. There are approximately 300 cubic yards of contaminated soils remaining in this area. Alternative SC-2 would also require a treatability study to determine the effectiveness of the enhanced biodegradation/aeration of Site soils. During the excavation, sampling would be conducted to ensure that contaminated soil is removed to satisfy the cleanup levels. Uncontaminated soil, particularly the surface soil, would be stockpiled on the MRIP property and used to backfill the excavation, along with uncontaminated backfill material transported to the MRIP property.

An area of the MRIP property would be designated to perform the soil remediation using enhanced biodegradation and aeration. Contaminated soil would be spread on a liner in a 12-inch thick layer. Soil nutrient levels would be measured and modified as necessary to promote optimal biodegradation. The soil would be aerated periodically to enhance volatilization of VOCs, and would be backfilled at the Site after the cleanup levels are achieved. Cleanup levels for soils would be based on NYS TAGMs for COCs to prevent cross media impacts to groundwater. For cost-estimating purposes, it is assumed that the treatment area would not be covered and that storm water runoff would not be collected. These assumptions would be reassessed in the remedial design phase. As storm water which contacts these soils could contain low levels of VOCs, it would be sampled to determine whether collection and treatment would be necessary prior to discharge.

The most suitable place to conduct the enhanced biodegradation and aeration process would be in an easily accessible area that is devoid of trees and structures. This area would be sloped slightly so that storm water could be easily collected, if necessary.

SC-3 Excavation and Off-Site Disposal

Present Worth:	$ 469,000[1]
Capital Cost:	$ 469,000[1]
Total Annual O&M:	$ 0
Time to Implement:	1 month

[1] The cost estimate for SC-3 differs from the FS, because the Proposed Plan identified but did not quantify the approximately 300 cubic yards of additional contaminated soils in the paint waste area characterized by EPA's Removal Program

(capital costs were increased by $216,000, yielding a net increase of $216,000 in present worth).

Alternative SC-3 involves the excavation and off-Site treatment (if necessary) and disposal of approximately 200 cubic yards of soil in the areas identified by NYSDEC with contaminants at levels that exceed the cleanup levels for COCs. These areas are indicated on FIGURE 12 as Areas 1A, 1B and 2B; however, additional sampling would be performed during the remedial design to further define the extent of soil contamination at the Site. The contaminated soils remaining in the paint waste area characterized by EPA's Removal Program with COCs above soil cleanup levels would also be excavated for off-Site treatment (if necessary) and disposal. There are approximately 300 cubic yards of contaminated soils remaining in this area. The excavation and sampling procedures for Alternative SC-3 would be similar to that of Alternative SC-2. Contaminated soil would be stockpiled or placed in rolloff containers on the MRIP property. Liners and/or covers may be necessary for the stockpiling of contaminated soil. Uncontaminated soil would be stockpiled and used as a portion of the backfill to the excavation.

Based on the analytical results of the RI, and field work by EPA's Removal Program, the contaminated soil would likely be classified as nonhazardous industrial waste. Additional sampling of the excavated soil would be required to characterize the soil. Once characterized for disposal, the soil would be transported off-Site to an appropriate, permitted, waste treatment or disposal facility, and transportation of the soil would be performed in accordance with Department of Transportation (DOT) regulations. For cost estimating purposes, it is assumed that the soils could be directly landfilled without treatment.

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria. These nine criteria are as follows: overall protection of human health and the environment; compliance with applicable or relevant and appropriate requirements; long-term effectiveness and permanence; reduction of toxicity, mobility, and volume through treatment; short-term effectiveness; implementability; cost; and State and community acceptance. The evaluation criteria are described below.

- <u>Overall protection of human health and the environment</u> 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.

- Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes and requirements, or provide grounds for invoking a waiver.

- 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. This criteria 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.

- 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.

- 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.

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

- Cost includes estimated capital and operation and maintenance (O&M) costs, and net present worth costs.

- State acceptance indicates whether the State concurs with, opposes, or has no comment on the preferred remedy.

- Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

Comparative Analysis of Alternate Water Supply and Groundwater Response Alternatives

The comparative analysis of the groundwater response and alternate water supply alternatives are being grouped together because both may impact the fate and transport of contaminants and hydrology in the SFBA; and, therefore, implementation of one response action would effect the implementability of the other.

Overall Protection of Human Health and the Environment

The no further action alternative for the potable water (Alternative AWS-1) would not be protective of human health in the currently impacted and threatened areas. Alternative AWS-2 would be more protective of human health than Alternative AWS-1, but the potential for human exposure remains if and when the GAC filters fail. The NYSDOH does not consider the use of POU GAC filtration units a long-term remedy, if a cost-effective, safe and reliable alternate water supply is available. It is generally the policy of both the NYSDEC and the EPA not to fund the long-term O&M of a large number of GAC filters as a long-term remedy, such as Alternative AWS-2. Alternatives AWS-3 (Catskill Aqueduct as primary supply) and AWS-4 (Well Field as primary supply) are the most protective alternate water supply alternatives. Alternatives AWS-3 and AWS-4 would be protective of human health through the supply of reliable, uncontaminated potable water.

Alternative GR-1 would not include any measures to prevent human contact with contaminated groundwater. Alternative GR-2 would extract and treat the nearfield portion of the groundwater and would rely on only institutional controls to prevent human contact with contaminated groundwater in the farfield portion of the plume. The farfield plume would continue to migrate and potentially impact additional wells. Of the three groundwater response alternatives, Alternative GR-3, which would extract and treat the contaminated groundwater in the near- and farfield plumes, is the most protective by preventing human contact with the plume, and by minimizing migration of the plume to other wells.

Compliance with ARARs

The most significant ARARs for potable groundwater are the Safe Drinking Water Act (42 U.S.C. §§ 300f et. seq.), National Primary Drinking Water Standards (40 CFR Part 141), and 6NYCRR Part 703 Groundwater Standards. For groundwater COCs, the NYS Class GA groundwater (fresh groundwaters whose best usage is a source of potable water) and NYS drinking water standard is 5 ppb. For a complete listing of ARARs, see FS Chapter 10, Table 10-1, and the EE/CA, Section 2.4.

The no further action alternative for the potable water (Alternative AWS-1) would not achieve compliance with ARARs for drinking water. Potable water Alternatives AWS-2, AWS-3 and AWS-4 are similarly effective in their ability to achieve applicable drinking water standards through either GAC treatment at individual wells or the installation of a public water supply. However, selection of Alternative AWS-2 would hinder Site-wide remediation because, in the absence of a public water supply system, groundwater extraction to address the farfield plume (Alternative GR-3) may depress the water table and have an adverse impact on local private wells. Therefore, selection of this alternative would hinder attempts to actively restore the aquifer. In addition, AWS-2 would only be protective and comply with ARARs if GAC filters were effectively maintained by homeowners over the long-term.

The no further action alternative for groundwater, GR-1, would not achieve compliance with NYS Class GA groundwater standards in either the currently impacted or threatened areas.

Construction of either potable water supply Alternatives AWS-3 or AWS-4 would comply with the National Historic Preservation Act (NHPA) (16 U.S.C. 470), Executive Order 11988 - Flood Plain Management, Executive Order 11990 - Protection of Wetlands and 40 CFR 6 Apx. A (Policy on Implementing Executive Order 11990), EPA's 1985 Statement of Policy on Floodplains/ Wetlands Assessments for CERCLA Actions, New York State wetlands protection under 6 NYCRR Part 662, and 6 NYCRR Part 601 for the development of a water distribution system. The pipeline installation as depicted conceptually in FIGURE 16 for Alternatives AWS-3 and AWS-4 would also comply with location-specific ARARs. Alternative AWS-3 would also comply with NYCDEP requirements for use of New York City's water supply system as a source of potable water.

Alternative GR-2 would achieve applicable groundwater standards in the nearfield plume through active groundwater extraction and treatment, but would not take active measures to achieve NYS Class GA groundwater standards in the farfield plume. Alternative GR-3 would be more effective than Alternative GR-2 in that it would achieve applicable groundwater standards throughout the near- and farfield plumes through active treatment and in a shorter time frame.

Residual VOC concentrations in the treated discharge from the active groundwater response Alternatives GR-2 and GR-3 would be at or below Federal and State standards (Clean Water Act, 33 U.S.C. §§ 1251-1387, and NYS Surface Water Standards, 6 NYCRR Parts 700-705).

Air emissions for the treatment system identified in Alternatives GR-2 and GR-3 would comply with the Clean Air Act (CAA, 42 U.S.C. §§ 7401 et. seq.), 6 NYCRR Part 2129 (air emissions) and NYS Air Guide - 1. The alternatives would also comply with the National Historic Preservation Act (NHPA), Executive Order 11988 - Flood Plain Management, Executive Order 11990 - Protection of Wetlands and 40 CFR 6 Apx. A (Policy on Implementing Executive Order 11990), EPA's 1985 Statement of Policy on Floodplains/Wetlands Assessments for CERCLA Actions, and New York State wetlands protection under 6 NYCRR Part 662.

Long-Term Effectiveness and Permanence

Alternative AWS-3 provides the greatest degree of permanence and long-term effectiveness, followed by Alternatives AWS-4, AWS-2, and AWS-1. Alternative AWS-1 does not provide long-term effectiveness or permanence. Alternative AWS-2 could be effective in providing a long-term source of potable water, but the potential for contaminant breakthrough exists in GAC systems; thus, GAC systems are not considered by EPA and NYSDEC to be a permanent remedy. In addition, maintaining a large number of individual POU GAC systems is less reliable, and would require more maintenance than an area-wide water treatment system, which would be used with Alternatives AWS-3 and AWS-4. Therefore, Alternatives AWS-3 and AWS-4 would be more effective than Alternatives AWS-1 or AWS-2 in providing a long-term, reliable source of potable water.

The water supply from Alternative AWS-4 is slightly less reliable than that of Alternative AWS-3, since under Alternative AWS-4 the wells could lose productivity during drought conditions. Based on groundwater model simulations, water supply wells pumping under Alternative AWS-4 in the proposed upgradient location would not draw contaminants upgradient, to any previously unaffected residential areas or into the supply wells. Also, based on model results, the impact of pumping the supply wells at 22.5 gpm each and NTCRA extraction wells at a total of 40 gpm on residential wells outside of the PWSA would be minimal except for two residential wells located relatively close to both the supply wells which the model predicted would exhibit a drawdown of about 16 ft. For Alternative AWS-4, it is important to note that without a detailed survey of well depths (and the depth of pumps in these wells), drawdowns such as those simulated, coupled with seasonal water level variations, may adversely affect some residential wells.

Alternative GR-1 would not be an effective or permanent remedial alternative in the long term. Also, the NTCRA extraction and treatment system would be shut down and would no longer be acting to minimize the migration of the nearfield plume at the conclusion of the removal action authorization. Alternative GR-2 would be more effective in reducing impacts to downgradient wells; however, contaminants in the farfield plume would not be actively addressed. Alternative GR-3 would be the most effective alternative to control and remediate the groundwater contaminant plume and reduce impacts to downgradient wells. The groundwater model results show that implementation of Alternative GR-3 should contain all contaminants above MCLs within the potential PWSA and that any wells outside the PWSA would not be impacted.

Reduction of Toxicity, Mobility, or Volume through Treatment

None of the alternate water supply alternatives directly addresses the mobility or volume of contaminants in the groundwater plume, although Alternative AWS-2 indirectly reduces the mobility of contaminants to a limited extent through localized pumping and treatment with the GAC systems. Alternative AWS-1 would not reduce the toxicity, mobility or volume of contaminants in the groundwater. Alternative AWS-2 would reduce toxicity by treating contaminated groundwater/drinking water with point-of-use GAC filtration. Alternatives AWS-3 and AWS-4 would eliminate the toxicity in residents' water supply by providing clean potable water to the currently impacted area and the threatened area.

Alternative GR-1 would not actively result in any reduction of toxicity, mobility, or volume of contamination present in the groundwater. Both Alternatives GR-2 and GR-3 would reduce these parameters in the nearfield plume, but GR-2 would not actively reduce these parameters in the farfield plume. Alternative GR-3 addresses this criterion most effectively as it would actively reduce these parameters throughout the near- and farfield groundwater contaminant plume.

Short-Term Effectiveness

Alternative AWS-1, no action, would not be effective in the short term for providing clean potable water. All of the remaining potable water supply alternatives would be effective in providing potable water in the short term to the consumers whose wells have GAC filtration systems currently installed. GAC treatment has proven to be effective to date. Periodic monitoring of private wells that could potentially be impacted by the contaminant plume (i.e., wells downgradient of the contaminant plume) has been instituted by UCHD and has been effective to date. Alternatives AWS-3 and AWS-4 would be effective in the short term as they incorporate the provision for installation and maintenance of GAC filters to impacted wells until a public water supply is provided. Implementation of these alternatives would take an estimated two years and cause noise and traffic impacts. However, these impacts can be minimized by employing appropriate construction techniques and practices.

Groundwater response Alternatives GR-1 and GR-2 would have minimal short-term impacts on human health and the environment as they would not require any significant construction. Alternative GR-3 would result in adverse impacts to local roads and would disrupt traffic. Additional potential impacts to the community include noise and dust generation due to the installation of piping and the construction of a groundwater treatment facility. However, these impacts would be minimized by employing appropriate construction techniques and practices.

Implementability

The no action alternative, AWS-1, is easily implemented. The installation of an additional 85 filtration systems can be readily implemented under Alternative AWS-2 as 70 existing GAC filtration systems have been installed and maintained successfully. However, maintaining this large a number of individual systems would require significant oversight, and also relies on individual property owners' willingness to have a system installed and maintained.

Alternatives AWS-3 and AWS-4 are both technically feasible. A water district must be formed in the PWSA for Alternatives AWS-3 and AWS-4 to be implementable. The Towns of Marbletown and Rosendale have prepared a draft intermunicipal agreement, as well as a draft Plan, Map & Report which describes the PWSA boundaries and per user cost estimates. The Towns held a public hearing on district formation on March 16, 2000, and the district is expected to form officially later this year. Alternatives AWS-3 and AWS-4 would require the construction of a water treatment plant, storage tower and a water distribution system and State and local approval of the design of the facilities. Construction efforts would need to be coordinated with the local utility companies. In addition, a water usage agreement would need to be reached between the PWSA water district and the NYCDEP for Alternative AWS-3.

Groundwater response Alternatives GR-1 and GR-2 would be easily implemented, as no additional construction is required. Institutional controls which may be employed to prevent future groundwater use for GR-2 would be established by the EPA and the NYSDEC. The NTCRA component of Alternative GR-2 would already be in place on the MRIP property, and would continue operating and require a part-time operator. For Alternative GR-3, the technologies for the installation of the extraction wells and treatment facility off the MRIP property are readily available, although they would take about two years to construct. Because groundwater extraction at high pumping rates may cause depressed levels of groundwater in the bedrock aquifer and many of the existing private wells, this alternative must be paired with an AWS alternative that does not rely on local groundwater as a water supply (i.e., a groundwater supply that is not under the influence of the proposed extraction system such as in Alternatives AWS-3 or AWS-4). Access to private property for construction of the treatment plant, and installation of piping and wells would need to be obtained. Public concerns regarding the placement of the facilities would also need to be addressed.

Cost

The capital costs, O&M costs, and present worth costs associated with each of the alternate water supply and groundwater response alternatives were estimated by NYSDEC for the FS and Proposed Plan. These cost estimates are presented below, with the noted revisions. Present worth costs were calculated over a 30-year period using 5 percent as the discount rate.

Alternate Water Supply Alternative	Capital Cost	Annual O&M	Present Worth
AWS-1	$0	$0	$0
AWS-2	$ 406,000[1]	$ 348,000[1,3]	$ 5,749,000[1]
AWS-3	$ 8,342,000[1]	$ 76,000[2,3]	$ 9,510,000[1,2]
AWS-4	$ 7,662,000[1]	$ 88,000[3]	$ 9,015,000[1]

[1] The cost estimates of Alternatives AWS-2, AWS-3, and AWS-4 were revised from the FS and Proposed Plan to account for the additional properties which were added to the PWSA during the public comment period. AWS-3 was also revised to include costs for residential GAC monitoring for four years.

[2] The estimate for annual O&M expenses for Alternative AWS-3 was increased by $12,000 from the Proposed Plan and FS based on an estimate by the Towns' engineers (draft Plan, Map & Report), which includes of additional expenses related to NYCDEP's water use fee, insurance, contracted labor, and benefits.

[3] As discussed in the alternative descriptions, the O&M expenses for all AWS alternatives are assumed to be the responsibility of the proposed water district or local residents.

Groundwater Response Alternative	Capital Cost	Annual O&M	Present Worth
GR-1	$ 131,000	$ 34,000	$ 654,000
GR-2	$ 131,000	$ 218,000	$ 3,482,000
GR-3	$ 1,247,000	$ 312,000	$ 6,043,000

As indicated above, Alternative AWS-1, no further action, is the least costly alternative while Alternative AWS-3 is the most costly. As presented above, the capital costs for Alternative AWS-3 is slightly higher than Alternative AWS-4, and both are considerably higher than Alternative AWS-2. The O&M of Alternative AWS-4 is somewhat higher than Alternative AWS-3 due to greater electrical usage.

As indicated above, Alternative GR-3 is the most costly alternative, followed by Alternatives GR-2 and GR-1.

State Acceptance

NYSDEC concurs with the selected remedy. A letter of concurrence is attached (APPENDIX IV).

Community Acceptance

Community acceptance of the proposed remedy for groundwater and alternate water supply were assessed during the public comment period. EPA believes that the community generally supports this approach. Specific responses to public comments are addressed in the Responsiveness Summary (APPENDIX V).

Comparative Analysis of Soil Remedial Alternatives

Overall Protection of Human Health and the Environment

The no further action alternative, SC-1, for the soils on the MRIP property would not provide protection of human health and the environment as the contaminants would remain in the environment, however access would be restricted by fencing. It is noted that surface soils (0 to 2 ft below grade) in Areas 1, 2, and D-2 do not contain COCs above cleanup goals and would act as a barrier to human contact with any contaminated soil in the subsurface. The concrete floor inside the building would act as a barrier to the contaminated soil in Area D-1. However, the contaminants in the subsurface soils in these areas, and in the paint waste disposal area, could leach into to groundwater.

Alternatives SC-2 and SC-3 would be equally protective of human health and the environment. Alternative SC-2 would remove the contaminants through excavation and treatment on the MRIP property. Alternative SC-3 would remove the contaminants through excavation and disposal at a permitted off-Site facility.

Compliance with ARARs

The no further action alternative, SC-1, for the contamination in the MRIP subsurface soils would not take any active measures to achieve the cleanup levels established for soil COCs (TCA, TCE, DCA, DCE, 1,2 DCE, PCE, ethylbenzene and xylenes); the specific cleanup levels for these COCs were taken from the NYS Recommended Soil Cleanup Objectives contained in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. Alternative SC-2 would achieve applicable soil cleanup objectives through excavation and on-Site treatment, and Alternative SC-3 would achieve soil cleanup objectives through excavation and shipment to an appropriate off-Site disposal facility. Although the current areas of excavation are outside floodplains, wetlands, and cultural resources, if additional areas are excavated or the existing areas are expanded, the alternatives would also need to comply with the National Historic Preservation Act (NHPA), Executive Order 11988 - Flood Plain Management, Executive Order 11990 - Protection of Wetlands and 40 CFR 6 Apx. A (Policy on Implementing Executive Order 11990), EPA's 1985 Statement of Policy on Floodplains/Wetlands Assessments for CERCLA Actions, and New York State wetland protections under 6 NYCRR Part 662. Disposal of contaminated soils under Alternative SC-3 would also comply with the Resource Conservation and Recovery Act (RCRA, 42 U.S.C. Section 6901 et. seq.), the NYS solid and hazardous waste regulations (6 NYCRR Parts 370-376), DOT transportation regulations, and CERCLA off-Site policy (if wastes are sent to a RCRA Subtitle C facility).

Long-Term Effectiveness and Permanence

Alternative SC-1 for contaminated soil on the MRIP property would not provide long-term effectiveness or permanence since contaminants would remain at the Site, and the contaminated soils could continue to impact groundwater. Alternatives SC-2 and SC-3 would be similarly effective in satisfying this criterion. Alternative SC-2 would permanently remove contaminants from Site subsurface soils through biodegradation; Alternative SC-3 would remove the contaminated subsurface soils and dispose of them off-Site.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative SC-1 for contaminated soil on the MRIP property would not reduce toxicity, mobility or volume of contamination present in the subsurface soils. Both Alternatives SC-2 and SC-3 reduce the mobility and volume of the VOCs through excavation. However, only Alternative SC-2 would reduce the toxicity of the subsurface soils through treatment. Based on existing RI data and data collected during the NTCRA field activities, it is not expected that the soils excavated under Alternative SC-3 would require treatment for disposal at an off-Site facility.

Short-Term Effectiveness

Alternative SC-1 for contaminated soil on the MRIP property would not result in short-term health or environmental impacts. Daily activities conducted by the current Site owner and tenants may be disrupted by the excavation and construction activities that would be required to implement Alternatives SC-2 and SC-3. However, these impacts can be minimized by employing appropriate construction techniques and practices.

Implementability

Subsurface contaminated soil remedial alternatives on the MRIP property are all implementable; however, Alternative SC-2 would require a treatability study to determine the effectiveness of the enhanced biodegradation/aeration of Site soils.

Cost

The capital costs, O&M costs, and present worth costs associated with each of the source control alternatives were estimated by NYSDEC for the FS and Proposed Plan. These cost estimates are presented below, with the noted revisions. Present worth costs were calculated over a 2-year period using 5 percent as the discount rate.

Source (Soil) Control Alternatives	Capital Cost	O&M (total)	Present Worth
SC-1	$ 25,000	$ 0	$ 25,000
SC-2	$ 330,000[1]	$ 158,000[1]	$ 624,000[1]
SC-3	$ 469,000[1]	$ 0	$ 469,000[1]

[1] The cost estimates for Alternatives SC-2 and SC-3 differ from those in the FS because the Proposed Plan identified but did not quantify the approximately 300 cubic yards of additional contaminated soils in the paint waste area characterized by EPA's Removal Program.

As indicated above, Alternative SC-1 is the least costly alternative, followed by Alternatives SC-3 and SC-2.

State Acceptance

As mentioned above, NYSDEC concurs with the selected remedy. A letter of concurrence is attached (APPENDIX IV).

Community Acceptance

Community acceptance of the proposed remedy for soil was assessed during the public comment period. EPA believes that the community generally supports this approach.. Specific responses to public comments are addressed in the Responsiveness Summary (APPENDIX V).

PRINCIPAL THREAT WASTES

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. Contaminated groundwater generally is not considered to be source material; accordingly, there are no source materials defined as principal threat wastes at the MRIP Site.

SELECTED REMEDY

Groundwater and Potable Water Supply

Based upon an evaluation of the various alternatives and consideration of community acceptance, EPA and NYSDEC have selected alternate potable water supply Alternative AWS-3: Public Water Supply Using Catskill Aqueduct, contaminated groundwater response Alternative GR-3: Extraction and Ex-Situ Treatment, and source control (contaminated soil) Alternative SC-3: Excavation and Off-Site Disposal as the selected remedy for the MRIP Superfund Site.

Summary of the Rationale for the Selected Remedy

The selected remedy will provide the best balance of trade-offs among alternatives with respect to the evaluating criteria, as described below.

Alternative AWS-3 is being selected because it eliminates inhalation, ingestion and dermal contact with contaminated groundwater associated with the Site that does not meet the State or Federal drinking water standards, and because it is considered to be the most reliable source of potable water over the long term. The potential for breakthrough exists with the GAC filtration systems (Alternative AWS-2). GAC filters are not considered a reliable long-term remedy, and it is more efficient to operate a central treatment plant rather than maintain an estimated 155 individual GAC units. In addition, selection of Alternative AWS-2 would hinder Site-wide remediation because, in the absence of a public water supply system, groundwater extraction to address the farfield plume (Alternative GR-3) may depress the water table and have an adverse impact on local private wells. The use of a well field as the primary source of potable water (AWS-4) is considered less desirable, since the wells may not be productive during drought conditions, and would be more susceptible to possible future contamination. Selection of Alternative AWS-3 to provide a permanent, alternative water supply is consistent with the recommendations made in the NYSDOH Health Consultation completed for the Site in December 1997.

Alternative GR-3 is the only alternative that will attempt to actively achieve applicable ARARs in the near- and farfield contaminant plumes. Alternative GR-1 would not actively reduce the toxicity, mobility or volume of contamination present in the groundwater. Alternative GR-2 would prevent human contact through institutional controls and extraction and treatment of contaminated groundwater in the nearfield plume, but would rely on natural processes to address the farfield plume. Alternative GR-3 will reduce the volume, mobility and toxicity of the contaminated groundwater both in the near- and farfield plumes in the shortest amount of time. Alternative GR-3 is expected to prevent the migration of the VOC contaminants in the groundwater to areas outside the proposed PWSA which might impact additional private water supply wells.

Alternative SC-3 is selected because it is cost-effective, will permanently mitigate the threat posed by Site soils, and will result in less disruption of MRIP property operations than Alternative SC-2. Unlike Alternative SC-1, which would take no active measures to achieve Site cleanup objectives, Alternative SC-3 will remove the sources of contamination in the subsurface soils on the MRIP property and achieve applicable soil cleanup objectives through excavation.

Description of Selected Remedy

The selected alternate water supply remedy, Alternative AWS-3: Public Water Supply Using Catskill Aqueduct, includes the construction and operation of a new public water supply system to provide safe potable water to the residences or businesses in the Towns of Marbletown and Rosendale with impacted or threatened private supply wells, with the Catskill Aqueduct as the water supply. FIGURE 14 shows the proposed major components of this alternative, and FIGURE 15 presents the proposed location of these components.

Raw water will be conveyed from the Catskill Aqueduct through the Rondout Dewatering Chamber to an elevated raw water storage tank on the MRIP property. The transmission line is assumed to be 6-inches in diameter, constructed of ductile iron, and installed in a trench approximately 4 to 5 feet below ground surface wherever possible. Approximately 2,400 feet of piping is assumed to be necessary for this stretch of pipe. The raw water storage tank will be constructed of steel and have a storage capacity of approximately 10,000 gallons. Raw water will flow via gravity to a treatment plant located adjacent to the storage tank. Treatment is assumed to consist of equalization, pH adjustment, coagulation, flocculation, clarification, filtration, and disinfection. The size of the treatment plant will be designed based on two times the average daily flow (approximately 126,100 gallons per day, or 88 gallons per minute). Pumps will be sized to transfer five times the average daily flow (220 gallons per minute).

Waste sludge will be generated from the water treatment process, namely in the sedimentation unit. Sludge will be transferred to a dewatering unit (e.g., a recessed plate filter press) where the sludge will be thickened to approximately 30% solids and the filtrate will be collected and disposed of off-Site.

Finished water will be pumped from the treatment plant to a nearby elevated storage tank. Based on the anticipated water demand of the PWSA, the tank will have at least a 150,000 gallon capacity. Approximately two acres of land will be needed at the MRIP Site for the water treatment plant with water storage components.

From the finished water storage tank, water will be gravity fed to the distribution system of the PWSA. The distribution system will consist of an 8-inch ductile iron primary main and 1-inch copper connection lines to buildings within the PWSA. Pipelines will be installed in a trench approximately 4 to 5 feet below ground surface under major roads wherever possible. The distribution system will consist of roughly 28,000 linear feet of installed primary main. There are a total of approximately 192 properties in the PWSA. 155 developed properties, and one property currently being developed, will be connected to the distribution system. FIGURE 16 depicts the conceptual layout for this system. The exact layout of the PWSA may be modified during the Remedial design based on additional sampling data, or groundwater modeling results, to include additional properties which are threatened or impacted by the contaminant plume or may be affected by water table drawdown from the groundwater extraction and treatment system (see Proposed Water District Formation discussion below).

For periods of time when the Catskill Aqueduct is temporarily out of service, a backup supply of water will be needed. Three options will be considered during the remedial design for the backup supply, namely: 1) the installation of a public supply well(s) (the preferred option), 2) the use of treated water from the groundwater extraction and treatment system, and 3) the use of the Rondout Creek.

Under option 1, well MRMW-13B could be converted to an extraction well or a new well would be located in the vicinity of well MRMW-13B. Well MRMW-13B would be considered for backup supply well because it was found to have a high yield, has not been impacted by the VOC plume, and residential wells in this area reportedly have artesian properties. Pump tests of well MRMW-13B and groundwater modeling would be conducted during the remedial design to determine the well's yield and assess the impact of pumping this well, or another well in this area, for extended periods on nearby potable wells. If pump tests or modeling indicates that nearby wells would be adversely impacted by water table drawdown from operation of the backup wells for an extended period of time, measures would be taken to mitigate these impacts (i.e., these residences would be considered eligible for inclusion in the PWSA, the potable wells could be drilled to a deeper depth, or another backup supply well would be installed farther away from these wells).

In order to use the treated water as a source of backup supply (option 2), it would need to be determined during the remedial design that this system could reliably produce sufficient yield to meet the demand. Although the NTCRA groundwater extraction and treatment system would be designed to comply with meeting NYSDEC surface water discharge standards, the treated groundwater would then need to be transported to the drinking water treatment plant for treatment to remove naturally occurring metals, such as iron and manganese (if necessary), disinfection and distribution.

Based on community opposition to option 3, and the fact that using the Rondout Creek as a backup supply is estimated to be about twice as costly as option 1, the Rondout Creek would not be pursued unless no other alternative for backup were available.

This alternative also includes continued operation of the NYSDEC interim remedial measure to monitor and maintain the individual GAC filtration systems currently in use until such a time that the new public water supply system is operational. If additional wells are impacted above MCLs in the interim, GAC filtration systems would be provided. Institutional controls may also be employed to prevent groundwater usage within the PWSA.

The elements of the selected groundwater response Alternative GR-3, Extraction and Ex-Situ Treatment, include the design and construction of a groundwater extraction and treatment system. A series of 3 to 6 new bedrock groundwater extraction wells, pumping at a total rate of approximately 120 gallons per minute, will be installed to gain hydraulic control over the farfield contaminant plume and to prevent the plume from migrating further downgradient. The exact location and number of these new extraction wells will be determined by conducting pump tests and groundwater modeling during the pre-design phase of the project.

The extracted groundwater will be treated with an air stripper in a new water treatment plant to remove VOCs from the groundwater. Treated water would be discharged to the Rondout Creek in compliance with effluent limitations for this surface water body. Conceptually, the location of the treatment plant would be near the Rondout Creek and north of Route 213. The exact location of the plant will be determined during the pre-design phase of the project. The cultural resources and the aesthetics of the neighborhood and availability of land will be important factors in the final location and design of the treatment plant.

The remedy also includes operation of the groundwater pumping wells and treatment system on the MRIP property, which are part of EPA's NTCRA to address the most contaminated portion of the groundwater plume. The NTCRA system includes extraction of 40-45 gpm of contaminated groundwater from three recovery wells on the MRIP property, treatment with an air stripper, carbon polishing and inorganic treatment (using a Dynasand filter) of the effluent, vapor phase carbon treatment of air releases, and discharge of the treated effluent to the Coxing Kill. The NTCRA system has been designed for 80 gpm capacity, which will allow and additional extraction wells to be connected to this system at a later date, if necessary.

A long-term groundwater monitoring program will be implemented that will assess the effectiveness of groundwater pumping and treatment on the contaminant levels in the aquifer over time. The need for additional monitoring wells would also be assessed during the remedial design. Surface water samples from the Rondout Creek and the Coxing Kill will be collected and analyzed as part of the long-term monitoring program to ensure compliance with discharge standards and to ascertain that the groundwater plume has not migrated into these water bodies.

Proposed Water District Formation

Implementation of the selected alternate water supply and groundwater response alternatives in this ROD is contingent on the formation of a local water district (the PWSA boundaries are depicted in FIGURE 13). The PWSA boundaries may be expanded during the remedial design if additional wells are found to be impacted or threatened by the VOC plume or water table drawdown from either the groundwater extraction and treatment system or backup supply wells. The Towns of Marbletown and Rosendale have been proceeding with the necessary steps to form a water district, and have recently prepared a draft intermunicipal agreement, a draft Plan, Map & Report (which defines the district boundaries and gives estimated costs for users of the district), and have held a public hearing on district formation. Details on the exact fee structure for district users is still being determined by the Towns. The district formation may be subject to local referendum. It is anticipated that the water district will require mandatory hook-ups for members of the district and closure of existing wells within the district. The cost for hookups and well closures is included in the capital cost projections for Alternative AWS-3 which will be funded by EPA and NYSDEC. In addition, prior to using the Catskill Aqueduct as a water supply, a water use agreement will need to be approved between the water district and the NYCDEP.

The source control supply remedy (for contaminated soils on the MRIP property), Alternative SC-3: Excavation and Off-Site Disposal, includes the excavation of soil containing contaminants at levels that exceed cleanup levels for soil COCs, and off-Site disposal and treatment (if necessary). The soil areas to be addressed which were identified in the RI are indicated on FIGURE 12 as Areas 1A, 1B and 2B. There are approximately 200 cubic yards of soil in these areas. Approximately 300 cubic yards of additional soil in the paint waste area characterized by EPA's Removal Program will also be addressed. Additional sampling will be performed during the design to further delineate COCs exceeding the cleanup levels. Soil from these areas will be excavated and stockpiled or placed in rolloff containers on the MRIP property. Once characterized for disposal, the soil will be transported off-Site to a permitted waste treatment or disposal facility. Uncontaminated soil will be stockpiled and used as a portion of the backfill for the excavation. Soil samples will be collected from the side walls and bottoms of the excavations to verify that cleanup levels are achieved. Once the completion of excavation is confirmed, the excavated areas will be backfilled with clean fill and restored.

Summary of Estimated Remedy Costs

The estimated present worth cost to implement the potable water supply portion of this remedy (AWS-3) is $9.5 million. The capital cost for the remedy is estimated to be $8.3 million and the estimated average annual O&M cost (which will be borne by the proposed water district) is $76,000 (TABLE 15).

The estimated present worth cost to implement the groundwater restoration portion of this remedy (GR-3) is $6 million. The cost to construct the remedy is estimated to be $1.2 million and the estimated average annual operation and maintenance cost for 30 years is $312,000 (TABLE 16).

The estimated present worth cost to implement the contaminated soils portion of this remedy (SC-3) is $469,000; there are no long-term O&M costs associated with this remedy (TABLE 17).

The total estimated present worth cost for the selected remedy alternatives is $16,022,000. This includes an estimated $1,168,000 in O&M for 30 years for operation of the drinking water treatment plant (which will be borne by the proposed water district). EPA and NYSDEC's share of the 30 year total present worth cost is $14,854,000.

The information in this cost estimate summary is based on the best available information regarding the anticipated scope of the remedial alternatives. These are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the components of this remedial alternative. Major changes may be documented in the form of a memorandum in the administrative record file, an Explanation of Significant Difference (ESD), or a ROD amendment.

Expected Outcomes of Selected Remedy

Implementation of alternate water supply Alternative AWS-3 will eliminate potential risks associated with exposure to contaminated groundwater on and off the MRIP property. Upon implementation, this remedy will provide safe potable water to the threatened and impacted residences and/or businesses within the PWSA. Design and construction of the system is expected to take approximately three to four years.

Based on preliminary estimates and the modeling performed by NYSDEC in the FS, it is estimated that implementation of groundwater response Alternative GR-3 will achieve Site cleanup objectives for groundwater in several decades through operation of a groundwater extraction and treatment system. By achieving cleanup levels, the groundwater will be available for its best use (as a source of potable water supply). Additional modeling will be performed during the remedial design; a more refined estimate of the time required to remediate the aquifer will be prepared at that time.

The cleanup levels, summarized in TABLE 14, are based on ARARs (i.e., EPA and NYS groundwater and drinking water standards). Design and construction of the system is expected to take approximately three to four years.

Implementation of source control Alternative SC-3 will eliminate potential cross-media impacts from the soil source areas. The cleanup levels for these soils, see TABLE 14, were based on NYS recommended levels to prevent groundwater impacts, and will allow the Site to continue to be used as a light industrial facility. Implementation of this alternative is expected to take approximately six months.

STATUTORY DETERMINATIONS

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete the selected remedial action for this Site must comply with applicable, or relevant and appropriate environmental standards established under Federal and State environmental laws unless a waiver from such standards is justified. The selected remedy also must be cost-effective and utilize permanent solutions and alternative treatment technologies or resource-recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances, as available. The following sections discuss how the selected remedy meets these statutory requirements.

EPA and NYSDEC believe that the selected remedy will be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions to the maximum extent practicable, as discussed below.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment. The selected alternate water supply remedy, Alternative AWS-3, is protective of human health and the environment because it will eliminate human exposure to water above NYS and Federal MCLs, by providing an alternate water supply. The selected groundwater response remedy, Alternative GR-3, will minimize the migration of the groundwater plume and achieve cleanup levels for the best available use of the aquifer, as a potable water supply. The long-term monitoring of the groundwater in the vicinity of the Site will assess the rate of recovery of the SFBA. The selected soil remedy, Alternative SC-3, will address soils to prevent cross-media impacts to groundwater. Implementation of the selected remedy will not pose unacceptable short-term risks, and no adverse cross-media impacts are expected.

Compliance with ARARs

The NCP (§§300.430(f)(5)(ii)(B) and (C)) requires that the selected remedy attain Federal and State ARARs. The remedy will comply with the following action-, chemical- and location-specific ARARs identified for the Site and will be demonstrated through monitoring, as appropriate. For a complete listing of ARARs, see FS Chapter 10, Table 10-1, and the EE/CA, Section 2.4.

Action-Specific ARARs:

40 CFR Part 61 - National Emissions Standards for Hazardous Air Pollutants
42 U.S.C. §§ 7401 et. seq., Clean Air Act
40 CFR Part 254.25 - Excavation and Fugitive Dust Emissions
42 U.S.C. Section 6901 et seq., 40 CFR Parts 260-268 - Resource Conservation and Recovery Act (RCRA) Standards for Handling, Transportation and Disposal of Hazardous Waste, including Land Disposal Restrictions
CERCLA off-Site policy (NCP §300.440)
6 NYCRR Part 200.6 - Ambient Air Quality Standards
6 NYCRR Parts 370-376 - New York State Standards for Handling, Transportation and Disposal of Hazardous Waste
DOT transportation regulations
Small System Compliance Technology List for the Surface Water Treatment Rule (EPA 815-R-97-002), Small System Compliance Technology List for the Surface Water Treatment Rule and Total Coliform Rule (EPA 815-R-98-001), Small System Compliance Technology List for the Non-Microbial Contaminants Regulated Before 1996 (EPA 815-R-98-002), and Variance Technology Findings for Contaminants Regulated Before 1996 (EPA 815-R-98-003)

Chemical-Specific ARARs:

40 CFR Part 141 - Federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs)
42 U.S.C. §§ 300F et. seq., Safe Drinking Water Act
6 NYCRR Parts 700-705, NYS Surface Water Standards

6 NYCRR Part 703, Groundwater Standards for Class GA groundwater
33 U.S.C. §§ 1251-1387, Clean Water Act
10 NYCRR Part 5 - New York State Sanitary Code for Drinking Water

Location-Specific ARARs:

National Historic Preservation Act (NHPA)
Executive Order 11988 - Flood Plain Management
Executive Order 11990 - Protection of Wetlands
40 CFR 6 Apx. A (Policy on Implementing Executive Order 11990)
EPA's 1985 Statement of Policy on Floodplains/Wetlands Assessments for CERCLA Actions
6 NYCRR Part 662, New York State wetland protection provisions

To-Be-Considered:

NYSDEC TAGMs 4046 - Hazardous Materials Soil Cleanup Levels
Air Guide I - NYSDEC Control of Toxic Ambient Air Contaminants
NYC 1905 Water Supply Act
Local Law Filing, New York State Department of State, re: Town of Marbletown, Local Law no. 3, a local law to mandate necessary fire flows in new water districts

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP §§300.430(f)(1)(i)(B)). 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 to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost-effective (NCP §§300.430(f)(1)(ii)(D)).

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital costs and O&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual costs were calculated for 30 years (estimated life of an alternative) using a five percent discount rate (consistent with the NYSDEC FS and Proposed Plan). For a detailed breakdown of costs associated with the selected remedy, please see TABLES 15-17.

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

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized. The selected remedy utilizes permanent solutions to address the groundwater contamination, provision of a drinking water supply, and soil contamination problems at the Site. The selected remedy represents the most appropriate solution at the Site because it provides the best balance of trade-offs among the alternatives with respect to the evaluation criteria.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied through the use of treatment measures to reduce the volume and mobility of contaminated groundwater in the aquifer.

Five-Year Review Requirements

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but will take more than five years to attain remedial action objectives and cleanup levels in the groundwater, a policy review may be conducted no less often than each five years after completion of the construction of the remedial action components for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

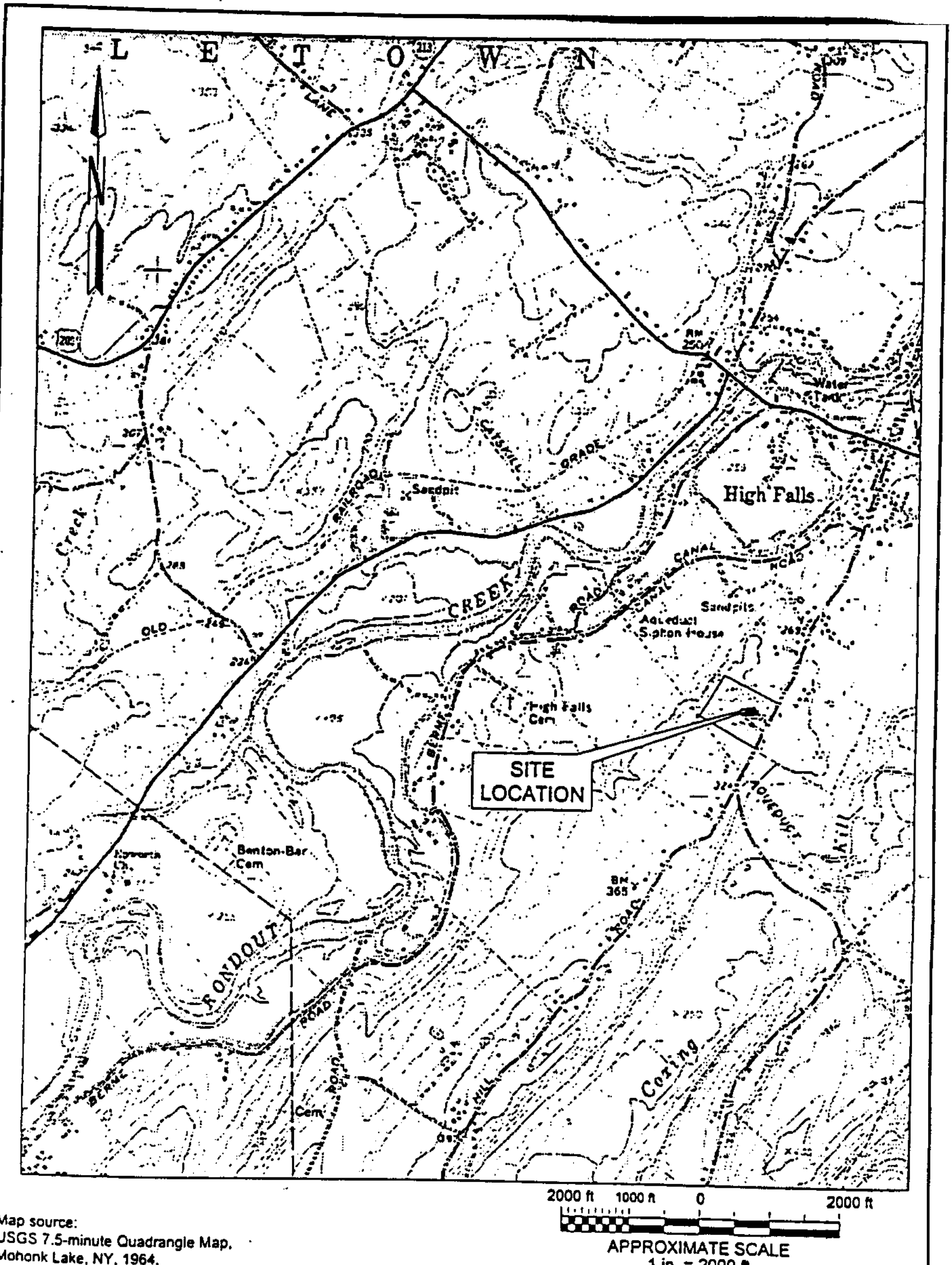
There were no significant changes from the preferred remedy presented in the Proposed Plan. It should be noted however, that the cost of the selected remedy has increased from about $13,885,000 to about $14,854,000 from the cost presented in the Proposed Plan. This is due to 1) the inclusion of additional properties to the proposed water service area since the Proposed Plan was released; 2) including costs for maintaining the GAC systems and monitoring private well water quality until the public water supply system is operational which were inadvertently omitted from the original estimate, and 3) an increase in the volume of soil requiring excavation.

In addition, at the request of the Town of Marbletown, the use of treated groundwater from the groundwater extraction and treatment system as a backup water supply will be considered during the remedial design.

Alternative AWS-3 was revised to include institutional controls which may be employed to prevent future use of the bedrock aquifer in the impacted or threatened area.

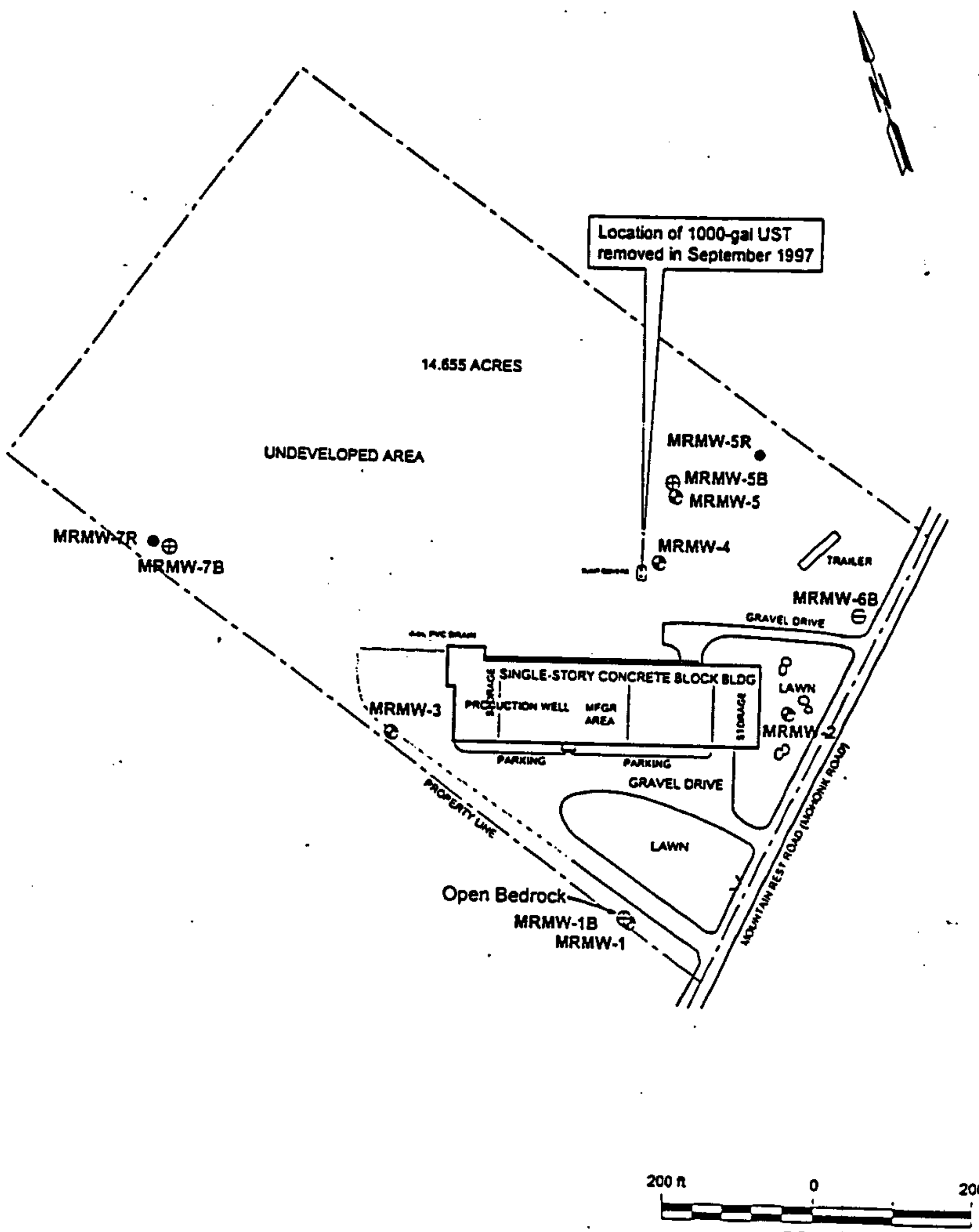
APPENDIX I

FIGURES



Map source:
USGS 7.5-minute Quadrangle Map,
Mohonk Lake, NY, 1964.

Lawler, Matusky & Skelly Engineers LLP One Blue Hill Plaza • Pearl River, New York 10965 ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS	Site Location Mohonk Road Industrial Plant NYSDEC I.D. No. 356023	Figure 1



Legend

- ⊖ Bedrock wells
- Interface wells
- ○ Existing production wells
- ● Recovery wells

Map source: Richard T. Sherman, P.C., 1981.

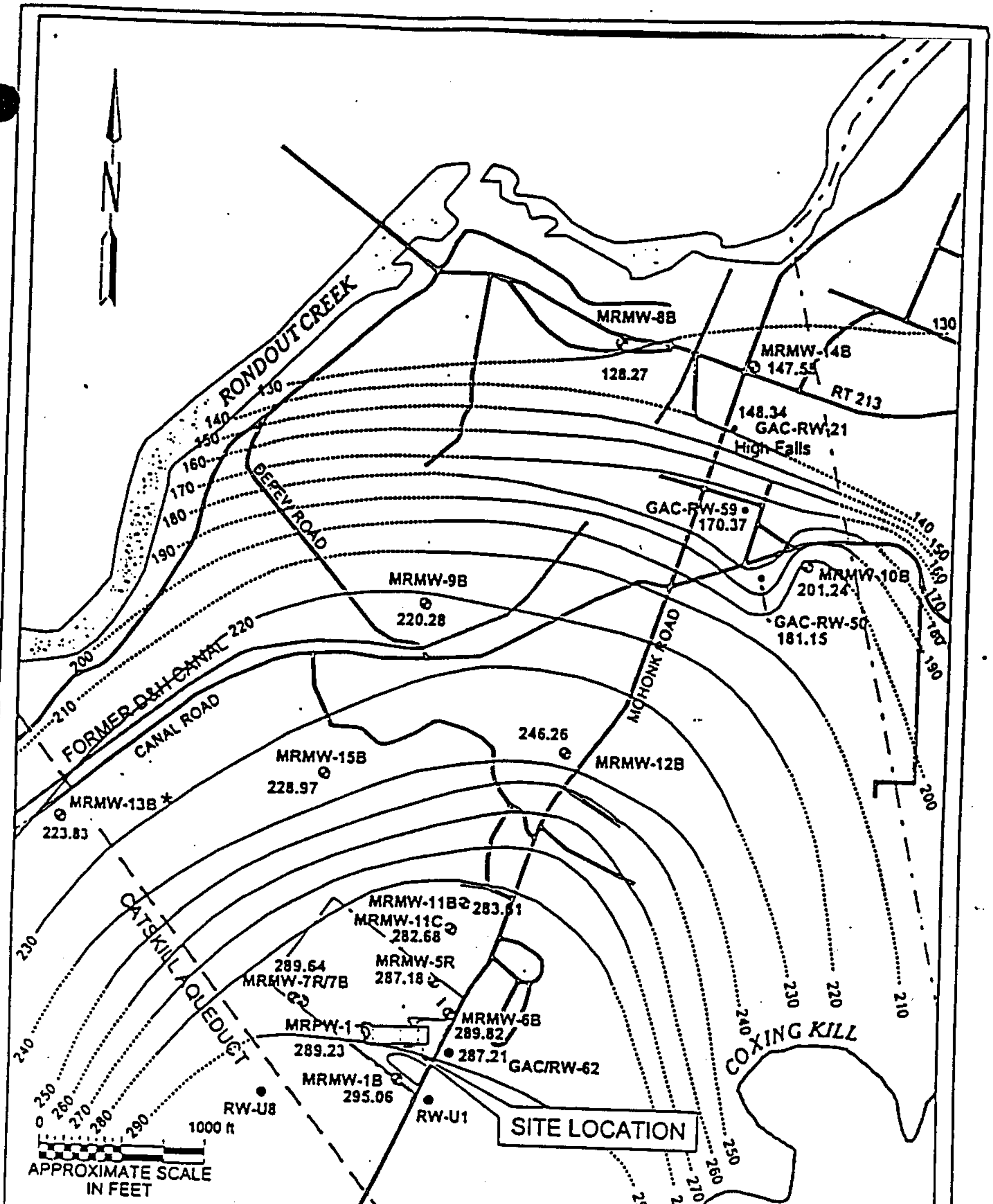
1650\MOHONK\MOHONKSITE.dsf

FIGURE 2

Site Plan

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York



LEGEND

MRMW-1 ⊘ Monitoring well (number indicates groundwater elevation relative to MSL)

● Residential well

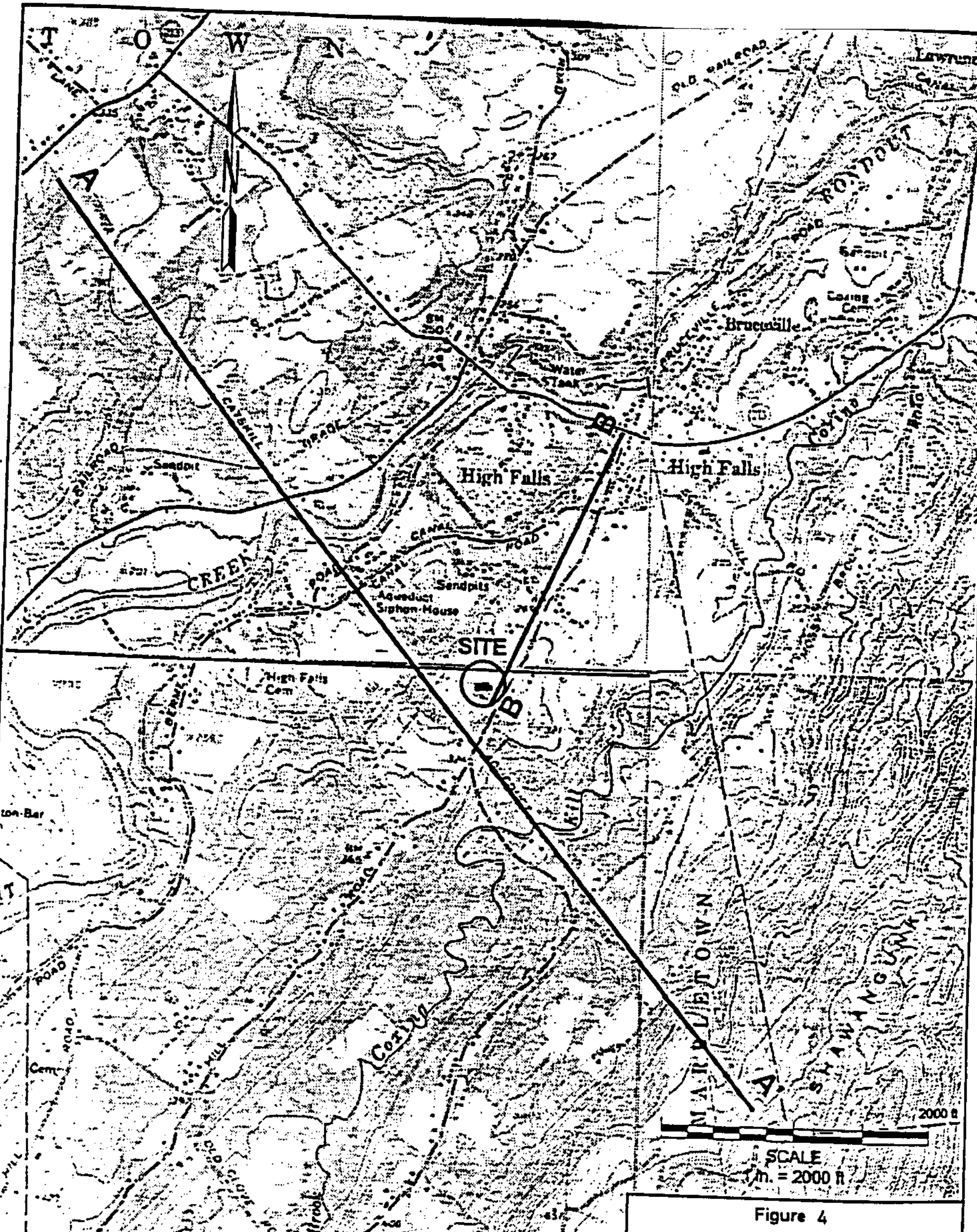
• Production well

Groundwater elevation contours (MSL) (dashed where inferred)

★ Indicates artesian well

M5025ILOCAT.dw4

LMS Lawler, Matusky & Skelly Engineers LLP One Blue Hill Plaza • Pearl River, New York 10965 ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS	Bedrock Groundwater Contour May 1998 Mohonk Road Industrial Plant NYSDEC I.D. No. 356023	Figure 3



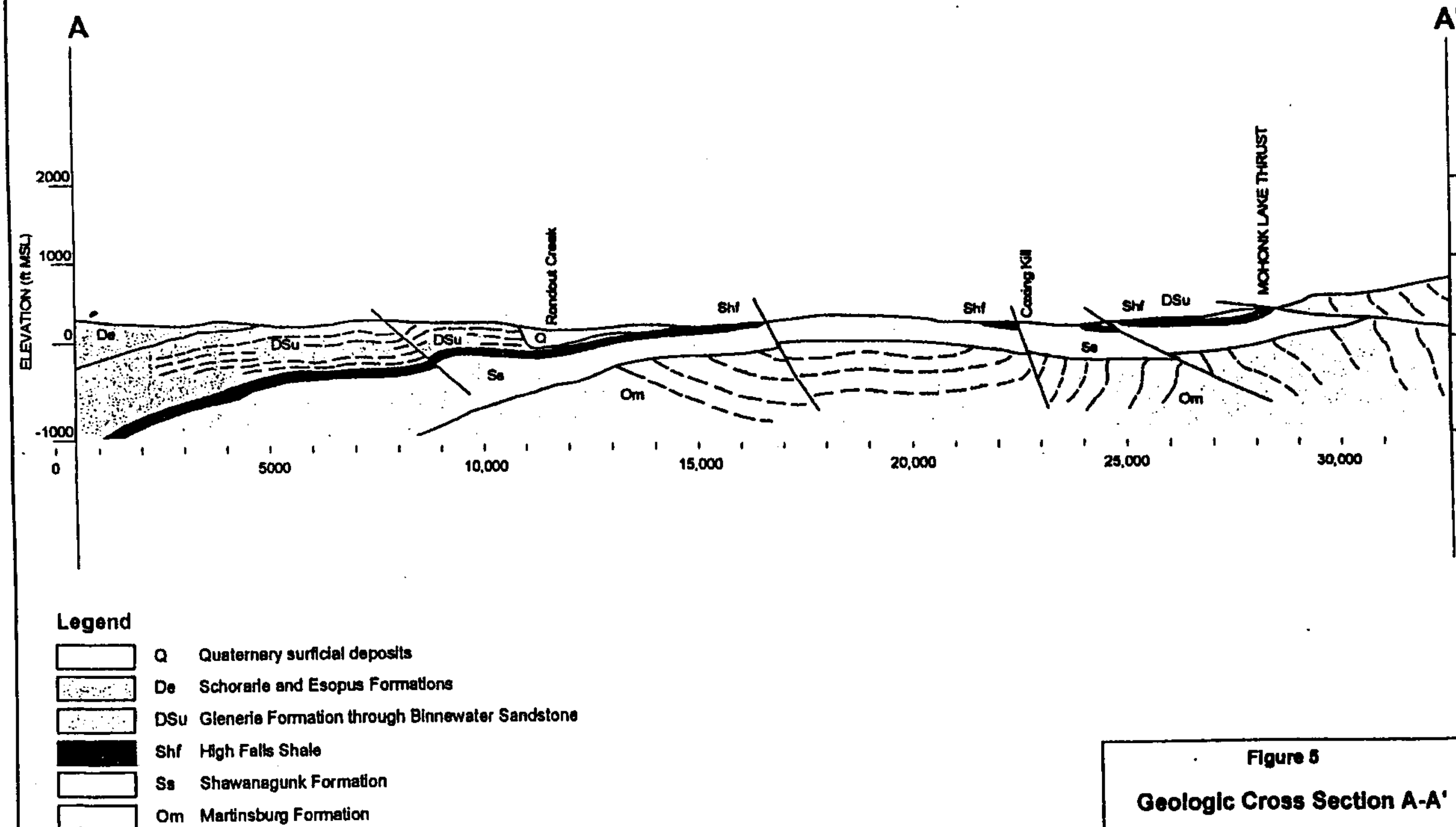
Map source:
USGS 7.5-minute Quadrangle Map,
Mohonk Lake, NY, 1964.
Rosendale, NY, 1964, photorevised 1980.

Figure 4

Geologic Cross Section Locations

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York



Source: Epstein and Little *in* Waines 1987.

\GEOXSECT.dsf

Figure 5

Geologic Cross Section A-A'

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

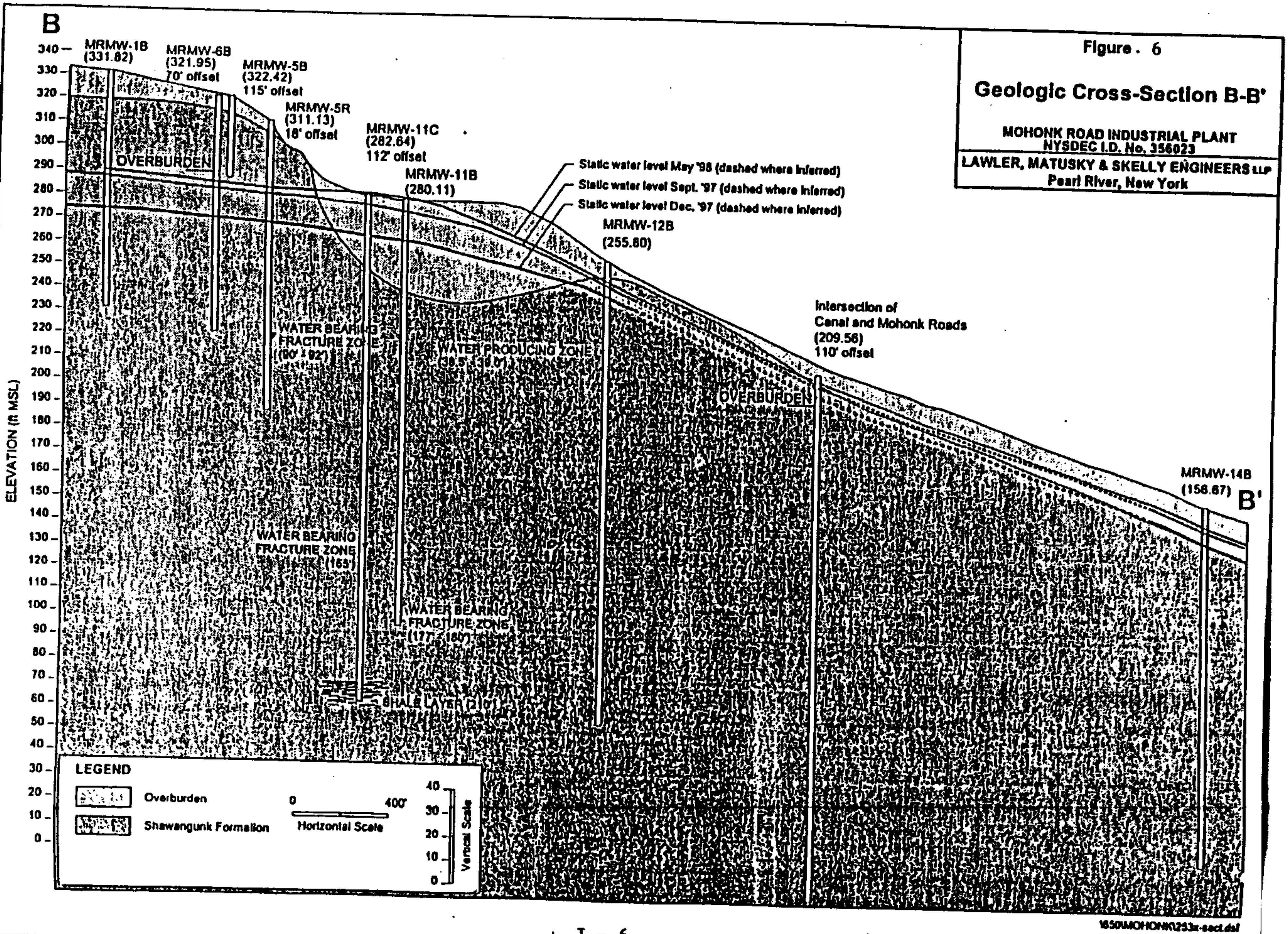
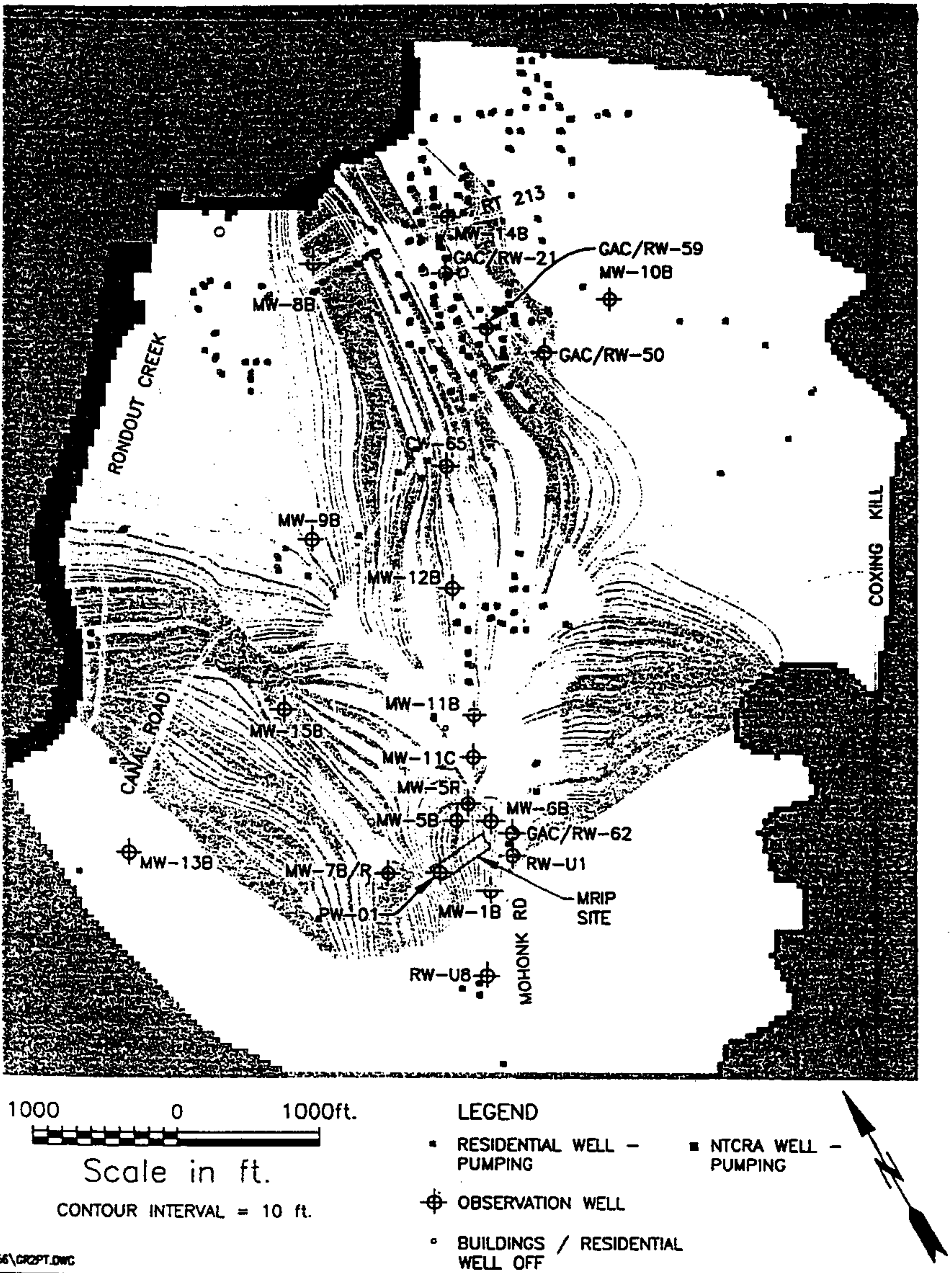


Figure . 6

Geologic Cross-Section B-B'

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

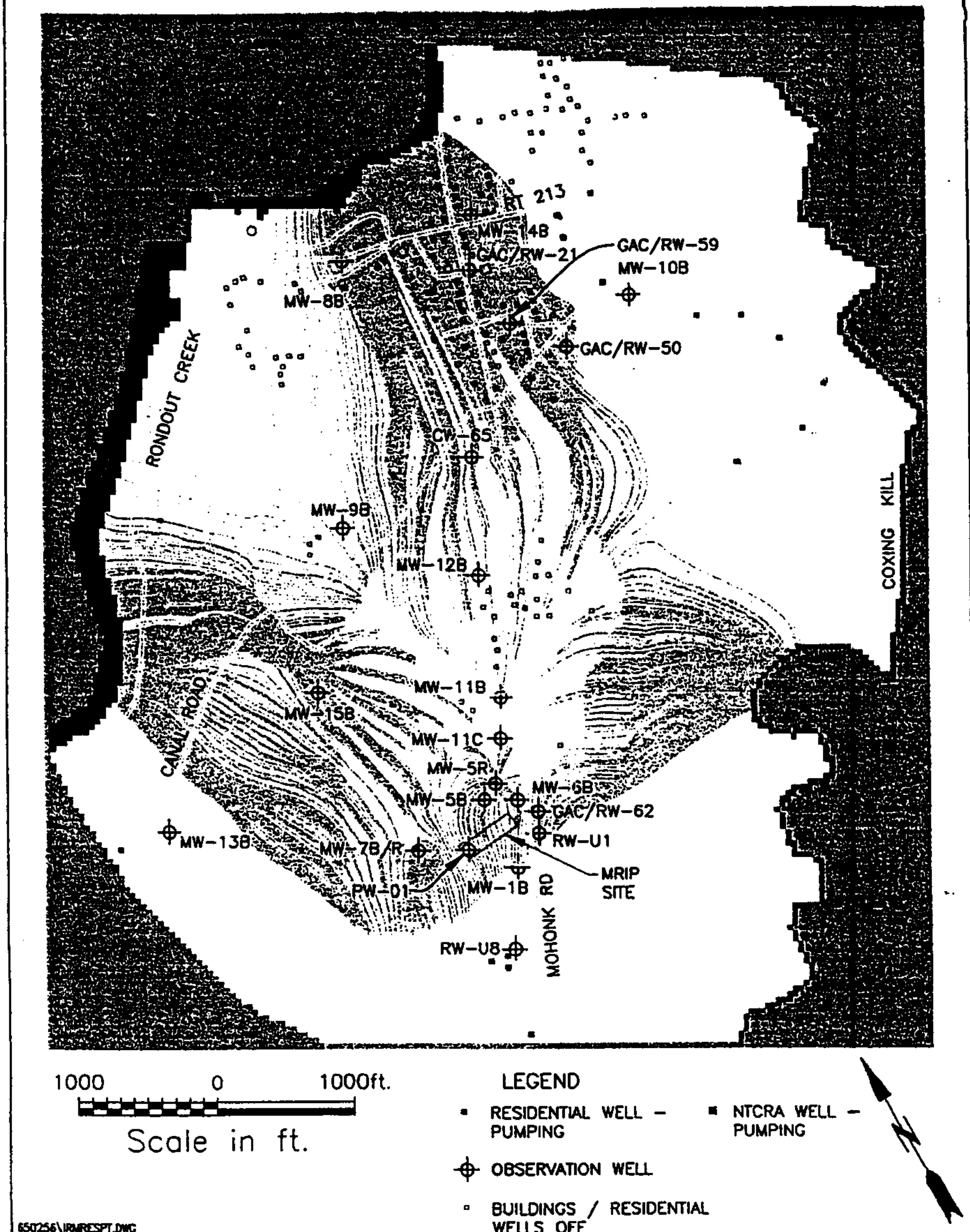


650256\GR2PT.DWG

LMS Lawler, Matusky & Skelly Engineers LLP
One Blue Hill Plaza Pearl River, New York 10965
ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS

MOHONK ROAD INDUSTRIAL PLANT SITE
GR-2 PARTICLE TRACKING WITH
RESIDENTIAL WELLS IN PWSA ON

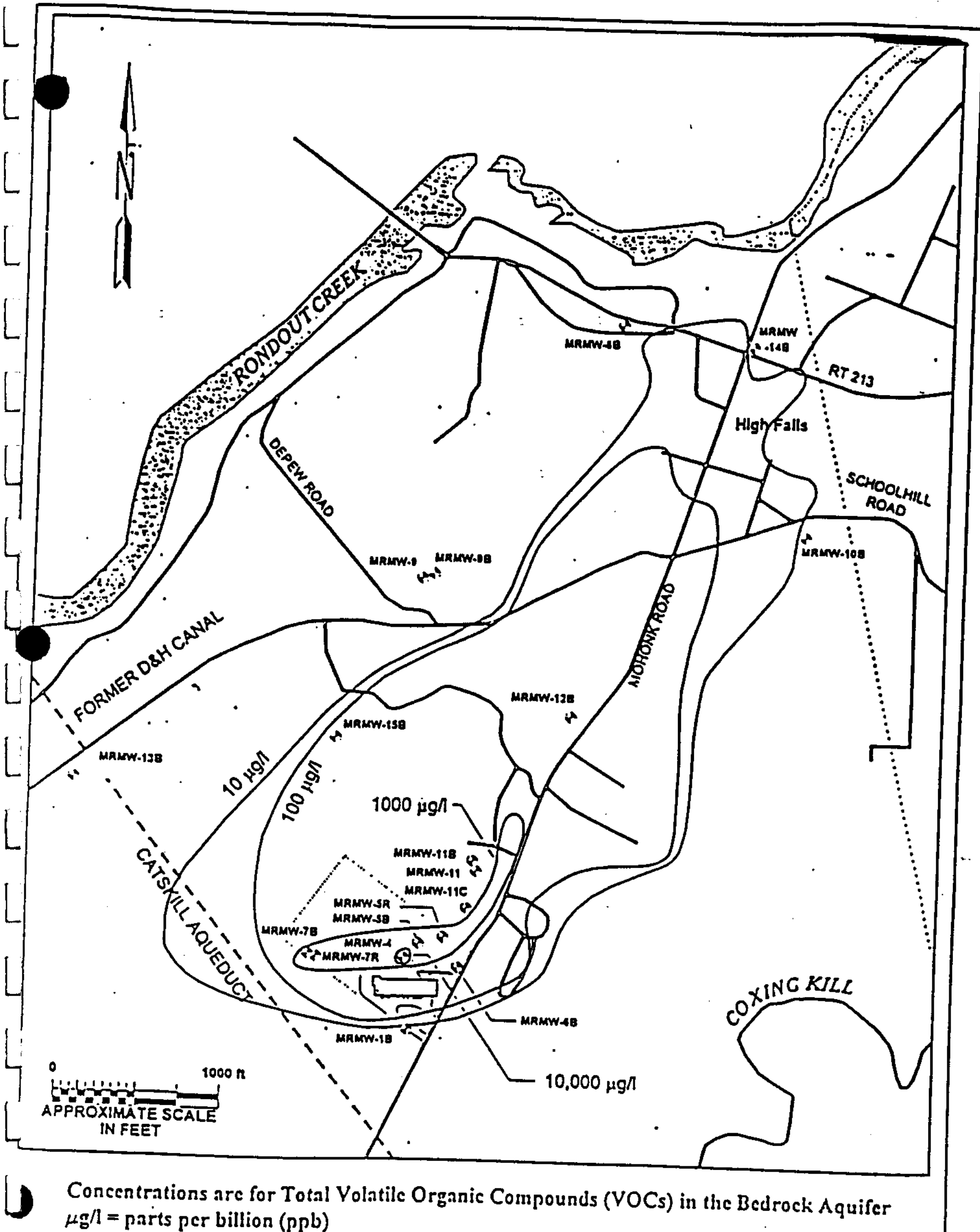
Figure 7



LMS Lawler, Matusky & Skelly Engineers LLP
One Blue Hill Plaza Pearl River, New York 10965
ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS

MOHONK ROAD INDUSTRIAL PLANT SITE
GR-2 PARTICLE TRACKING WITH
RESIDENTIAL WELLS IN PSWA OFF

Figure 8



Concentrations are for Total Volatile Organic Compounds (VOCs) in the Bedrock Aquifer
µg/l = parts per billion (ppb)

LMS Lawler, Matusky & Skelly Engineers LLP One Blue Hill Plaza • Pearl River, New York 10965 ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS	Approximate Groundwater Plume Based on May and June 1998 Groundwater Sampling Results Mohonk Road Industrial Plant NYSDEC I.D. No. 356023	Figure 9

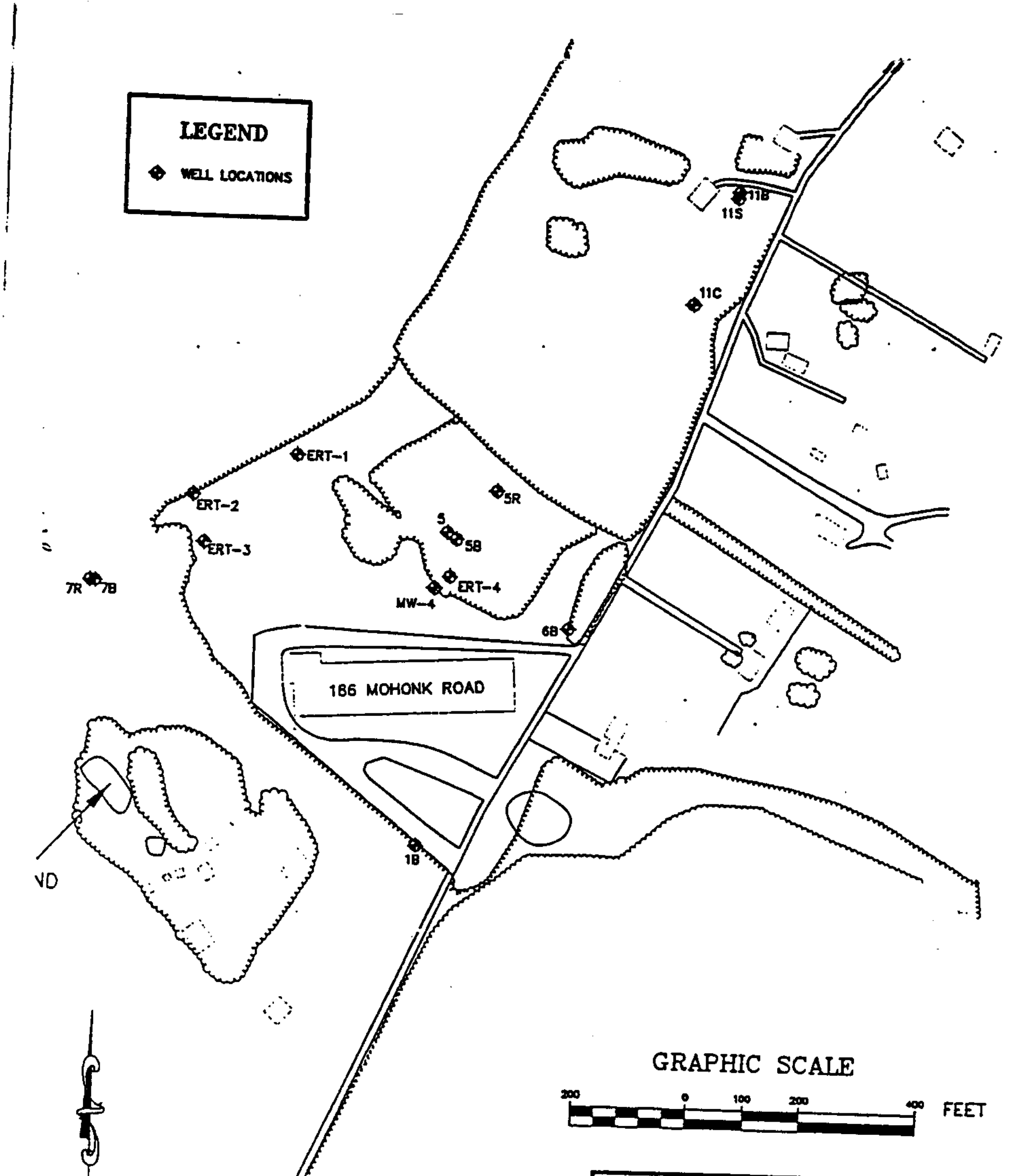
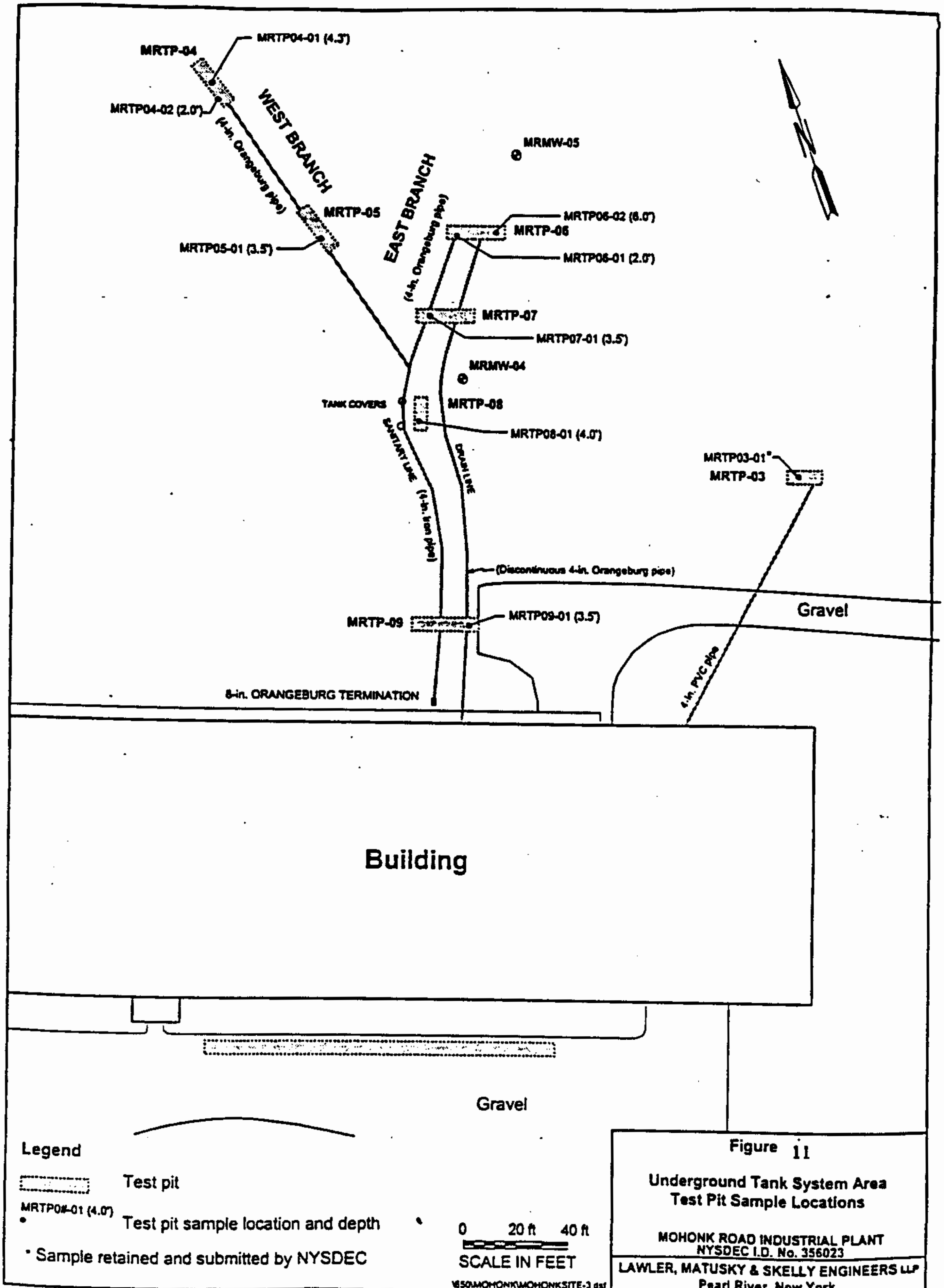


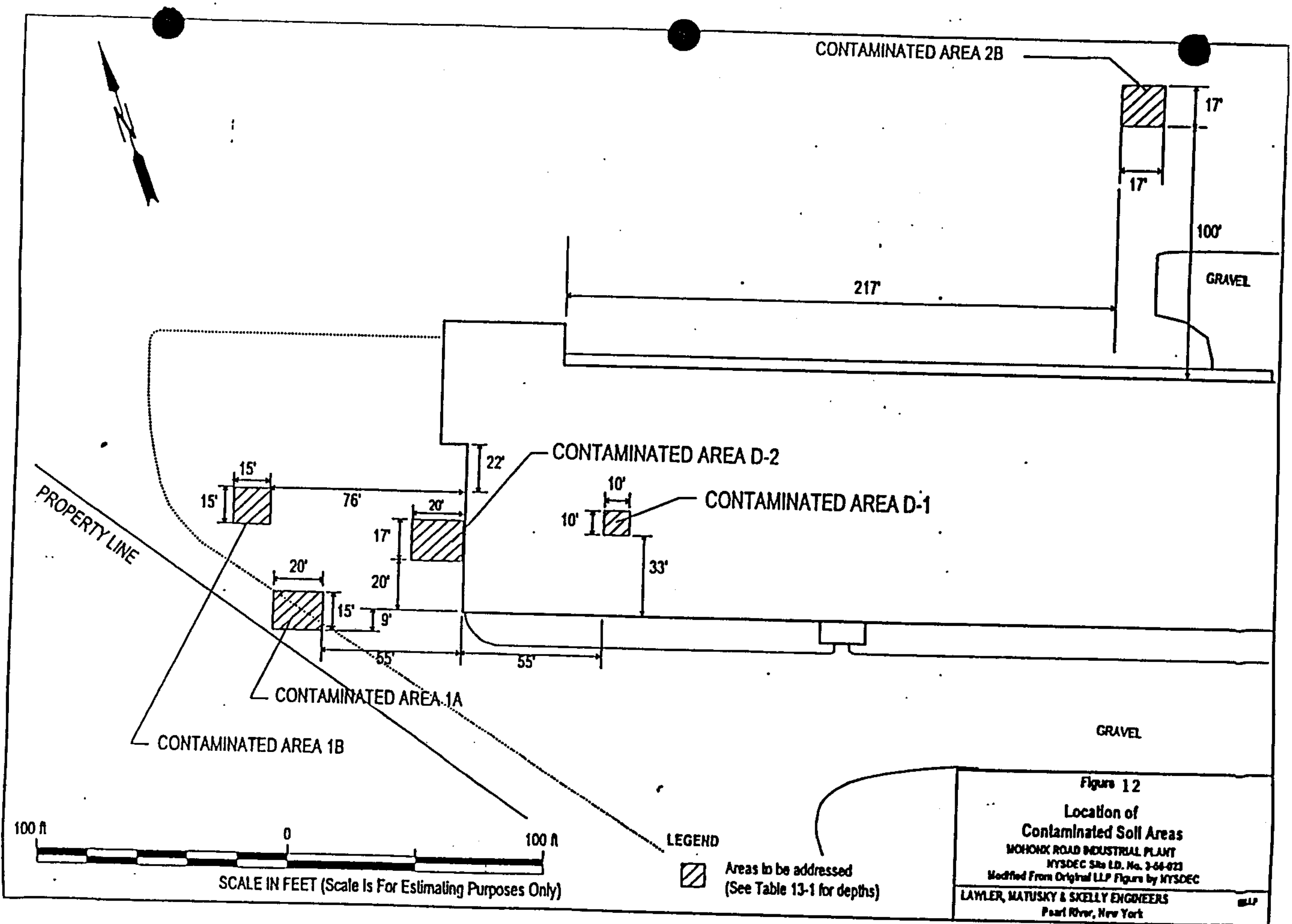
FIGURE 10
WELL LOCATION MAP
MOHONK ROAD INDUSTRIAL SITE
HIGH FALLS, NY
JUNE 1999

U.S. EPA ENVIRONMENTAL RESPONSE TEAM CENTER
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-C4-0022
V.O.# 03347-143-001-3407-01

407/WELL-LOC.DWG 6/11/99



MRTP-04
MRTP04-01 (4.3')
MRTP04-02 (2.0')
WEST BRANCH
(4-in. Orangeburg pipe)
MRTP-05
MRTP05-01 (3.5')
EAST BRANCH
(4-in. Orangeburg pipe)
MRMW-05
MRTP06-02 (6.0')
MRTP-06
MRTP06-01 (2.0')
MRTP-07
MRTP07-01 (3.5')
MRMW-04
TANK COVERS
MRTP-08
MRTP08-01 (4.0')
SANITARY LINE
(4-in. iron pipe)
DRAIN LINE
MRTP03-01*
MRTP-03
(Discontinuous 4-in. Orangeburg pipe)
Gravel
MRTP-09
MRTP09-01 (3.5')
4-in. PVC pipe
8-in. ORANGEBURG TERMINATION
Building
Gravel
Legend
Test pit
MRTP0#-01 (4.0')
Test pit sample location and depth
* Sample retained and submitted by NYSDEC
0
20 ft
40 ft
SCALE IN FEET
Figure 11
Underground Tank System Area
Test Pit Sample Locations
MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023
LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York


CONTAMINATED AREA 2B
17'
17'
100'
217'
GRAVEL
22'
CONTAMINATED AREA D-2
15'
15'
76'
20'
17'
10'
10'
CONTAMINATED AREA D-1
33'
20'
20'
15'
9'
55'
55'
PROPERTY LINE
CONTAMINATED AREA 1A
CONTAMINATED AREA 1B
GRAVEL
100 ft
0
100 ft
SCALE IN FEET (Scale Is For Estimating Purposes Only)
LEGEND
Areas to be addressed
(See Table 13-1 for depths)
Figure 12
Location of
Contaminated Soil Areas
Modified From Original LLP Figure by NYSDEC
Pearl River, New York

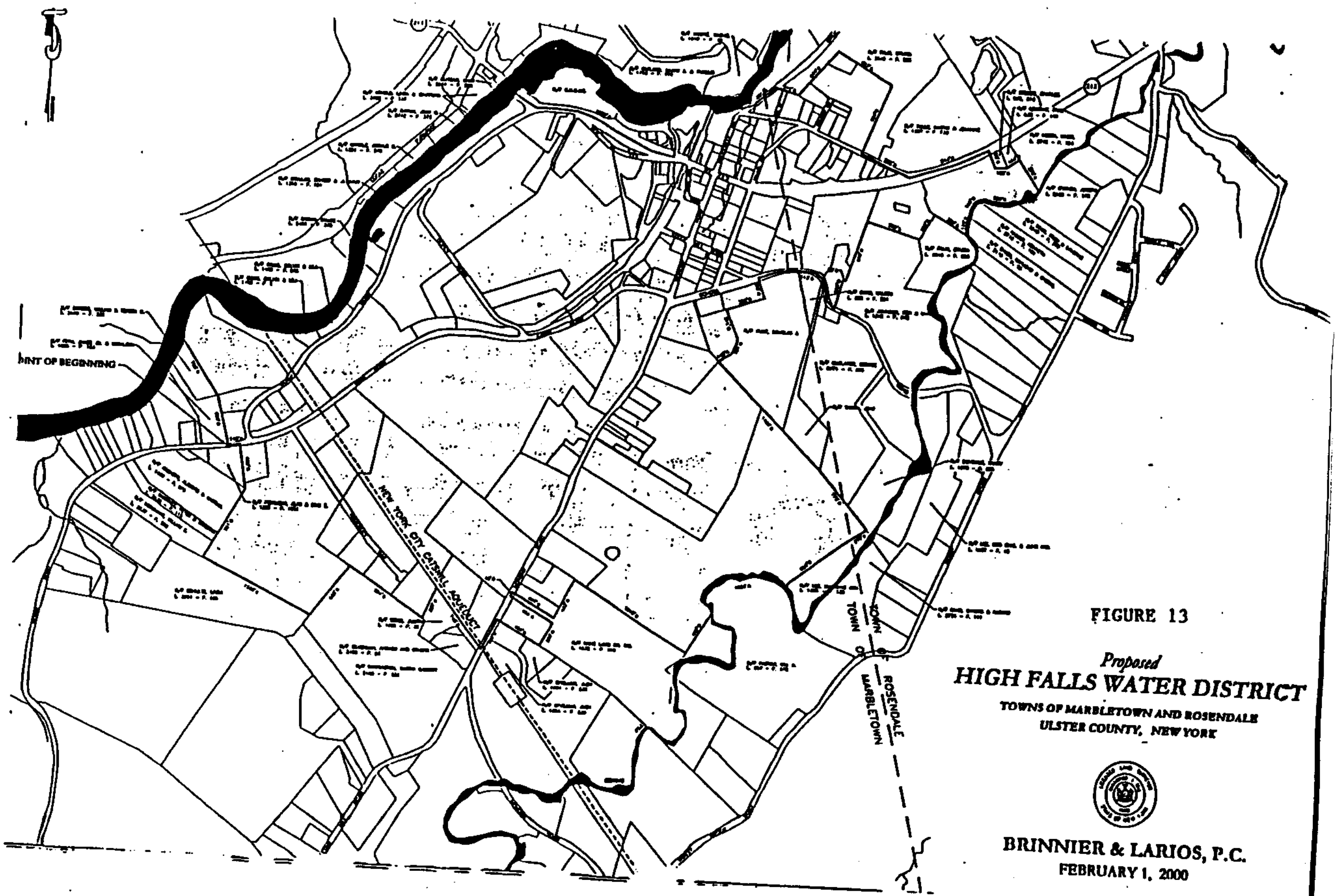


FIGURE 13

Proposed
HIGH FALLS WATER DISTRICT
TOWNS OF MARBLETOWN AND ROSENDALE
ULSTER COUNTY, NEW YORK

BRINNIER & LARIOS, P.C.
FEBRUARY 1, 2000

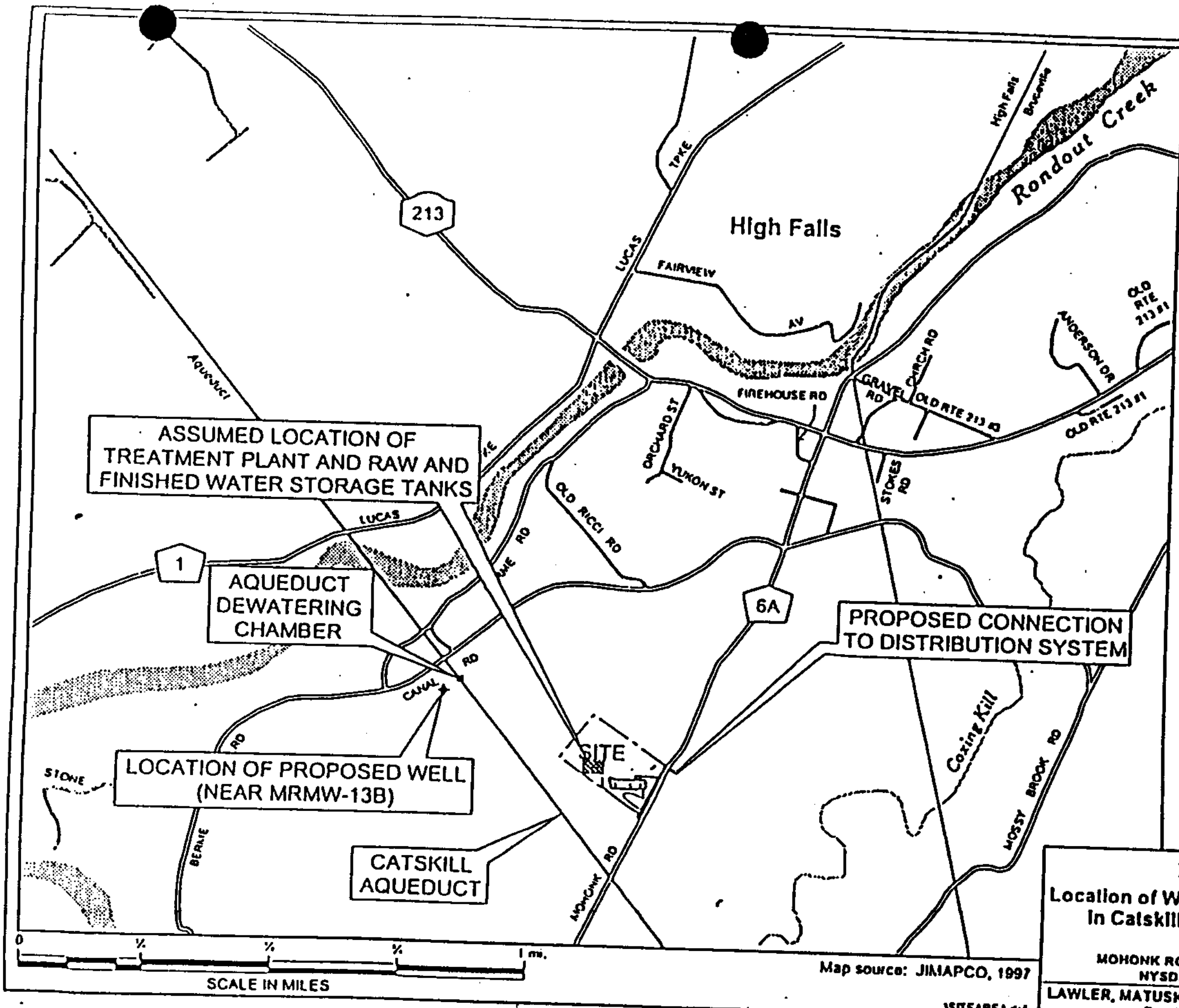


Figure 14
Location of Water Supply Structures In Catskill Aqueduct System
AWS 3
MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023
LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

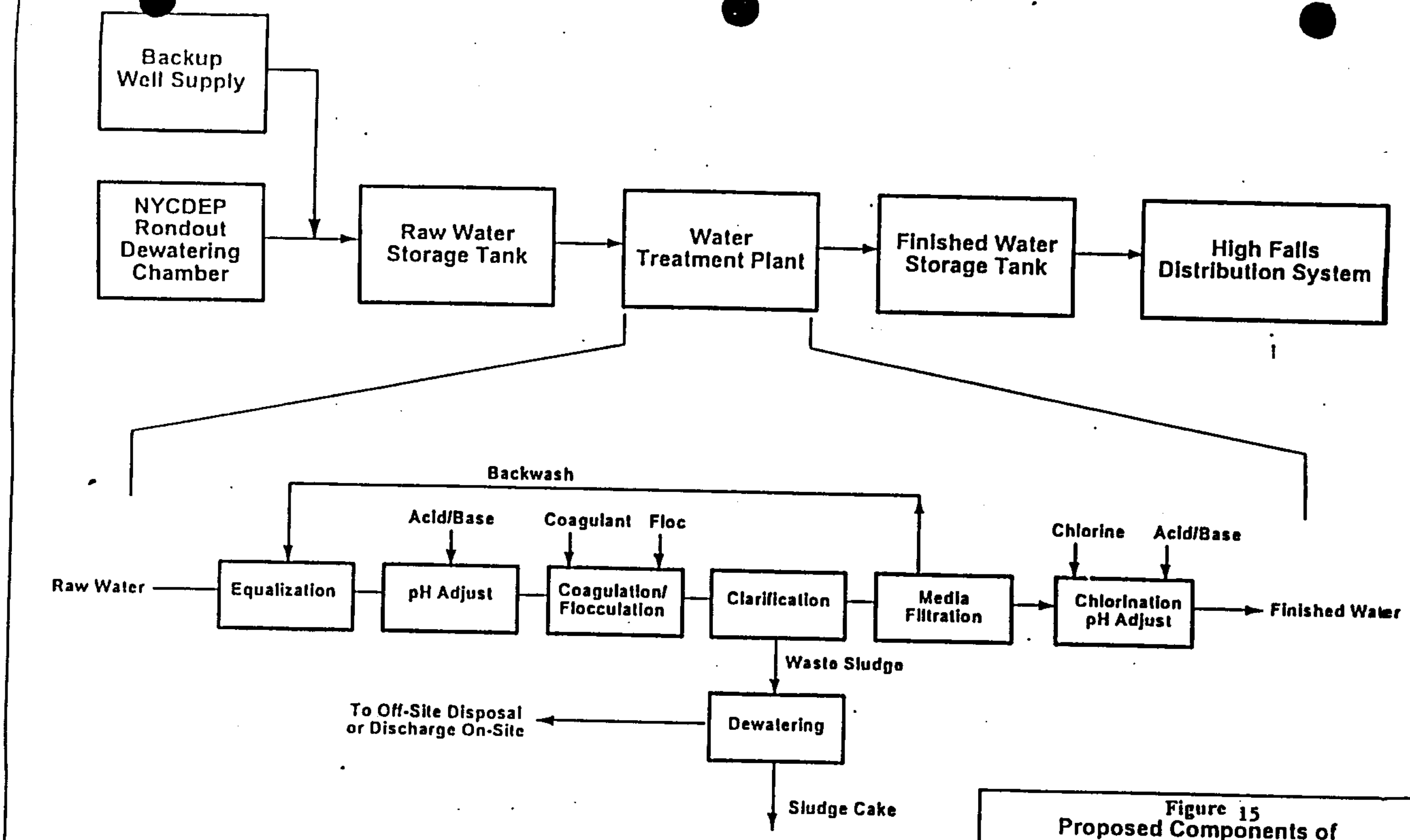


Figure 15
Proposed Components of Alternative AWS 3: Water Supply Using Catskill Aqueduct (Including Backup Supply)
MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023
LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

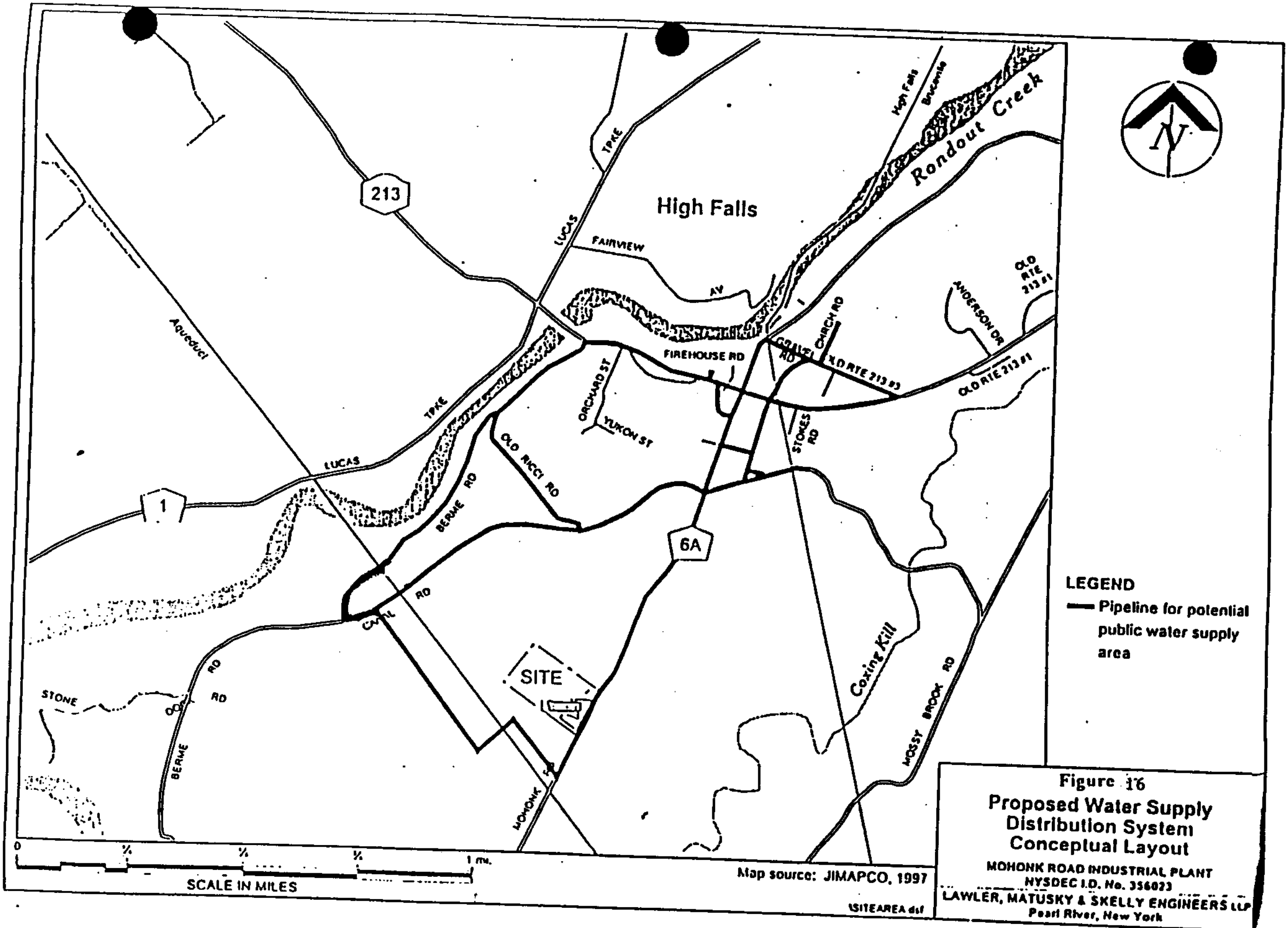


Figure 16
Proposed Water Supply Distribution System Conceptual Layout
MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023
LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

APPENDIX II

TABLES

SUMMARY OF EXISTING SLUDGE DATA (October 1996)

Mohonk Road Industrial Plant Site No. 356023

PARAMETER	BS2608
VOLATILE ORGANICS (mg/kg)	[DL: 200:1]
1,1-Dichloroethane	18,000
1,1,1-Trichloroethane	260,000
SEMIVOLATILE ORGANICS (mg/kg)	[DL: 20:1]
Phenol	4.2 j
1,4-Dichlorobenzene	130
4-Methylphenol	310
2-Methylnaphthalene	7.5 j
bis(2-Ethylhexyl)phthalate	7.3 j
PESTICIDES/PCBs (mg/kg)	
Endrin	0.15
gamma-Chlordane	0.11 p
CONVENTIONALS	
Total organic carbon (mg/kg)	49,100

j - Estimated concentration; compound present below quantitation limit.
p - Pesticide/Aroclor target analyte has >25% difference for the detected concentrations between the two GC columns.
DL - Diluted sample analysis.

•Disk No.: \\Lms-1\sys\SHARED\HAZWASTE\JOBS\800\\SC-250\HISTDATA.XLS Sludge Data 3/23/98 10:43:29 AM•

TABLE 2 (Page 1 of 22)

MONITORING WELL NO: DATE:	MRMW-1 Nov-96	MRMW-1 May-97	MRMW-1 Dec-97	MRMW-1B May-97	MRMW-1B Sep-97	MRMW-1B Dec-97	MRMW-1B May-98	NYSDEC CLASS GA STANDARDS (c)
VOLATILE ORGANICS (µg/l)								
Methylene chloride	2.0 b j	7 b j	ND	5.0 b j	ND	ND	1 j b	5.0
Acetone	ND	ND	ND	ND	ND	ND	ND	50 GV
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	ND	5.0
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	5.0
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	5.0
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	0.6
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	5.0
Benzene	ND	ND	ND	ND	ND	ND	ND	1.0
1,2-Dichloroethylene (total)	ND	ND	ND	ND	ND	ND	ND	5.0
Chloroform	ND	ND	ND	ND	ND	ND	ND	7.0
Trichloroethylene	ND	ND	ND	ND	ND	ND	ND	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	1.0
Toluene	ND	ND	ND	ND	ND	ND	ND	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	5.0

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
ND - Not detected at analytical detection limit.

TABLE 2 (Page 2 of 22)

MONITORING WELL NO: DATE:	MRMW-2 Nov-96	MRMW-2 May-97	MRMW-2 Dec-97	MRMW-3 Nov-96	DL MRMW-3 Nov-96	MRMW-3 May-97	MRMW-3DL May-97	NYSDEC CLASS GA STANDARDS (c)
VOLATILE ORGANICS (µg/l)					[DL: 2:1]		[DL: 2:1]	
Methylene chloride	ND	6 b J	ND	10 b J	3.0 b J	7.0 b J	11 b J	5.0
Acetone	ND	ND	ND	ND	ND	ND	ND	50 GV
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	ND	5.0
1,1-Dichloroethane	ND	ND	ND	13	13 J	10 J	10 J	5.0
1,1,1-Trichloroethane	18	18	28	250 e	230	220 e	210	5.0
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	0.6
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	5.0
Benzene	ND	1.0j	ND	ND	ND	7.0 J	10 J	1.0
1,2-Dichloroethylene (total)	ND	ND	ND	16	14 J	13	13 J	5.0
Chloroform	ND	ND	ND	ND	ND	ND	ND	7.0
Trichloroethylene	ND	ND	ND	54	53	45	43	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	1.0
Toluene	ND	ND	ND	ND	ND	ND	ND	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	5.0

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
b - Found in associated blanks.
j - Estimated concentration, compound present below quantitation limit.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
N - not detected at analytical detection limit

MONITORING WELL NO: DATE:	MRMW-3 Dec-97	MRMW-4 Nov-96	DL MRMW-4 Nov-96	DUP MRMW-4 Nov-96	MRMW-4 May-97	MRMW-4DL May-97	MRMW-4 Dec-97	NYSDEC CLASS GA STANDARDS (c)
VOLATILE ORGANICS (µg/l)		[DL: 250:1]			[DL: 5:1]	[DL: 100:1]	[DL: 110:1]	
Methylene chloride	ND	410 b j	2,000 b j	1,900 b j	49 b j	990 b j	ND	5.0
Acetone	ND	ND	ND	ND	ND	3,330 b	ND	50 GV
1,1-Dichloroethylene	ND	10,000	7,000 j	6,700 j	5,100 e	3,700	2,200	5.0
1,1-Dichloroethane	15 j	6,700	5,500 j	5,300 j	690	580 j	250 j	5.0
1,1,1-Trichloroethane	230	130,000 e	87,000	82,000	4,100 e	28,000	19,000	5.0
1,2-Dichloroethane	ND	ND	ND	ND	31 j	ND	ND	0.6
Carbon tetrachloride	ND	ND	ND	ND	27 j	ND	ND	5.0
Benzene	ND	ND	ND	ND	ND	ND	ND	1.0
1,2-Dichloroethylene (total)	16 j	ND	ND	ND	18 j	ND	ND	5.0
Chloroform	ND	ND	ND	ND	11 j	ND	ND	7.0
Trichloroethylene	41	3,300	2,400 j	2,300 j	2,300 e	2,400	2,500	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	18 j	ND	ND	1.0
Toluene	ND	ND	ND	ND	25 j	ND	ND	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	5.0

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
N - not detected at analytical detection limit.

DUP - Duplicate sample analysis.
GV - Guidance value

MONITORING WELL NO: DATE:	MRMW-4 May-98	MRMW-5 Nov-96	MRMW-5 May-97	MRMW-5 Dec-97	MRMW-5B May-97	MRMW-5B DL May-97	MRMW-5B DU May-97	MRMW-5B DUP/DL May-97	NYSDEC CLASS GA STANDARDS (c)
VOLATILE ORGANICS (µg/l)	[DL: 100:1]					[DL: 25:1]		[DL: 25:1]	
Methylene chloride	500 j b	ND	5.0 b j	ND	6.0 b j	330 b	6.0 b j	260 b j	5.0
Acetone	240 j b	ND	ND	ND	ND	ND	ND	ND	50 GV
1,1-Dichloroethylene	2,200	2.0 j	ND	3 j	500 e	380	520 e	360	5.0
1,1-Dichloroethane	100 j	ND	ND	0.9 j	50	43 j	52	42 j	5.0
1,1,1-Trichloroethane	15,000	48	22	51	700 e	3,900	720 e	3,800	5.0
1,2-Dichloroethane	ND	ND	ND	ND	6.0 j	ND	6.0 j	ND	0.6
Carbon tetrachloride	ND	ND	ND	ND	17	ND	18	ND	5.0
Benzene	ND	ND	ND	ND	5.0 j	ND	ND	ND	1.0
1,2-Dichloroethylene (total)	ND	ND	ND	ND	3.0 j	ND	3.0 j	ND	5.0
Chloroform	ND	ND	ND	ND	4.0 j	ND	4.0 j	ND	7.0
Trichloroethylene	1,800	1.0 j	4.0 j	4 j	180	140 j	180	140 j	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	5.0 j	ND	5.0 j	ND	1.0
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	5.0

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
ND - not detected at analytical detection limit.

DUP - Duplicate sample analysis.
GV - Guidance value

MONITORING WELL NO: DATE:	MRMW-5 Dec-97	MRMW-5B Sep-97	MRMW-5B Dec-97	MRMW-5B May-98	MRMW-5R May-98	MRMW-6B May-97	MRMW-6B Sep-97	NYSDEC CLASS GA STANDARDS (c)
VOLATILE ORGANICS (µg/l)		[DL: 35.7:1]	[DL: 14.2:1]	[DL: 20:1]	[DL: 10:1]			
Methylene chloride	ND	34 j	ND	150 jb	63 jb	5.0 b j	ND	5.0
Acetone	ND	ND	ND	ND	ND	ND	ND	50 GV
1,1-Dichloroethylene	3 j	410	200	390	270	7.0 j	16	5.0
1,1-Dichloroethane	0.9 j	120 j	40 j	31 j	56 j	2.0 j	4 j	5.0
1,1,1-Trichloroethane	51	4,900	1,800	2,800	1,300	40	93	5.0
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	0.6
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	5.0
Benzene	ND	ND	ND	ND	ND	1.0 j	ND	1.0
1,2-Dichloroethylene (total)	ND	ND	ND	ND	ND	ND	ND	5.0
Chloroform	ND	ND	ND	ND	ND	ND	ND	7.0
Trichloroethylene	4 j	230 j	110 j	150 j	61 j	ND	1 j	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	1.0
Toluene	ND	ND	ND	ND	ND	ND	ND	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	5.0

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

GV - Guidance value

TABLE 2 (Page 6 of 22)

MONITORING WELL NO: DATE:	MRMW-6B Dec-97	MRMW-6B May-98	MWMR-7B May-97	MRMW-7B Sep-97	MRMW-7B Dec-97	Duplicate of MRMW-7B] MRMW-7 Dec-97	MRMW-7B May-98	NYSDEC CLASS GA STANDARDS (c)
VOLATILE ORGANICS (µg/l)				[DL: 14.3:1]	[DL: 8.7:1]	[DL: 7.3:1]		
Methylene chloride	ND	ND	5.0 b j	ND	ND	ND	1 j b	5.0
Acetone	ND	ND	ND	96 j	ND	ND	ND	50 GV
1,1-Dichloroethylene	12	ND	1.0 j	ND	49 j	52 j	4 j	5.0
1,1-Dichloroethane	3 j	ND	ND	43 j	24 j	24 j	2 j	5.0
1,1,1-Trichloroethane	72	21	28	1,600	930	960	54	5.0
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	0.6
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	5.0
Benzene	ND	ND	1.0 j	ND	ND	ND	ND	1.0
1,2-Dichloroethylene (total)	ND	ND	ND	100 j	ND	ND	ND	5.0
Chloroform	ND	ND	ND	ND	ND	ND	ND	7.0
Trichloroethylene	ND	ND	ND	ND	15 j	15 j	ND	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	1.0
Toluene	ND	ND	ND	ND	ND	ND	1 j	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	5.0
Xylene	ND	ND	ND	ND	ND	ND	1 j	

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
ND - not detected at analytical detection limit.

GV - Guidance value

MONITORING WELL NO: DATE:	MRMW-7R May-98	MRMW-8B Sep-97	MRMW-8B Dec-97	MRMW-8B May-98	MRMW-9 Sep-97	MRMW-9 Dec-97	MRMW-9B Sep-97	NYSDEC CLASS GA STANDARDS (c)
VOLATILE ORGANICS (µg/l)	[DL:5 1]							
Methylene chloride	29 j b	ND	ND	ND	ND	ND	ND	5.0
Acetone	ND	ND	ND	ND	ND	ND	ND	50 GV
1,1-Dichloroethylene	**98**	ND	ND	ND	ND	ND	ND	5.0
1,1-Dichloroethane	**97**	ND	ND	ND	ND	ND	ND	5.0
1,1,1-Trichloroethane	**970**	ND	ND	ND	ND	ND	ND	5.0
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	0.6
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	5.0
Benzene	ND	ND	ND	ND	ND	ND	**5 j**	1.0
1,2-Dichloroethylene (total)	ND	ND	ND	ND	ND	ND	ND	5.0
Chloroform	ND	ND	ND	ND	ND	ND	ND	7.0
Trichloroethylene	5 j	ND	ND	ND	ND	ND	ND	5.0
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	1.0
Toluene	ND	ND	ND	ND	ND	ND	ND	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	5.0
Xylene	ND	ND	ND	ND	ND	ND	ND	

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
b - Found in associated blanks.
j - Estimated concentration, compound present below quantitation limit.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
N - not detected at analytical detection limit.

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MONITORING WELL NO: DATE:	MRMW-9B Dec-97	MRMW-9B May-98	MRMW-10B Sep-97	MRMW-10B Dec-97	MRMW-10B May-98	MRMW-11 Sep-97	NYSDEC CLASS GA TANDARDS (c)
VOLATILE ORGANICS (µg/l)							
Methylene Chloride	ND	3 b j	ND	ND	7 b j	ND	5.0
Acetone	ND	6 b j	ND	ND	3 j b	ND	50 GV
2-Butanone	ND	ND	ND	ND	2 j b	ND	5.0
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	5.0
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	5.0
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	0.6
Trichloroethylene	ND	ND	ND	ND	ND	ND	5.0
Benzene	ND	ND	ND	ND	ND	3 j	1.0
2-Hexanone	ND	ND	ND	ND	ND	ND	5.0
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	7.0

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
N - not detected at analytical detection limit.

GV - Guidance value

MONITORING WELL NO: DATE:	[Blind Dup of MW-11] MRMW-11C Sep-97	MRMW-11 Dec-97	MRMW-11B Sep-97	MRMW-11B Dec-97	MRMW-11B May-98	DL MRMW-11B May-98	NYSDEC CLASS GA TANDARDS (c
VOLATILE ORGANICS (µg/l)				[DL: 2.1:1]		[DL: 5:1]	
Methylene Chloride	ND	ND	ND	ND	1 j b	9 j b	5.0
Acetone	ND	ND	ND	ND	ND	ND	50 GV
2-Butanone	ND	ND	ND	ND	ND	ND	5.0
1,1-Dichloroethylene	ND	ND	40	52	110	110	5.0
1,1-Dichloroethane	ND	ND	46	33	39	39	5.0
1,1,1-Trichloroethane	ND	ND	210 e	300	490 e	540	0.6
Trichloroethylene	ND	ND	16	21	31	30	5.0
Benzene	3 j	ND	ND	ND	ND	ND	1.0
2-Hexanone	2 j	ND	ND	ND	ND	ND	5.0
1,1,2,2-Tetrachloroethane	1 j	ND	ND	ND	ND	ND	7.0

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
N - not detected at analytical detection limit.

GV - Guidance value

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MONITORING WELL NO: DATE:	MRMW-11C May-98	MRMW-12B Sep-97	MRMW-12B Dec-97	MRMW-12B May-98	MRMW-13B Sep-97	MRMW-13B Dec-97	MRMW-13B May-98	NYSDEC CLASS GA STANDARDS (c)
VOLATILE ORGANICS (µg/l)								
Methylene chloride	2 j b	ND	3 b j	3b j	ND	ND	1 b j	5.0
1,1-Dichloroethylene	17	5 j	1 j	3 j	ND	ND	ND	50 GV
1,1-Dichloroethane	18	11	2 j	3 j	ND	ND	ND	5.0
1,1,1-Trichloroethane	32	23	5 j	9 j	ND	ND	ND	5.0
Trichloroethylene	4 j	2 j	ND	ND	ND	ND	ND	5.0
Ethylbenzene	ND	ND	ND	2 j	ND	ND	ND	0.6
Toluene	4 j	ND	ND	ND	ND	ND	ND	5.0

Note: Numbers in bold exceed standard or guidance value.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
N - not detected at analytical detection limit.

GV - Guidance value

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MONITORING WELL NO: DATE:	MRMW-14B Sep-97	MRMW-14B Dec-97	MRMW-14B May-98	MRMW-15B May-98	MRPW-1 May-97	MRPW-2 Sep-97	MRPW-2 Dec-97	NYSDEC CLASS GA TANDARDS (a)
VOLATILE ORGANICS (µg/l)				[25:1]				
1,1-Dichloroethylene	ND	ND	ND	58	21	4 j	4 j	5.0
1,1-Dichloroethane	ND	ND	ND	24	23	ND	ND	5.0
1,1,1-Trichloroethane	ND	ND	ND	340	180	18	28	5.0
Trichloroethylene	ND	ND	ND	2 j	9 j	ND	ND	5.0
Methylene Chloride	ND	ND	2 j b	7 j b	5.0 b j	ND	ND	5.0
1,2-Dichloroethylene (tota	ND	ND	ND	ND	3.0 j	ND	ND	5.0
Acetone	ND	ND	ND	ND	10 b	ND	ND	50 GV
Freon 113	ND	ND	ND	ND	ND	ND	3 j	5.0

PARAMETER DATE:	FIELD BLANK Sep-97	FIELD BLANK Dec-97	TRIP BLANK Nov-96	TRIP BLANK May-97	TRIP BLANK Sep-97	TRIP BLANK Dec-97	TRIP BLANK May-98	NYSDEC CLASS GA TANDARDS (a)
VOLATILE ORGANICS (µg/l)								
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	ND	5.0
Methylene Chloride	ND	ND	3.0 b j	7 b j	ND	ND	6 b j	5.0
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	5.0
Acetone	ND	ND	ND	ND	ND	ND	5 b j	50 GV
Freon 113	ND	ND	ND	ND	ND	ND	NR	5.0

NOTE: Numbers in bold exceed standard or guidance value.
(a) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
● - Estimated concentration; exceeds GC/MS calibration range.
j - Estimated concentration; compound present below quantitation limit.

GV - Guidance value.
ND - Not detected at analytical detection limit.

MONITORING WELL NO.: DATE:	MRMW-1 Nov-96	MRMW-1 May-97	MRMW-1 Dec-97	MRMW-1B May-97	MRMW-1B Sep-97	MRMW-1B Sep-97	MRMW-1B Dec-97	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	DISSOLVED	TOTAL		
Aluminum	16,600 N	5,050	4,130	ND	127 B	ND	51 B	<5.0-1000	NS
Antimony	ND	ND	ND	ND	ND	4.7 B	ND	N/A	3.0
Arsenic	3.0 B	3.3 B	2.7 B	ND	5.0 B	2.5 B	ND	<1.0-30	25
Barium	291	145 B	115 B	80 B	162 B	85 B	96 B	10-500	1,000
Beryllium	0.84 B	0.78 B	ND	ND	ND	ND	0.11 B	<10	3.0 GV
Cadmium	ND	ND	0.65 B	3.5 B	ND	0.48 B	0.43 B	<1.0	5
Calcium	236,000	215,000	237,000	179,000	136,000	136,000	142,000	1,000-150,000	NS
Chromium	35	8.0 B	5.6 B	ND	3.0 B	ND	ND	<1.0-5.0	50
Cobalt	73	15 B	20 B	ND	4.8 B	3.8 B	3.7 B	<10	NS
Copper	96	29	18 B	3.3 B	8.0 B	7.2 B	4.5 B	<1.0-30	200
Iron	32,000	10,200	7,400	138	333	61 B	176	10-10,000	300(m)
Lead	19 N R	9.7	ND	1.8 B	2.6 B	ND	ND	<15	25
Magnesium	47,600	44,300	43,200	20,700	14,100	14,000	15,200	1,000-50,000	35,000 GV
Manganese	7,290	2,090	446	14 B	42	38	76	<1.0-1,000	300(m)
Mercury	ND	ND	ND	ND	0.67	0.29	0.52	<1.0	0.7
Nickel	106	59	31 B	14 B	6.6 B	4.9 B	1.8 B	<10-50	100
Potassium	4,480 B	1,890 B	2,130	ND	710 B	720 B	904 B	1,000-10,000	NS
Selenium	ND W N	1.6 B	ND N	1.9 B	ND	ND	ND N	<1.0-10	10
Silver	ND	ND	ND	ND	1.9 B	1.0 B	1.6 B	<5.0	50
Sodium	18,500	17,000	16,400	14,700	17,300	17,600	16,300	500-120,000	20,000
Thallium	ND W N	ND	ND	ND	ND	ND	ND	N/A	0.5GV
Vanadium	29 B	23 B	7.6 B	12 B	ND	ND	ND	<1.0-10	NS
Zinc	165	56	42	14 B	22	52	24	<10-2,000	2000 GV
Cyanide	ND	♦	ND	♦	ND	♦	ND	N/A	200

NOTE: Numbers in bold exceed standard.
♦ - Not analyzed.
(m) - Iron and manganese not to exceed 500 µg/l.
(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
N - Spiked sample recovery is not within control limits.
R - Duplicate analysis not within control limits.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
N/A - Not available.
ND - Not detected at analytical detection limit.
NS - No standard.
DUP - Duplicate sample analysis.

MONITORING WELL NO.: DATE:	MRMW-2 Nov-96	MRMW-2 May-97	MRMW-2 Dec-97	MRMW-3 Nov-96	MRMW-3 May-97	MRMW-3 Dec-97	MRMW-4 Nov-96	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL		
Aluminum	2,690 N	88 B	409	3,180 N	36 B	294	21,700 N	<5.0 -1000	NS
Antimony	ND	ND	ND	ND	ND	ND	ND	N/A	3.0
Arsenic	0.90 B	ND	ND	2.9 B	ND W	3.8 B	3.3 B	<1.0-30	25
Barium	62 B	26	30 B	212	130 B	128 B	202	10-500	1,000
Beryllium	ND	ND	0.14 B	0.28 B	0.79 B	ND	1.0 B	<10	3.0 GV
Cadmium	4.7 B	ND	0.54 B	ND	ND	ND	ND	<1.0	5
Calcium	112,000	104,000	109,000	302,000	261,000	237,000	189,000	1,000-150,000	NS
Chromium	7.2 B	ND	ND	9.4 B	ND	1.0 B	29	<1.0-5.0	50
Cobalt	4.0 B	ND	ND	10 B	ND	1.8 B	66	<10	NS
Copper	9.4 B	ND	2.3 B	16 B	ND	4.0 B	107	<1.0-30	200
Iron ♦	4,380	269	580	6,680	419	1,160	37,500	10-10,000	300(m)
Lead	13 N R	0.40 B	ND	13 N R	0.50 B	ND	28 N R	<15	25
Magnesium	10,700	7,860	6,670	51,700	51,900	45,300	23,700	1,000-50,000	35,000 GV
Manganese	131	9.2 B	9.9 B	5,040	2,800	2,580	2,200	<1.0-1,000	300(m)
Mercury	ND	ND	ND	ND	ND	ND	ND	<1.0	0.7
Nickel	13 B	ND	ND	33 B	12 B	11 B	82	<10-50	100
Potassium	2,050 B	ND	732 B	3,720 B	1,190 B	1,390 B	5,010	1,000-10,000	NS
Selenium	ND W N	1.8 B	ND N	ND W N	3.2 B	ND N	ND W N	<1.0-10	10
Silver	ND	ND	ND	ND	ND	ND	ND	<5.0	50
Sodium	9,890	7,370	7,520	322,000	203,000	152,000	27,300	500-120,000	20,000
Thallium	ND N	ND W	ND	ND W N	ND W	ND	ND W N	N/A	0.5GV
Vanadium	8.6 B	8.0 B	1.2 B	11 B	20 B	1.3 B	34 B	<1.0-10	NS
Zinc	26	6.1 B	15 B	35	9.5 B	37	186	<10-2,000	2000 GV
Cyanide	ND	♦	ND	ND	♦	ND	ND	N/A	200

NOTE: Numbers in bold exceed standard.
♦ - Not analyzed.
(m) - Iron and manganese not to exceed 500 µg/l.
(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
N - Spiked sample recovery is not within control limits.
R - Duplicate analysis not within control limits.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
N/A - Not available.
ND - Not detected at analytical detection limit.
NS - No standard.
DUP - Duplicate sample analysis.

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MONITORING WELL NO.: DATE:	DUP MRMW-4 Nov-96	MRMW-4 May-97	MRMW-4 Dec-97	MRMW-5 Nov-96	MRMW-5 May-97	MRMW-5 Dec-97	MRMW-5B May-97	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL		
Aluminum	25,900 N	ND	634	8,250 N	1,090	665	ND	<5.0-1000	NS
Antimony	ND	ND	ND	ND	ND	ND	ND	N/A	3.0
Arsenic	5.3 B	1.8 B	3.1 B	1.7 B	ND	ND	ND	<1.0-30	25
Barium	250	42 B	56 B	92 B	17 B	18 B	147 B	10-500	1,000
Beryllium	1.2 B	1.2 B	ND	0.39 B	0.81 B	ND	1.2 B	<10	3.0 GV
Cadmium	ND	ND	1.7 B	ND	ND	0.52 B	ND	<1.0	5
Calcium	199,000	149,000	157,000	106,000	47,100	63,600	117,000	1,000-150,000	NS
Chromium	36	ND	ND	12	ND	ND	ND	<1.0-5.0	50
Cobalt	76	12 B	4.8 B	48 B	ND	ND	ND	<10	NS
Copper	135	3.3 B	7.5 B	28	6.5 B	ND	23 B	<1.0-30	200
Iron	48,800	54 B	1,050	13,300	1,660	958	346	10-10,000	300(m)
Lead	29 N R	3.6	ND	8.2 N R	1.8 B	ND	ND	<15	25
Magnesium	24,600	13,000	12,000	6,610	3,940 B	3,960 B	6,850	1,000-50,000	35,000 GV
Manganese	2,410	1,940	1,270	560	55	25	9.2 B	<1.0-1,000	300(m)
Mercury	ND	ND	ND	ND	ND	ND	ND N	<1.0	0.7
Nickel	88	32 B	9.1 B	35 B	17 B	ND	ND	<10-50	100
Potassium	4,890 B	ND	933 B	2,410 B	ND	690 B	ND	1,000-10,000	NS
Selenium	ND W N	ND	ND N	ND W N	1.8 B	ND N	ND	<1.0-10	10
Silver	ND	ND	ND	ND	ND	ND	14	<5.0	50
Sodium	28,500	28,400	28,000	6,640	7,670	7,840	6,570	500-120,000	20,000
Thallium	ND W N	1.4 B W	ND	ND N	ND W	ND	ND W	N/A	0.5GV
Vanadium	40 B	11 B	1.7 B	16 B	6.7 B	ND	8.8 B	<1.0-10	NS
Zinc	231	22	21	65	29	11 B	6.1 B	<10-2,000	2000 GV
Cyanide	ND	•	ND	ND	•	ND	•	N/A	200

NOTE: Numbers in bold exceed standard.

- • - Not analyzed.
- (m) - Iron and manganese not to exceed 500 µg/l.
- (n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
- B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
- N - Spiked sample recovery is not within control limits.
- R - Duplicate analysis not within control limits.
- (c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
- W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
- GV - Guidance value.
- N/A - Not available.
- ND - Not detected at analytical detection limit.
- NS - No standard.
- DUP - Duplicate sample analysis.

MONITORING WELL NO.: DATE:	MRMW-5B DUP May-97	MRMW-5B Sep-97	MRMW-5B Sep-97	MRMW-5B Dec-97	MRMW-5R May-98	MRMW-5R Oct-98	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	TOTAL	TOTAL	DISSOLVED	TOTAL	TOTAL			
Aluminum	60 B	557	86 B	349	408	207	<5.0-1000	NS
Antimony	ND	ND	**3.3 B**	ND	ND	ND	N/A	3.0
Arsenic	ND	3.4 B	3.3 B	ND	4.1 B	8.2	<1.0-30	25
Barium	130 B	259	124 B	149 B	235	314	10-500	1,000
Beryllium	1.2 B	ND	ND	0.11 B	ND	ND	<10	3.0 GV
Cadmium	ND	ND	0.52 B	1.0 B	ND	ND	<1.0	5
Calcium	113,000	124,000	123,000	124,000	80,700	56,500	1,000-150,000	NS
Chromium	ND	1.6 B	ND	ND	2.3 B	2.4	<1.0-5.0	50
Cobalt	ND	1.6 B	ND	ND	3.3 B	3.8	<10	NS
Copper	23 B	13 B	4.2 B	11 B	9.2 B	11.4	<1.0-30	200
Iron	**353**	738	119	**369**	**905**	**830**	10-10,000	300(m)
Lead	1.5 B	ND	ND	ND	ND	2.5	<15	25
Magnesium	6,550	9,200	9,110	7,630	8,340	6,160	1,000-50,000	35,000 GV
Manganese	14 B	49	9.2 B	13 B	33	42.9	<1.0-1,000	300(m)
Mercury	ND N	ND	ND	ND	ND	ND	<1.0	0.7
Nickel	ND	3.8 B	2.9 B	ND	5.0 B	3.7	<10-50	100
Potassium	ND	534 B	353 B	195 B	998 B	4,770	1,000-10,000	NS
Selenium	ND W	ND	ND	ND N	ND	ND	<1.0-10	10
Silver	11	41	5.0 B	18	ND	ND	<5.0	50
Sodium	6,260	9,040	9,040	7,020	7,930	11,000	500-120,000	20,000
Thallium	ND W	ND	ND	ND	ND	3.5	N/A	0.5GV
Vanadium	9.5 B	1.7 B	1.2 B	ND	ND	1.4	<1.0-10	NS
Zinc	6.1 B	9.1 B	23	6.5 B	13 B	10.9	<10-2,000	2000 GV
Cyanide	♦	ND	♦	ND	♦		N/A	200

NOTE: Numbers in bold exceed standard.
♦ - Not analyzed.
(m) - Iron and manganese not to exceed 500 µg/l.
(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
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N - Spiked sample recovery is not within control limits.
R - Duplicate analysis not within control limits.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.

W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
N/A - Not available.
ND - Not detected at analytical detection limit.
NS - No standard.
DUP - Duplicate sample analysis.

MONITORING WELL NO.: DATE:	MRMW-6B May-97	MRMW-6B Sep-97	MRMW-6B Sep-97	MRMW-6B Dec-97	MRMW-7B May-97	MRMW-7B Sep-97	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	TOTAL	TOTAL	DISSOLVE	TOTAL	TOTAL	TOTAL		
Aluminum	292	24 B	ND	457	348	84 B	<5.0 -1000	NS
Antimony	ND	ND	4.8 B	ND	ND	ND	N/A	3.0
Arsenic	2.3 B	3.2 B	ND	15	2.1 B	ND	<1.0-30	25
Barium	151 B	101 B	147 B	158 B	173 B	173 B	10-500	1,000
Beryllium	ND	ND	ND	ND	ND	ND	<10	3.0 GV
Cadmium	ND	ND	ND	0.54 B	ND	ND	<1.0	5
Calcium	109,000	123,000	82,400	111,000	65,700	83,400	1,000-150,000	NS
Chromium	ND	1.1 B	ND	2.1 B	5.5 B	ND	<1.0-5.0	50
Cobalt	6.9 B	2.5 B	ND	22 B	ND	ND	<10	NS
Copper	23 B	4.6 B	13 B	16 B	55	26	<1.0-30	200
Iron	810	99 B	36 B	836	1,710	280	10-10,000	300(m)
Lead	6.1	ND	ND	6.5	2.8 B	ND	<15	25
Magnesium	16,000	17,000	17,300	17,900	17,000	17,300	1,000-50,000	35,000 GV
Manganese	22	2.0 B	12 B	16 B	38	17	<1.0-1,000	300(m)
Mercury	ND	ND	ND	ND	ND	ND	<1.0	0.7
Nickel	ND	3.8 B	9.9 B	8.7 B	27 B	11 B	<10-50	100
Potassium	4,320 B	845 B	651 B	7,100	3,420 B	692 B	1,000-10,000	NS
Selenium	3.7 B	ND	ND	ND N	2.8 B	ND	<1.0-10	10
Silver	5.4 B	2.0 B	1.6 B	8.7 B	9.3 B	2.6 B	<5.0	50
Sodium	16,900	14,200	5,400	14,000	4,460 B	5,490	500-120,000	20,000
Thallium	ND W	ND	ND	ND	ND W	ND	N/A	0.5GV
Vanadium	8.2 B	1.3 B	1.3 B	1.6 B	ND	ND	<1.0-10	NS
Zinc	53	12 B	59	42	22	21	<10-2,000	2000 GV
Cyanide	♦	ND	♦	ND	♦	ND	N/A	200

NOTE: Numbers in bold exceed standard.
♦ - Not analyzed.
(m) - Iron and manganese not to exceed 500 µg/l.
(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
N - Spiked sample recovery is not within control limits.
R - Duplicate analysis not within control limits.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
N/A - Not available.
ND - Not detected at analytical detection limit.
NS - No standard.
DUP - Duplicate sample analysis.

MONITORING WELL NO.: DATE:	MRMW-7B Sep-97	MRMW-7B Dec-97	[Blind Duplicate of MRMW-7B] MRMW-7] Dec-97	MRMW-7R May-98	MRMW-8B Sep-97	MRMW-8B Sep-97	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	DISSOLVED	TOTAL	TOTAL	TOTAL	TOTAL	DISSOLVED		
Aluminum	53 B	153 B	184 B	70 B	839	45 B	<5.0 -1000	NS
Antimony	3.7 B	ND	ND	ND	ND	ND	N/A	3.0
Arsenic	2.9 B	ND	3.7 B	4.9 B	76	26	<1.0-30	25
Barium	96 B	158 B	164 B	95 B	954	827	10-500	1,000
Beryllium	ND	0.10 B	0.14 B	ND	ND	ND	<10	3.0 GV
Cadmium	ND	ND	ND	ND	ND	ND	<1.0	5
Calcium	120,000	78,400	81,000	63,900	45,600	42,800	1,000-150,000	NS
Chromium	ND	ND	ND	2.6 B	7.7	B	<1.0-5.0	50
Cobalt	1.7 B	ND	ND	ND	2.6 B	ND	<10	NS
Copper	2.7 B	17 B	18 B	7.4 B	16 B	ND	<1.0-30	200
Iron	26 B	183	206	10300	27,600	1,050	10-10,000	300(m)
Lead	ND	ND	ND	ND	25	ND	<15	25
Magnesium	16,600	16,900	17,400	15,500	8,980	8,800	1,000-50,000	35,000 GV
Manganese	3.1 B	9.3 B	11 B	174	679	387	<1.0-1,000	300(m)
Mercury	ND	ND	ND	ND	ND	ND	<1.0	0.7
Nickel	3.2 B	4.1 B	4.9 B	3.5 B	3.9 B	ND	<10-50	100
Potassium	732 B	798 B	698 B	7690	4,430 B	4,290 B	1,000-10,000	NS
Selenium	ND	ND N	ND N	ND	ND	ND	<1.0-10	10
Silver	1.6 B	3.2 B	1.9 B	ND	ND	ND	<5.0	50
Sodium	13,800	5,790	6,010	7,950	30,300	30,900	500-120,000	20,000
Thallium	ND	ND	ND	ND	ND	ND	N/A	0.5GV
Vanadium	1.3 B	ND	ND	ND	ND	ND	<1.0-10	NS
Zinc	145	17 B	7.3 B	38	29	6.5 B	<10-2,000	2000 GV
Cyanide	•	ND	ND	•	ND	•	N/A	200

NOTE: Numbers in bold exceed standard.
- • - Not analyzed.
- (m) - Iron and manganese not to exceed 500 µg/l.
- (n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
- B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
- N - Spiked sample recovery is not within control limits.
- R - Duplicate analysis not within control limits.
- (c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
- W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
- GV - Guidance value.
- N/A - Not available.
- ND - Not detected at analytical detection limit.
- NS - No standard.
- DUP - Duplicate sample analysis.

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MONITORING WELL NO.: DATE:	MRMW-8B Dec-97	MRMW-9 Sep-97	MRMW-9 Sep-97	MRMW-9 Dec-97	MRMW-9B Sep-97	MRMW-9B Sep-97	MRMW-9B Dec-97	MRMW-10B Sep-97	MRMW-10B Sep-97	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	TOTAL	TOTAL	DISSOLVE	TOTAL	TOTAL	DISSOLVED	TOTAL	TOTAL	DISSOLVED		
Aluminum	133 B	564	55 B	3,990	955	ND	36 B	867	ND	<5.0 -1000	NS
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	3.8 B	N/A	3.0
Arsenic	20	7.9 B	5.2 B	9.9 B	5.6 B	ND	4.0 B	ND	ND	<1.0-30	25
Barium	432	50 B	47 B	76 B	154 B	109 B	44 B	108 B	96 B	10-500	1,000
Beryllium	ND	ND	ND	0.18 B	ND	ND	ND	ND	ND	<10	3.0 GV
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1.0	5
Calcium	21,600	20,900	21,300	25,500	28,700	24,400	7,470	32,300	32,600	1,000-150,000	NS
Chromium	ND	ND	3.6 B	3.9 B	1.4 B	ND	ND	ND	ND	<1.0-5.0	50
Cobalt	ND	ND	ND	2.0 B	4.2 B	ND	ND	ND	ND	<10	NS
Copper	3.9 B	ND	9.4 B	7.4 B	8.1 B	ND	ND	ND	ND	<1.0-30	200
Iron	14,200	945	ND	5,010	24,200	125	5,880	1,200	ND	10-10,000	300(m)
Lead	2.1 B	ND	ND	2.6 B	12	ND	ND	1.7 B	ND	<15	25
Magnesium	4,970 B	4,080 B	4,080 B	5,230	5,910	5,160	3,390 B	5,990	5,950	1,000-50,000	35,000 GV
Manganese	331	75	61	140	574	223	100	78	72	<1.0-1,000	300(m)
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1.0	0.7
Nickel	ND	ND	1.2 B	3.9 B	5.5 B	ND	ND	1.2 B	ND	<10-50	100
Potassium	8,860	2,310 B	2,310 B	2,780 B	2,790 B	2,320 B	17,300	1,080 B	782 B	1,000-10,000	NS
Selenium	ND N	ND	ND	ND N	ND	ND	ND N	ND	ND	<1.0-10	10
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	<5.0	50
Sodium	31,400	23,000	23,200	21,800	20,800	19,600	28,600	2,380 B	2,790 B	500-120,000	20,000
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	N/A	0.5GV
Vanadium	ND	ND	ND	8.0 B	ND	ND	ND	ND	ND	<1.0-10	NS
Zinc	9.2 B	28	22	24	39	4.3 B	12 B	8.5 B	44	<10-2,000	2000 GV
Cyanide	ND	ND	♦	ND	ND	♦	ND	ND	♦	N/A	200

NOTE: Numbers in bold exceed standard.
(m) - Iron and manganese not to exceed 500 µg/l.
(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
N - Spiked sample recovery is not within control limits.
R - Duplicate analysis not within control limits.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.

W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
N/A - Not available.
ND - Not detected at analytical detection limit.
NS - No standard.
DUP - Duplicate sample analysis.

TABLE 2 (Page 19 of 22)

WELL NO.: DATE:	MRMW-10B Dec-97	MRMW-11 Sep-97	MRMW-11 Sep-97	MRMW-11C Sep-97	MRMW-11C Sep-97	MRMW-11B Sep-97	MRMW-11B Sep-97	MRMW-11B Dec-97	MRMW-11C May-98	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	TOTAL	TOTAL	DISSOLVE	TOTAL	DISSOLVE	TOTAL	DISSOLVE	TOTAL	TOTAL		
Aluminum	13,100	778	146 B	556	85 B	529	23 B	122 B	685	<5.0 -1000	NS
Antimony	ND	ND	ND	ND	ND	ND	5.4 B	ND	ND	N/A	3.0
Arsenic	19	ND	ND	3.7	4.1 B	4.5 B	ND	5.0 B	4.3 B	<1.0-30	25
Barium	412	147 B	140 B	147 B	142 B	209	203	168 B	118 B	10-500	1,000
Beryllium	1.3 B	ND	ND	ND	ND	ND	ND	ND	ND	<10	3.0 GV
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1.0	5
Calcium	34,900	92,600	85,400	90,200	87,600	69,900	74,600	73,400	87,000	1,000-150,000	NS
Chromium	16	2.8 B	2.8 B	3.2 B	ND	4.8 B	ND	ND	ND	<1.0-5.0	50
Cobalt	12 B	22 B	16 B	18 B	13 B	9.3 B	7.1 B	1.7 B	18 B	<10	NS
Copper	18 B	3.0 B	3.3 B	2.3 B	1.2 B	15 B	4.9 B	2.8 B	1.8 B	<1.0-30	200
Iron	40,000	2,000	362	1,350	183	38,500	14,800	19,600	1,410	10-10,000	300(m)
Lead	13	ND	ND	ND	ND	13	1.8 B	ND	ND	<15	25
Magnesium	9,330	21,200	20,600	21,000	21,100	12,900	13,400	13,100	22,700	1,000-50,000	35,000 GV
Manganese	532	309	252	291	258	680	552	325	314	<1.0-1,000	300(m)
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1.0	0.7
Nickel	ND	39 B	6.7 B	6.1 B	6.2 B	5.2 B	2.1 B	ND	1.8 B	<10-50	100
Potassium	4,640 B	3,310 B	4,200 B	3,50 B	4,240 B	5,060	4,630 B	3,590 B	2,900 B	1,000-10,000	NS
Selenium	ND N	ND	ND	ND	ND	ND	ND	ND N	ND N	<1.0-10	10
Silver	ND	1.6 B	1.3 B	ND	ND	ND	ND	ND	ND	<5.0	50
Sodium	2,900 B	9,410	10,300	9,600	10,400	7,910	8,210	7,100	11,000	500-120,000	20,000
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	N/A	0.5GV
Vanadium	29 B	2.8 B	1.5 B	1.6 B	ND	ND	ND	ND	ND	<1.0-10	NS
Zinc	228	19 B	39	12 B	37	26	29	20 B	19 B	<10-2,000	2000 GV
Cyanide	ND	ND	♦	ND	♦	ND	♦	ND	ND	N/A	200

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♦ - Not analyzed.
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R - Duplicate analysis not within control limits.
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W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
N/A - Not available.
ND - Not detected at analytical detection limit.
NS - No standard.
DUP - Duplicate sample analysis.

MONITORING WELL NO.: DATE:	MRMW-12B Sep-97	MRMW-12B Sep-97	MRMW-12B Dec-97	MRMW-13B Sep-97	MRMW-13B Sep-97	MRMW-13B Dec-97	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	TOTAL	DISSOLVE	TOTAL	TOTAL	DISSOLVE	TOTAL		
Aluminum	91 B	ND	48 B	ND	ND	ND	<5.0 -1000	NS
Antimony	ND	ND	ND	ND	ND	ND	N/A	3.0
Arsenic	21	19	25	20	19	18	<1.0-30	25
Barium	324	311	322	90 B	89 B	90 B	10-500	1,000
Beryllium	ND	ND	ND	ND	ND	ND	<10	3.0 GV
Cadmium	ND	ND	ND	ND	ND	ND	<1.0	5
Calcium	50,300	49,800	32,000	49,500	48,900	48,200	1,000-150,000	NS
Chromium	1.1 B	ND	1.9 B	ND	ND	ND	<1.0-5.0	50
Cobalt	37 B	36 B	29 B	ND	ND	2.0 B	<10	NS
Copper	3.3 B	ND	5.3 B	ND	ND	ND	<1.0-30	200
Iron	**25,900**	**21,600**	**38,400**	**2,450**	**2,360**	**2,490**	10-10,000	300(m)
Lead	4.9	ND	2.8 B	ND	ND	ND	<15	25
Magnesium	5,380	5,360	3,110 B	9,410	9,310	9,200	1,000-50,000	35,000 GV
Manganese	**2000**	**1,970**	**1,510**	132	131	127	<1.0-1,000	300(m)
Mercury	ND	ND	ND	ND	ND	ND	<1.0	0.7
Nickel	5.0 B	4.4 B	5.9 B	1.4 B	1.5 B	ND	<10-50	100
Potassium	1,610 B	1,660 B	3,120 B	1,090 B	1,070 B	916 B	1,000-10,000	NS
Selenium	ND	ND	ND N	ND	ND	NDN	<1.0-10	10
Silver	ND	ND	ND	ND	ND	ND	<5.0	50
Sodium	8,270	8,140	6,340	19,300	19,000	18,000	500-120,000	20,000
Thallium	ND	ND	ND	ND	ND	ND	N/A	0.5GV
Vanadium	ND	ND	ND	ND	ND	ND	<1.0-10	NS.
Zinc	31	34	36	8.7 B	41	11 B	<10-2,000	2000 GV
Cyanide	ND	♦	ND	ND	♦	ND	N/A	200

NOTE: Numbers in bold exceed standard.

♦ - Not analyzed
(m) - Iron and manganese not to exceed 500 µg/l.
(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
N - Spiked sample recovery is not within control limits.
R - Duplicate analysis not within control limits.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.

W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
N/A - Not available.
ND - Not detected at analytical detection limit.
NS - No standard.
DUP - Duplicate sample analysis.

MONITORING WELL NO.: DATE:	MRMW-14B Sep-97	MRMW-14B Sep-97	MRMW-14B Dec-97	MRPW-1 May-97	MRPW-2 Sep-97	MRPW-2 Sep-97	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	TOTAL	DISSOLVE	TOTAL	TOTAL	TOTAL	DISSOLVED		
Aluminum	55 B	41 B	24 B	ND	2,030	ND	<5.0 -1000	NS
Antimony	ND	ND	ND	37 B	ND	3.7 B	N/A	3.0
Arsenic	3.6 B	ND	7.7 B	ND	13	2.8 B	<1.0-30	25
Barium	3,800	3,660	3,390	294	171 B	139 B	10-500	1,000
Beryllium	ND	ND	ND	1.2 B	0.14 B	ND	<10	3.0 GV
Cadmium	ND	ND	ND	ND	ND	ND	<1.0	5
Calcium	42,300	41,600	46,200	99,200	113,000	113,000	1,000-150,000	NS
Chromium	ND	ND	ND	ND	5.5 B	ND	<1.0-5.0	50
Cobalt	6.4 B	5.1 B	6.5 B	ND	11 B	ND	<10	NS
Copper	2.2 B	1.4 B	1.5 B	ND	13 B	1.5 B	<1.0-30	200
Iron	9,410	2,280	6,460	16,700	5,560	49 B	10-10,000	300(m)
Lead	ND	ND	ND	0.70 B	17	ND	<15	25
Magnesium	10,500	10,500	10,300	15,400	16,900	16,500	1,000-50,000	35,000 GV
Manganese	557	494	643	168	391	62	<1.0-1,000	300(m)
Mercury	ND	ND	ND	ND N	ND	ND	<1.0	0.7
Nickel	3.3 B	3.8 B	1.3 B	18 B	7.7 B	2.3 B	<10-50	100
Potassium	2,380 B	2,280 B	1,440 B	ND	5,940	5,330	1,000-10,000	NS
Selenium	ND	ND	ND N	1.5 B	ND	ND	<1.0-10	10
Silver	ND	ND	ND	ND	1.3 B	ND	<5.0	50
Sodium	23,100	22,900	21,900	10,700	20,500	20,400	500-120,000	20,000
Thallium	ND	ND	ND	ND	ND	ND	N/A	0.5GV
Vanadium	ND	ND	ND	6.2 B	4.4 B	ND	<1.0-10	NS
Zinc	8.3 B	153	6.4 B	14 B	57	17 B	<10-2,000	2000 GV
Cyanide	ND	•	ND	•	ND	•	N/A	200

NOTE: Numbers in bold exceed standard.
- • - Not analyzed.
- (m) - Iron and manganese not to exceed 500 µg/l.
- (n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
- B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
- N - Spiked sample recovery is not within control limits.
- R - Duplicate analysis not within control limits.
- (c) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
- W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
- GV - Guidance value.
- N/A - Not available.
- ND - Not detected at analytical detection limit.
- NS - No standard.
- DUP - Duplicate sample analysis.

MONITORING WELL NO.: DATE:	MRPW-2 Dec-97	TRIP BLANK Sep-97	TRIP BLANK Dec-97	NATURAL AMBIENT GROUNDWATER RANGES (n)	NSDEC CLASS GA STANDARDS (c)
METALS (µg/l)	**TOTAL**	**TOTAL**	**TOTAL**		
Aluminum	49 B	ND	ND	<5.0 -1000	NS
Antimony	ND	ND	ND	N/A	3.0
Arsenic	3.4 B	ND	ND	<1.0-30	25
Barium	84 B	ND	ND	10-500	1,000
Beryllium	ND	ND	ND	<10	3.0 GV
Cadmium	ND	ND	ND	<1.0	5
Calcium	83,100	ND	ND	1,000-150,000	NS
Chromium	ND	ND	ND	<1.0-5.0	50
Cobalt	ND	ND	ND	<10	NS
Copper	90	ND	ND	<1.0-30	200
Iron	115	ND	ND	10-10,000	300(m)
Lead	3.8	ND	ND	<15	25
Magnesium	9,600	ND	ND	1,000-50,000	35,000 GV
Manganese	9.5 B	ND	ND	<1.0-1,000	300(m)
Mercury	ND	ND	ND	<1.0	0.7
Nickel	ND	ND	ND	<10-50	100
Potassium	11,600	ND	ND	1,000-10,000	NS
Selenium	ND N	ND	ND	<1.0-10	10
Silver	ND	ND	ND	<5.0	50
Sodium	11,900	ND	ND	500-120,000	20,000
Thallium	ND	ND	ND	N/A	0.5GV
Vanadium	ND	ND	ND	<1.0-10	NS
Zinc	204	3.0 B	12 B	<10-2,000	2000 GV
Cyanide	ND	ND	ND	N/A	200

NOTE: Numbers in bold exceed standard.

(m) - Iron and manganese not to exceed 500 µg/l.
(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
N - Spiked sample recovery is not within control limits.
R - Duplicate analysis not within control limits.
(c) - NYSDEC Division of Water Technical and Operational Guidance Series (TO

W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
N/A - Not available.
ND - Not detected at analytical detection limit.
NS - No standard.
DUP - Duplicate sample analysis.

TABLE 3 (Page 1 of 9)

Project: Mohonk Road Site

Sampling Date: October 4 through 12, 1999

SAMPLE #/CONCENTRATION (µg/L)

Volatiles Low Concentration	Method Detection Limit	Water MRMW-1B 960837	Water MRMW-5B 960845	Water MRMW-6B 960848	Water MRMW-8B 960859	Water MRMW-9 960825	Water MRMW-9B 960841
Percent Moisture		0.0	0.0	0.0	0.0	0.0	0.0
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0
Chloromethane	10	U	U	U	U	U	U
Bromomethane	10	U J	U	U	U	U J	U
Vinyl Chloride	10	U	U	U	U	U	U
Chloroethane	10	U	2 J	U	U	U	U
Methylene Chloride	10	U	U J	U J	U J	U	U J
Acetone	10	U J	U J	U	U J	U J	U J
Carbon Disulfide	10	U	U	U	U	U	U
1,1-Dichloroethene	10	U	*250	7 J	U	U	U
1,1-Dichloroethane	10	U	50	2 J	U	U	U
Chloroform	10	U	2 J	U	U	U	U
1,2-Dichloroethane	10	U	5 J	U	U	U	U
2-Butanone	10	U J	U	U	U	U J	U
1,1,1-Trichloroethane	10	U	*2500	58	U	U	U
Carbon Tetrachloride	10	U	5 J	U	U	U	U
Bromodichloromethane	10	U	U	U	U	U	U
1,2-Dichloropropane	10	U	U	U	U	U	U
cis-1,3-Dichloropropene	10	U	U	U	U	U	U
Trichloroethene	10	U	130	U	U	U	U
Dibromochloromethane	10	U	U	U	U	U	U
1,1,2-Trichloroethane	10	U	5 J	U	U	U	U
Benzene	10	U	U	U	U	U	U
trans-1,3-Dichloropropene	10	U	U	U	U	U	U
Bromoform	10	U	U	U	U	U	U
4-Methyl-2-Pentanone	10	U J	U	U	1 J	U J	U
2-Hexanone	10	U J	U	U	U	U J	U
Tetrachloroethene	10	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	10	U	U	U	U	U	U
Toluene	10	U	U	U	U	U	U
Chlorobenzene	10	U	U	U	U	U	U
Ethylbenzene	10	U	U	U	U	U	U
Styrene	10	U	U	U	U	U	U
Total Xylenes	10	U	U	U	U	U	U
1,2-Dichloroethene (total)	10	U	2 J	U	U	U	U

* 27.8 X D/F

U - non-detected compound
B - compound detected in the associated Method Blank
J - estimated value
R - rejected compound

TABLE 3 (Page 2 of 9)

Project: Mohonk Road Site

Sampling Date: October 4 through 12, 1999

SAMPLE #/CONCENTRATION (µg/L)

Volatiles Low Concentration	Method Detection Limit	Water MRMW-4 961555	Water MRMW-5R 961551	Water MRMW-5RP 961563	Water MRMW-7R 961557	Water RIN-003 961537	Water TB-003 961560
Percent Moisture		0.0	0.0	0.0	0.0	0.0	0.0
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0
Chloromethane	10	U	U	U J	U	U	U
Bromomethane	10	U	U	U J	U	U	U
Vinyl Chloride	10	U	U	U J	U	U	U
Chloroethane	10	U	U	U J	U	U	U
Methylene Chloride	10	3 J	1 J	U J	U	U	U
Acetone	10	12 U J	U J	U J	U J	6 J	5 J
Carbon Disulfide	10	U	U	U J	U	U	U
1,1-Dichloroethene	10	*380 J	28	34 J	35	U	U
1,1-Dichloroethane	10	62	7 J	8 J	23	U	U
1,2-Dichloroethene (total)	10	8 J	U	U J	U	U	U
Chloroform	10	4 J	U	U J	U	U	U
1,2-Dichloroethane	10	11	U	U J	U	U	U
2-Butanone	10	U J	U J	U J	U J	U J	U J
1,1,1-Trichloroethane	10	*6800 J	*290 J	*330 J	*470	U	U
Carbon Tetrachloride	10	U	U	U J	U	U	U
Bromodichloromethane	10	U	U	U J	U	U	U
1,2-Dichloropropane	10	U	U	U J	U	U	U
cis-1,3-Dichloropropene	10	U	U	U J	U	U	U
Trichloroethene	10	*1600	16	18 J	4 J	U	U
Dibromochloromethane	10	U	U	U J	U	U	U
1,1,2-Trichloroethane	10	6 J	U	U J	U	U	U
Benzene	10	U	U	U J	U	U	U
trans-1,3-Dichloropropene	10	U	U	U J	U	U	U
Bromoform	10	U	U	U J	U	U	U
4-Methyl-2-Pentanone	10	U J	U J	U J	U J	U J	U J
2-Hexanone	10	U J	U J	U J	U J	U J	U J
Tetrachloroethene	10	U	U	U J	U	U	U
1,1,2,2-Tetrachloroethane	10	U	U	U J	U	U	U
Toluene	10	2 J	U	U J	U	U	U
Chlorobenzene	10	U	U	U J	U	U	U
Ethylbenzene	10	U	U	U J	U	U	U
Styrene	10	U	U	U J	U	U	U
Total Xylenes	10	U	U	U J	U	U	U
		*50 x D/F	*2.5 X D/F	*2 X D/F	*2.5 X D/F		

U - non-detected compound
B - compound detected in the associated Method Blank

[illegible]
at an estimated value
R - rejected compound

Project: Mohonk Road Site

Sampling Date: October 4 through 12, 1999

SAMPLE #/CONCENTRATION (µg/L)

Volatiles Low Concentration	Method Detection Limit	Water MRMW-10B 961169	Water MRMW-11B 961207	Water MRMW-11C 961168	Water MRMW-12B 961171	Water MRMW-14B 961170	Water MRMW-15B 961176
Percent Moisture		0.0	0.0	0.0	0.0	0.0	0.0
Dilution Factor		1.0	1.0	1.0	3.3	1.0	1.0
Chloromethane	10	U	U	U	U	U	U
Bromomethane	10	U	U	U	U	U	U
Vinyl Chloride	10	U	U	U	U	U	U
Chloroethane	10	U	U	U	U	U	U
Methylene Chloride	10	U	U	U	U	U	U
Acetone	10	17 U J	U	U	U	U	U
Carbon Disulfide	10	U	U	U	U	U	U
1,1-Dichloroethene	10	U	29	4 J	72	U	39
1,1-Dichloroethane	10	U	15	6 J	37	U	30
Chloroform	10	U	U	U	U	U	U
1,2-Dichloroethane	10	U	U	U	U	U	U
2-Butanone	10	U J	U J	U J	U J	U J	U J
1,1,1-Trichloroethane	10	U	190	120	380	U	*380
Carbon Tetrachloride	10	U	U	U	U	U	U
Bromodichloromethane	10	U	U	U	U	U	U
1,2-Dichloropropane	10	U	U	U	U	U	U
cis-1,3-Dichloropropene	10	U	U	U	U	U	U
Trichloroethene	10	U	11	6 J	23 J	U	4 J
Dibromochloromethane	10	U	U	U	U	U	U
1,1,2-Trichloroethane	10	U	U	U	U	U	U
Benzene	10	U	U	U	U	U	U
trans-1,3-Dichloropropene	10	U	U	U	U	U	U
Bromoform	10	U	U	U	U	U	U
4-Methyl-2-Pentanone	10	2 J	U	U	U	U	U
2-Hexanone	10	U	U	U	U	U	U
Tetrachloroethene	10	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	10	2 J	U	U	U	U	U
Toluene	10	U	U	U	U	U	U
Chlorobenzene	10	U	U	U	U	U	U
Ethylbenzene	10	U	U	U	U	U	U
Styrene	10	U	U	U	U	U	U
Total Xylenes	10	U	U	U	U	U	U
1,2-Dichloroethene (total)	10	U	U	U	U	U	U

*3.1 X D/F

U - non-detected compound

B - compound detected in the associated Method Blank

J - estimated value

[illegible]

R - rejected compound

Project: Mohonk Road Site

Sampling Date: October 4 through 12, 1999

SAMPLE #/CONCENTRATION (µg/L)

Volatiles Low Concentration	Method Detection Limit	Water ERT-1 961549	Water ERT-2 961542	Water ERT-3 961548	Water ERT-3P 961561	Water ERT-4 961556	Water MRMW-13B 961550
Percent Moisture		0.0	0.0	0.0	0.0	0.0	0.0
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0
Chloromethane	10	U	U	U	U	U	U
Bromomethane	10	U	U	U	U	U	U
Vinyl Chloride	10	U	U	U	U	U	U
Chloroethane	10	U	U	U	U	10	U
Methylene Chloride	10	2 J	1 J	U	U	4 J	2 J
Acetone	10	U J	U J	U J	U	U J	U J
Carbon Disulfide	10	U	U	U	U	U	U
1,1-Dichloroethene	10	170	5 J	11	10	*490 J	U
1,1-Dichloroethane	10	94	15	2 J	3 J	160	U
Chloroform	10	2 J	U	U	U	4 J	U
1,2-Dichloroethane	10	3 J	U	U	U	14	U
2-Butanone	10	U J	U J	U J	U J	U J	U J
1,1,1-Trichloroethane	10	*1400 J	*420	130	120	*6400 J	U
Carbon Tetrachloride	10	3 J	U	U	U	U	U
Bromodichloromethane	10	U	U	U	U	U	U
1,2-Dichloropropane	10	U	U	U	U	U	U
cis-1,3-Dichloropropene	10	U	U	U	U	U	U
Trichloroethene	10	100	12	52	47	*460 J	U
Dibromochloromethane	10	U	U	U	U	U	U
1,1,2-Trichloroethane	10	3 J	U	U	U	14	U
Benzene	10	U	U	U	U	U	U
trans-1,3-Dichloropropene	10	U	U	U	U	U	U
Bromoform	10	U	U	U	U	U	U
4-Methyl-2-Pentanone	10	U J	U J	U J	U J	U J	U J
2-Hexanone	10	U J	U J	U J	U J	U J	U J
Tetrachloroethene	10	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	10	U	U	U	U	U	U
Toluene	10	U	U	U	U	U	U
Chlorobenzene	10	U	U	U	U	U	U
Ethylbenzene	10	U	U	U	U	U	U
Styrene	10	U	U	U	U	U	U
Total Xylenes	10	U	U	U	U	U	U
1,2-Dichloroethene (total)	10	3 J	U	U	U	4 J	U
		*7.7 X D/F	*[illegible] X D/F			*33.3 X D/F	

U - non-detected compound

B - compound detected in the associated Method Blank

J - estimated value

R - rejected compound

Project: Mohonk Road Industrial Plant Site

Sampling Date: October 4 - 5, 1999

SAMPLE #/CONCENTRATION (UG/L)

Total Metals	Instrument Detection Limit (IDL)	Water MRMW-A 960840	Water MRMW-B 961172	Water MRMW-1B 960837	Water MRMW-10B 961169	Water MRMW-11B 961207	Water MRMW-11C 961168
Percent Solids		0.0	0.0	0.0	0.0	0.0	0.0
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0
Aluminum	35.1	U	U	39.5 B	U	U	U
Antimony	1.8	2.2 B	3.6 B	2.8 B	U	1.9 B	1.9 B
Arsenic	7.6	U	U	U	U	U	U
Barium	0.3	111 B	296	96.8 B	103 B	132 B	333
Beryllium	0.2	U	U	U	U	U	U
Cadmium	0.3	U	U	U	U	U	U
Calcium	10.9	124000	87600	159000	40900	89300	88800
Chromium	1.5	2.4 B	3.5 B	27.6	U	4.6 B	2.4 B
Cobalt	0.6	1.1 B	3.6 B	5.5 B	1.6 B	2.1 B	2.0 B
Copper	1.2	4.0 B	5.7 B	5.5 B	3.1 B	4.7 B	6.8 B
Iron	22.7	75.2 B	767	300	205	3760	6350
Lead	1.5	U	2.6 B	4.5	U	U	2.2 B
Magnesium	8.3	7990	12900	16400	7440	13400	12000
Manganese	0.2	1.8 B	94.7	106	221	60.7	64.3
Mercury	0.1	U	U	1.4	U	U	U
Nickel	1.1	2.5 B	4.4 B	24.2 B	1.5 B	3.6 B	2.2 B
Potassium	82.2	285 B	804 B	695 B	619 B	924 B	1810 B
Selenium	3.4	U	U	U	U	U	U
Silver	0.9	1.9 B	U	U	U	U	U
Sodium	655.0*	9880 J	9240 J	19500 J	3770 B	9220 J	15000 J
Thallium	2.5	U	U	U	U	U	U
Vanadium	0.8	1.5 B	1.7 B	1.4 B	1.3 B	1.6 B	1.5 B
Zinc	3.1	U J	U J	6.6 BJ	U J	U J	U J

norganic Qualifiers

U - non-detected compound
- estimated value
- between the instrument detection limit (IDL) and the contract required detection limit (CRDL)
- rejected compound

Project: Mohonk Road Industrial Plant Site

Sampling Date: October 6 - 7, 1999

SAMPLE #/CONCENTRATION (UG/L)

Total Metals	Instrument Detection Limit (IDL)	Water ERT-1 961549	Water ERT-2 961542	Water ERT-3 961548	Water ERT-4 961556	Water MRMW-13B 961550	Water MRMW-4 961555
Percent Solids		0.0	0.0	0.0	0.0	0.0	0.0
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0
Aluminum	35.1	234 J	73.0 BJ	36.9 BJ	U J	U J	301 J
Antimony	1.8	2.1 B	22.0 B	3.9 B	8.7 B	U	U
Arsenic	7.6	U	U	U	U	14.1	U
Barium	0.3	167 B	150 B	242	98.5 B	85.9 B	85.8 B
Beryllium	0.2	U	U	U	U	U	U
Cadmium	0.3	U	U	U	U	U	U
Calcium	10.9	106000	94300	98700	147000	43700	159000
Chromium	1.5	14.3	6.9 B	1.7 B	3.6 B	U	35.5
Cobalt	0.6	U	U	U	U	1.6 B	11.6 B
Copper	1.2	U	2.2 B	U	U	U	9.0 B
Iron	22.7	1110 J	941 J	50.1 BJ	27.8 BJ	1930 J	849 J
Lead	1.5	1.9 BJ	2.0 BJ	U J	U J	U J	1.7 BJ
Magnesium	8.3	14800	17300	16500	13800	8440	9890
Manganese	0.2	15.7	18.3	3.3 B	1.5 B	108	190
Mercury	0.1	U	U	U	0.11 B	U	0.10 B
Nickel	1.1	10.9 B	6.9 B	2.6 B	2.8 B	1.3 B	53.8 J
Potassium	82.2	694 B	595 B	490 B	450 B	794 B	766 B
Selenium	3.4	U	U	U	U	U	U
Silver	0.9	U	U	U	U	U	U
Sodium	655	11000	8800	14500	10100	19400	26000
Thallium	2.5	U	U	U	U	U	U
Vanadium	0.8	U	U	U	U	U	U
Zinc	3.1	U J	7.3 BJ	U J	U J	U J	19.3 BJ

Inorganic Qualifiers

- U - non-detected compound
- J - estimated value
- B - between the instrument detection limit (IDL) and the contract required detection limit (CRDL)
- R - rejected compound

Project: Mohonk Road Industrial Plant Site

Sampling Date: October 6 - 7, 1999

SAMPLE #/CONCENTRATION (UG/L)

Total Metals	Instrument Detection Limit (IDL)	Water MRMW-5R 961551		Water MRMW-7R 961557		Water RIN-003 961537		Water RIN-004 962193			
Percent Solids		0.0		0.0		0.0		0.0			
Dilution Factor		1.0		1.0		1.0		1.0			
Aluminum	35.1	304	J	R		U	J	U			
Antimony	1.8	U		3.5	B	2.6	B	5.3	B		
Arsenic	7.6	U		U		U		U			
Barium	0.3	241		160	B	U		2.0	B		
Beryllium	0.2	U		U		U		U			
Cadmium	0.3	U		U		U		U			
Calcium	10.9	82800		95700		67.4	B	U			
Chromium	1.5	12.8		15.0		U		U			
Cobalt	0.6	3.6	B	1.4	B	0.94	B	1.6	B		
Copper	1.2	U		14.7	B	2.1	B	3.6	B		
Iron	22.7	536	J	2090	J	28.1	BJ	33.1	B		
Lead	1.5	U	J	6.5	J	U	J	1.6	B		
Magnesium	8.3	8950		15600		26.5	B	26.4	B		
Manganese	0.2	49.8		116		U		0.35	B		
Mercury	0.1	U		U		U		U	J		
Nickel	1.1	14.2	B	12.4	B	U		U			
Potassium	82.2	487	B	1100	B	U		U			
Selenium	3.4	U		U		U		U			
Silver	0.9	U		U		U		U			
Sodium	655	11300		5700		U		U			
Thallium	2.5	U		U		U		U			
Vanadium	0.8	U		1.1	B	1.0	B	1.9	B		
Zinc	3.1	U	J	13.1	BJ	U	J	U	J		

Inorganic Qualifiers

U - non-detected compound
J - estimated value
B - between the instrument detection limit (IDL)
and the contract required detection limit (CRDL)
R - rejected compound

Project: Mohonk Road Industrial Plant Site

Sampling Date: October 4 - 5, 1999

SAMPLE #/CONCENTRATION (UG/L)

Total Metals	Instrument Detection Limit (IDL)	Water MRMW-12B 961171		Water MRMW-14B 961170		Water MRMW-15B 961176		Water MRMW-5B 960845		Water MRMW-6B 960848		Water MRMW-8B 961212	
Percent Solids		0.0		0.0		0.0		0.0		0.0		0.0	
Dilution Factor		1.0		1.0		1.0		1.0		1.0		1.0	
Aluminum	35.1	U		U		407		U		U		U	
Antimony	1.8	2.6	B	U		U		U		U		U	
Arsenic	7.6	U		U		U		U		U		U	
Barium	0.3	286		287		119	B	112	B	94.5	B	4350	
Beryllium	0.2	U		U		U		U		U		U	
Cadmium	0.3	U		U		U		U		U		U	
Calcium	10.9	87800		39100		80400		129000		118000		59700	
Chromium	1.5	2.5	B	U		15.8		U		U		U	
Cobalt	0.6	2.6	B	3.2	B	10.7	B	0.92	B	1.5	B	0.72	B
Copper	1.2	4.5	B	3.6	B	8.5	B	2.9	B	3.2	B	3.3	B
Iron	22.7	645		3080		1340		41.7	B	U		1260	
Lead	1.5	1.8	B	3.3		5.2		U		U		U	
Magnesium	8.3	13000		7960		14400		8380		15600		12200	
Manganese	0.2	90.6		248		22.2		1.0	B	0.65	B	318	
Mercury	0.1	U		U		U		U		U		U	
Nickel	1.1	3.6	B	U		12.5	B	1.4	B	2.4	B	U	
Potassium	82.2	791	B	1330	B	3460	B	272	B	594	B	2240	B
Selenium	3.4	U		U		U		U		U		U	
Silver	0.9	U		U		U		U		U		U	
Sodium	655.0	9160	J	18400	J	7250	J	10400	J	15200	J	53900	J
Thallium	2.5	U		U		U		U		U		U	
Vanadium	0.8	1.4	B	1.6	B	1.9	B	0.93	B	U		1.3	B
Zinc	3.1	U	J	U	J	U	J	U	J	U	J	7.9	BJ

Inorganic Qualifiers

U - non-detected compound
J - estimated value
B - between the instrument detection limit (IDL)
and the contract required detection limit (CRDL)
R - rejected compound

Project: Mohonk Road Industrial Plant Site

Sampling Date: October 4 - 5, 1999

SAMPLE #/CONCENTRATION (UG/L)

Total Metals	Instrument Detection Limit (IDL)	Water MRMW-9 960825		Water MRMW-9B 960841		Water RIN-001 960847		Water RIN-002 961209			
Percent Solids		0.0		0.0		0.0		0.0			
Dilution Factor		1.0		1.0		1.0		1.0			
Aluminum	35.1	74.7	B	425		U		U			
Antimony	1.8	U		3.7	B	U		U			
Arsenic	7.6	U		U		U		U			
Barium	0.3	42.9	B	199	B	0.88	B	0.66	B		
Beryllium	0.2	U		U		U		U			
Cadmium	0.3	U		U		U		U			
Calcium	10.9	21700		44500		193	B	193	B		
Chromium	1.5	7.8	B	8.5	B	U		U			
Cobalt	0.6	1.4	B	7.7	B	1.2	B	1.5	B		
Copper	1.2	2.9	B	5.8	B	4.6	B	4.4	B		
Iron	22.7	249		4540		77.4	B	80.4	B		
Lead	1.5	U		13.6		U		U			
Magnesium	8.3	3900	B	7810		39.9	B	53.1	B		
Manganese	0.2	74.6	B	484		2.6	B	8.1	B		
Mercury	0.1	U		U		U		U			
Nickel	1.1	6.0	B	9.4	B	1.9	B	3.3	B		
Potassium	82.2	1710	B	1900	B	U		U			
Selenium	3.4	U		U		U		U			
Silver	0.9	U		U		U		U			
Sodium	655	22900	J	15600	J	918	B	759	B		
Thallium	2.5	U		U		U		U			
Vanadium	0.8	1.2	B	2.3	B	1.5	B	1.3	B		
Zinc	3.1	U	J	20.5	J	U	J	14.0	BJ		

Inorganic Qualifiers

U - non-detected compound
J - estimated value
B - between the instrument detection limit (IDL) and the contract required detection limit (CRDL)
R - rejected compound

TABLE 4

GROUNDWATER VERTICAL DISTRIBUTION DATA SUMMARY

Mohonk Road Industrial Plant Site No. 356023

SAMPLE No:	MRMW-11B	MRMW-12B	MRMW-12B	MRMW-12B	MRPW-02	MRPW-02	MRPW-02	MRPW-02	MRPW-02	TRIP BLANK 1	TRIP BLANK 2	FIELD BLANK	NYSDEC[a] CLASS GA STANDARDS
SAMPLE DEPTH (ft):	181	40	60	80	107	127	147	167	187				
	[DL: 5:1]	[DL: 30:1]	[DL: 30:1]	[DL: 10:1]									
VOLATILE ORGANICS (µg/l)													
1,1- Dichloroethylene	100	69	78	43	7.1	5.0	3.5	3.8	3.6	ND	ND	ND	5
1,1-Dichloroethane	34	16	ND	19	ND	ND	ND	ND	ND	ND	ND	ND	5
1,1,1-Trichloroethane	460 e	820	620	260	41 e	31	24	26	24	ND	ND	ND	5
Trichloroethylene	34	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	5
Freon-113[b]	ND	ND	ND	ND	1.5	1.6	ND	0.92	0.52	ND	ND	ND	5
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	5

NOTE: BOLD DENOTES EXCEEDS STANDARDS.
(a) - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) 6/98.
(b) - Freon-113 is the same as 1,1,2-Trichloro-1,2,2-Trifluoroethane.
e - Estimated concentration; exceeds GC/MS calibration range.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.

TABLE 5

CONTAMINANT DISTRIBUTION IN AQUIFER

Mohonk Road Industrial Plant No 356-023

WELL NO.	ELEVATION OF FRACTURE(S) (ft)	DISTANCE FROM UNDERGROUND TANK (ft)	TOTAL VOCs (µg/L)	NOTES
MRPW-2	235.3	270	49.6	Fracture detected at 103-104 ft.below top of casing
	213.6		37.6	Fracture detected at 125 ft.below top of casing
	189.8		27.5	Fracture detected at 149 ft. below top of casing
	186.8		24.7	Fracture detected at 152 ft. below top of casing
	160.75 and 150.75		26.1	Fracture detected at 178 and 188 ft.below top of casing
MRMW-4	309.7	20	34,920	Elevation of bottom of overburden/bedrock interface well
MRMW-5B	291.3	100	4550	Elevation of bottom of bedrock well
MRMW-5R	220.13	225	1687[a]	Fracture detected at 90-92 ft. below grade
MRMW-11C	129.6	540	75[a]	Fracture detected at 155 ft. below grade
MRMW-11B	103.1	850	628	Fracture detected at 177 ft. below grade
MRMW-12B	221.2 and 219.2	1700	604	Fracture detected at 37 and 39 ft. below top ofcasing
	208.7 , 203.7 and 202.7		598	Fracture detected at 49.5, 54.5 and 55.5 ft. below top of casing

a - From May 1998 sampling.

TABLE 6 (Page 1 of 8)

TEST PIT DATA SUMMARY (July 1997)

Mohonk Road Industrial Plant Site No.: 356023

PARAMETER	MRTP01-01	MRTP01-02	MRTP01-03	DL MRTP01-03	MRTP01-04	MRTP01-05	MRTP02-01	RECOMMENDED SOIL CLEANUP OBJECTIVES(a)[f] (ppm)
Sample Depth (ft.)	11-12	6-7	6-7	6-7	9-10	5-6	3	
VOLATILE ORGANICS (mg/kg)					[DL: 5:1]			
Chloromethane	0.0040 J	ND	0.011 J	ND	ND	ND	ND	NS
Bromomethane	ND	ND	ND	ND	ND	ND	ND g	NS
Methylene chloride	0.0030 J	0.013 J	0.013 J	ND	ND	ND	ND	0.1
Acetone	0.017 b	0.14 b	0.085 b	ND	0.15 b d	ND	ND	0.2
1,1-Dichloroethane	ND	0.016 J	ND	ND	ND	ND	ND	0.2
1,2-Dichloroethylene (total)	ND	0.20	0.030 J	ND	0.071 d	0.0010 J	ND	0.3
1,1,1-Trichloroethane	ND	ND	ND	ND	0.0070 d J	ND	ND	0.8
Trichloroethylene	ND	ND	0.032 b J	ND	ND	ND	ND	0.7
Tetrachloroethylene	ND	0.24	**4.6 e**	**14 d**	0.057 d	0.0070 J	ND	1.4
Ethylbenzene	ND	0.012 J	ND	ND	0.0050 d J	ND	**25**	5.5
Xylene (total)	ND	0.047 J	ND	ND	0.032 d J	ND	**150 e**	1.2
SEMIVOLATILE ORGANICS (mg/kg)		[DL: 10:1]						
1,2,4-Trichlorobenzene	0.036 J	ND	ND	♦	ND	ND	ND	NS
Naphthalene	ND	1.1 d J	0.046 J	♦	ND	ND	ND	13
2-Methylnaphthalene	ND	3.9 d	0.041 J	♦	0.11 J	ND	ND	36.4
Phenanthrene	ND	ND	0.034 J	♦	ND	ND	ND	50.0***
Pyrene	0.042 J	ND	ND	♦	ND	ND	ND	50.0***
bis(2-Ethylhexyl)phthalate	ND	ND	ND	♦	ND	ND	1.0	50.0***

Note: Numbers in bold exceed standards.

*** - As per TAGM #4046, Total VOCs < 10 ppm, Total SVOCs < 500 ppm, and Individual SVOCs < 50 ppm.
♦ - Not analyzed.
f - Based on TOC of 5270 mg/kg.
(a) - NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM), 1/94.
b - Found in associated blanks.

d - Concentration recovered from diluted sample.
e - Estimated concentration; exceeds GC/MS calibration range.
g - Value considered estimated based on data validator's report (Appendix G).
J - Estimated concentration; compound present below quantitation limit.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.
NS - No standard.

TEST PIT DATA SUMMARY (July 1997)
Mohonk Road Industrial Plant Site No.: 356023

PARAMETER	[Blind Duplicate of MRTP02-01] MRTP02-06	[Blind DL Duplicate of MRTP02-01] MRTP02-06	MRTP02-02	MRTP02-03	MRTP02-04	MRTP02-05	RECOMMENDED SOIL CLEANUP OBJECTIVES(a) (ppm)
Sample Depth (ft.)	3	3	13.5	10	5.5	2	
VOLATILE ORGANICS (mg/kg)							
Bromomethane	ND	ND	0.0040 j	ND	ND	ND	NS
Acetone	0.75 j	ND	0.018 b	0.016 b	0.017 b	0.014 b	0.2
1,1-Dichloroethylene	ND	ND	0.0060 j	0.010 j	ND	0.0020 j	0.4
1,1-Dichloroethane	ND	ND	ND	0.0060 j	0.0030 j	0.0040 j	0.2
1,1,1-Trichloroethane	ND	ND	0.098	0.034	0.0070 j	0.019	0.8
Ethylbenzene	**41 e**	**61 e**	0.041	ND	0.0020 j	ND	5.5
Toluene	0.17 g j	ND	ND	ND	ND	ND	5.5
Xylene (total)	**210 e**	**570 d**	0.30	0.0040 j	0.013	0.0020 j	1.2
SEMIVOLATILE ORGANICS (mg/kg)							
bis(2-Ethylhexyl)phthalate	1.2	♦	0.018 j	ND	ND	ND	50.0***

Note: Numbers in bold exceed standards.
*** - As per TAGM #4046, Total VOCs < 10 ppm, Total SVOCs < 500 ppm, and Individual SVOCs < 50 ppm.
♦ - Not analyzed.
† - Based on TOC of 5270 mg/kg.
(a) - NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM), 1/94.

b - Found in associated blanks.
e - Estimated concentration; exceeds GC/MS calibration range.
g - Value considered estimated based on data validator's report (Appendix G).
j - Estimated concentration; compound present below quantitation limit.
DL - Diluted sample analysis.
ND - Not detected at analytical detection limit.
NS - No standard.

TABLE 6 (Page 3 of 8)

TEST PIT DATA SUMMARY (July 1997)
Mohonk Road Industrial Plant Site No.: 356023

PARAMETER	MRTP03-01[3]	MRTP04-01	MRTP04-02	MRTP05-01	MRTP06-01	RECOMMENDED SOIL CLEANUP OBJECTIVES(a)[2] (ppm)
Sample Depth (ft.)	-	4.3	2	3.5	2	
VOLATILE ORGANICS (mg/kg)						
Chloroethane	ND	0.002 j	ND	ND	ND	0.685
Acetone	ND	0.140 b	0.032 b	0.012 b j	0.012 b	0.072
1,1,1-Trichloroethane	ND	ND	ND	ND	0.0020 j	0.288
Trichloroethylene	ND	ND	ND	ND	0.0020 j	0.252
Methylene chloride	0.006 j b	ND	ND	ND	ND	0.036
SEMIVOLATILE ORGANICS (mg/kg)						
Phenanthrene	ND	ND	ND	0.046 j	ND	50
Fluoranthene	ND	ND	ND	0.071 j	ND	50
Pyrene	ND	ND	ND	0.063 j	ND	50
Benzo(a)anthracene	ND	ND	ND	0.040 j	ND	0.244 or MDL
Chrysene	0.099 j	ND	ND	0.050 j	ND	0.144
bis(2-Ethylhexyl)phthalate	ND	ND	ND	0.030 j	ND	50
Di-n-octylphthalate	ND	ND	ND	0.046 j	ND	50
Benzo(b)fluoranthene	ND	ND	ND	0.035 j	ND	0.397
Benzo(k)fluoranthene	ND	ND	ND	0.037 j	ND	0.397
Di-n-butylphthalate	0.036 j	ND	ND	ND	ND	2.92

Note: Numbers in bold exceed standards.

- *** - As per TAGM #4046, Total VOCs < 10 ppm, Total SVOCs < 500 ppm, and Individual SVOCs < 50 ppm.
- 2 - Based on TOC of 3605 mg/kg.
- 3 - Sample analyzed by NYSDEC Contract Laboratory (not validated).
- (a) - NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM), 1/94.
- b - Found in associated blanks.
- j - Estimated concentration; compound present below quantitation limit.
- ND - Not detected at analytical detection limit.
- MDL - Method detection limit.

TEST PIT DATA SUMMARY (July 1997)
Mohonk Road Industrial Plant Site No.: 356023

PARAMETER	MRTP06-02	MRTP07-01	MRTP08-01	MRTP09-01	RECOMMENDED SOIL CLEANUP OBJECTIVES(a)[2] (ppm)
Sample Depth (ft.)	6	3.5	4	3.5	
VOLATILE ORGANICS (mg/kg)					
Acetone	0.014 b	0.021 b	0.012	0.040 b	0.072
1,1-Dichloroethane	ND	ND	0.0010 J	0.0020 J	0.072
1,1,1-Trichloroethane	0.0040 J	0.010 J	0.0030 J	0.063	0.288
Trichloroethylene	0.012	0.0040 J	0.022	ND	0.252
SEMIVOLATILE ORGANICS (mg/kg)				[DL:4:1]	
Acenaphthene	ND	ND	ND	0.087 d J	50
Phenanthrene	ND	ND	ND	0.88 d J	50
Anthracene	ND	ND	ND	0.24 d J	50
Carbazole	ND	ND	ND	0.11 J	NS
Fluoranthene	ND	ND	ND	3.6 d	50
Pyrene	ND	ND	ND	4.4 d	50
Benzo(a)anthracene	ND	ND	ND	3.6 d	0.244 or MDL
Chrysene	ND	ND	ND	4.4 d	0.144
Benzo(b)fluoranthene	ND	ND	ND	8.4 d	0.397
Benzo(k)fluoranthene	ND	ND	ND	4.1 d	0.397
Benzo(a)pyrene	ND	ND	ND	5.3 d	0.061 or MDL
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	1.0 d J	1.154
Dibenzo(a,h)anthracene	ND	ND	ND	0.53 d J	0.014 or MDL
Benzo(g,h,i)perylene	ND	ND	ND	0.92 d J	50

Note: Numbers in bold exceed standards.
2 - Based on TOC of 3605 mg/kg.
(a) - NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM), 1/94.
b - Found in associated blanks.
d - Concentration recovered from diluted sample.
J - Estimated concentration; compound present below quantitation limit.
ND - Not detected at analytical detection limit.
MDL - Method detection limit.

TABLE 6 (Page 5 of 8)

TEST PIT DATA SUMMARY (July 1997)

Mohonk Road Industrial Plant Site No.: 356023

PARAMETER	MRTP01-01	MRTP01-02	MRTP01-03	MRTP01-04	MRTP01-05	NATIVE SOIL CONCENTRATIONS TYPICAL RANGE (n)	RECOMMENDED SOIL CLEANUP OBJECTIVE (b)	SOIL BACKGROUND(1)
Sample Depth (ft.)	11-12	6-7	6-7	9-10	5-6			
TAL METALS (mg/kg)								
Aluminum	6,520	7,330	8,420	7,630	8,180	10,000 - 300,000	SB	13,100
Antimony	ND N g	ND N g	ND N g	ND N g	ND N g	0.6 - 10	SB	ND
Arsenic	6.6	7.0	7.7	6.7	6.7	1.0 - 40	7.5 or SB	12.0
Barium	42	44	51	46	46	100 - 3,500	300 or SB	84.0
Beryllium	0.16 B	0.14 B	0.20 B	0.22 B	0.24 B	0.1 - 40	0.16 or SB	0.63
Cadmium	ND	ND	ND	ND	ND	0.01 - 7.0	1 or SB	ND
Calcium	46,000	28,600	9,240	33,400	1,550	100 - 400,000	SB	12,400
Chromium	9.8	11	12	11	12	5.0 - 3,000	10 or SB	16
Cobalt	7.2 B	8.1 B	9.5 B	8.1 B	9.7	1.0 - 40	30 or SB	12
Copper	15	19	18	19	61	2.0 - 100	25 or SB	20
Iron	16,500	16,900	19,900	17,200	19,900	7,000 - 550,000	2,000 or SB	23,400
Lead	9.4 N g	13 N g	12 N g	9.8 N g	11 N g	2.0 - 200	SB*	39
Magnesium	3,820	2,440	2,490	3,120	2,310	600 - 6,000	SB	3,620
Manganese	459 N g	601 N g	619 N g	418 N g	573 N g	100 - 4,000	SB	658
Mercury	ND g	ND g	ND g	ND g	ND g	0.01 - 0.08	0.1	0.06
Nickel	21	20	24	21	24	5.0 - 1,000	13 or SB	26
Potassium	919 B	1,100	1,010	1,270	843	400 - 30,000	SB	1,140
Selenium	ND	ND	ND	ND	ND	0.1 - 2.0	2 or SB	ND
Silver	ND N	ND N	ND N	ND N	ND N	0.1 - 5.0	SB	ND
Sodium	117 B	237 B	99 B	344 B	98	750 - 7,500	SB	111
Thallium	ND g	ND g	ND g	0.87 B g	ND g	0.1 - 0.8 (q)	SB	ND
Vanadium	11	14	14	14	14	20 - 500	150 or SB	20
Zinc	63	88	75	59	72	10 - 300	20 or SB	61
Cyanide	ND N r	ND N r	ND N r	ND N r	ND N r	N/A	**	

Note: Numbers in bold exceed standards.

- * - Background levels for lead range from 4 - 61 ppm in undeveloped, rural areas to 200 - 500 ppm in metropolitan or suburban areas or near highways.
- ** - Some forms of Cyanide are complex and stable while other forms are pH dependent and hence are very unstable. Site-specific form(s) of Cyanide should be taken into consideration when establishing soil cleanup objectives.
- (1) - From NYSDEC soil samples B52601 and B52606 (October 1996).
- (b) - NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM), 1/94.
- (n) - Dragun, J., The Soil Chemistry of Hazardous Materials.

- (q) - Bowan, H.J., Environmental Chemistry of the Elements.
- g - Value considered estimated based on data validator's report (Appendix G).
- r - Value rejected by data validator but usable to show magnitude
- B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
- N - Spiked sample recovery is not within control limits. of contaminated level (Appendix G).
- SB - Site background.
- ND - Not detected at analytical detection limit.
- N/A - Not available.

TABLE 6 (Page 6 of 8)

TEST PIT DATA SUMMARY (July 1997)

Mohonk Road Industrial Plant Site No.: 356023

PARAMETER	MRTP02-01	(Blind Duplicate of MRTP02-01) MRTP02-06	MRTP02-02	MRTP02-03	MRTP02-04	NATIVE SOIL CONCENTRATIONS TYPICAL RANGE (n)	RECOMMENDED SOIL CLEANUP OBJECTIVE (b)	SOIL BACKGROUND(1)
Sample Depth (ft.)	3	3	13.5	10	5.5			
TAL METALS (mg/kg)								
Aluminum	15,200	14,800	7,850	6,420	6,930	10,000 - 300,000	SB	13,100
Antimony	ND N g	ND N g	ND N g	ND N g	ND N g	0.6 - 10	SB	ND
Arsenic	5.4	5.7	7.1	7.7	8.0	1.0 - 40	7.5 or SB	12.0
Barium	54	52	41	38	35 B	100 - 3,500	300 or SB	64.0
Beryllium	0.43 B	0.39 B	0.28 B	0.14 B	0.22 B	0.1 - 40	0.16 or SB	0.63
Cadmium	ND	ND	ND	ND	ND	0.01 - 7.0	1 or SB	ND
Calcium	888 B	14,300	32,200	28,900	25,300	100 - 400,000	SB	12,400
Chromium	16	16	12	9.2	9.9	5.0 - 3,000	10 or SB	16
Cobalt	9.0 B	8.8 BN	8.0 B	8.3 B	8.5 B	1.0 - 40	30 or SB	12
Copper	11	11	16	14	16	2.0 - 100	25 or SB	20
Iron	19,700	20,600	19,500	16,000	17,700	7,000 - 550,000	2,000 or SB	23,400
Lead	17 N g	17 N g	13 N g	8.9 B g	11 N g	2.0 - 200	SB*	39
Magnesium	2,500	5,280	4,010	2,640	2,280	600 - 6,000	SB	3,620
Manganese	350 N g	387 N g	418 N g	507 N g	453 N g	100 - 4,000	SB	658
Mercury	ND g	ND g	ND g	ND g	ND g	0.01 - 0.08	0.1	0.06
Nickel	18	19	21	20	21	5.0 - 1,000	13 or SB	28
Potassium	780 B	761 B	974	680 B	805 B	400 - 30,000	SB	1,140
Selenium	ND	ND	ND	ND	ND	0.1 - 2.0	2 or SB	ND
Silver	ND N	ND N	ND N	ND N	ND N	0.1 - 5.0	SB	ND
Sodium	93 B	94 B	90	78 B	ND	750 - 7,500	SB	111
Thallium	ND g	ND g	ND g	ND g	ND g	0.1 - 0.8 (q)	SB	ND
Vanadium	23	22	13	11	12	20 - 500	150 or SB	20
Zinc	69	72	65	56	64	10 - 300	20 or SB	91
Cyanide	ND N r	ND N r	ND N r	ND N r	ND N r	N/A	**	-

Note: Numbers in bold exceed standards.

- * - Background levels for lead range from 4 - 61 ppm in undeveloped, rural areas to 200 - 500 ppm in metropolitan or suburban areas or near highways.
- ** - Some forms of Cyanide are complex and stable while other forms are pH dependent and hence are very unstable. Site-specific form(s) of Cyanide should be taken into consideration when establishing soil cleanup objectives.
- (1) - From NYSDEC soil samples B52601 and B52606 (October 1996).
- (b) - NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM), 1/94.
- (n) - Dragun, J., The Soil Chemistry of Hazardous Materials.
- (q) - Bowan, H.J., Environmental Chemistry of the Elements.
- g - Value considered estimated based on data validator's report (Appendix G).
- r - Value rejected by data validator but usable to show magnitude of contaminated level (Appendix G).
- B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
- N - Spiked sample recovery is not within control limits.
- SB - Site background.
- ND - Not detected at analytical detection limit.
- N/A - Not available.

TEST PIT DATA SUMMARY (July 1997)
Mohonk Road Industrial Plant Site No.: 356023

PARAMETER	MRTP02-05	MRTP03-013	MRTP04-01	MRTP04-02	MRTP05-01	NATIVE SOIL CONCENTRATIONS TYPICAL RANGE (n)	RECOMMENDED SOIL CLEANUP OBJECTIVE (b)	SOIL BACKGROUND(1)
Sample Depth (ft)	2	-	4.3	2	3.5			
TAL METALS (mg/kg)								
Aluminum	9,260	14,400	11,300	12,400	11,500	10,000 - 300,000	SB	13,100
Antimony	ND N g	ND N	ND N g	ND N g	ND N g	0.6 - 10	SB	ND
Arsenic	8.5	12 N	8.6	5.9	6.4	1.0 - 40	7.5 or SB	12.0
Barium	45	108	71	47	80	100 - 3,500	300 or SB	84.0
Beryllium	0.28 B	1.1 B	0.46 B	0.44 B	0.39 B	0.1 - 40	0.16 or SB	0.83
Cadmium	ND	ND	ND	ND	ND	0.01 - 7.0	1 or SB	ND
Calcium	3,370	2,890	1,350	878 B	1,680	100 - 400,000	SB	12,400
Chromium	12	18	15	16	17	5.0 - 3,000	10 or SB	18
Cobalt	11	13	10 B	8.9 B	9.9	1.0 - 40	30 or SB	12
Copper	19	33	23	20	40	2.0 - 100	25 or SB	20
Iron	20,800	31,400	25,000	21,200	21,700	7,000 - 650,000	2,000 or SB	23,400
Lead	12 N g	14 N	12 N g	12 N g	12 N g	2.0 - 200	SB*	39
Magnesium	2,460	3,510	2,650	2,790	2,740	600 - 6,000	SB	3,620
Manganese	582 N g	638	377 N g	200 N g	574 N g	100 - 4,000	SB	656
Mercury	ND g	ND	ND g	ND g	ND g	0.01 - 0.08	0.1	0.06
Nickel	24	38	31	22	27	5.0 - 1,000	13 or SB	28
Potassium	791 B	864 B	792 B	1,170	1,070	400 - 30,000	SB	1,140
Selenium	ND	ND N	ND	ND	ND	0.1 - 2.0	2 or SB	ND
Silver	ND N	4.4	ND N	ND N	ND N	0.1 - 5.0	SB	ND
Sodium	124 B	84 B	121 B	92 B	91 B	750 - 7,500	SB	111
Thallium	ND g	ND	ND g	ND g	ND g	0.1 - 0.8 (q)	SB	ND
Vanadium	14	22	18	21	18	20 - 500	150 or SB	20
Zinc	72	91	91	65	87	10 - 300	20 or SB	81
Cyanide	ND N r	NR	ND N r	ND N r	ND N r	N/A	**	

Note: Numbers in bold exceed standards.

* - Background levels for lead range from 4 - 61 ppm in undeveloped, rural areas to 200 - 500 ppm in metropolitan or suburban areas or near highways.

** - Some forms of Cyanide are complex and stable while other forms are pH dependent and hence are very unstable. Site-specific form(s) of Cyanide should be taken into consideration when establishing soil cleanup objectives.

(1) - From NYSDEC soil samples B52601 and B52606 (October 1996).
(b) - NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM), 1/94.
(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.

(q) - Bowen, H.J., Environmental Chemistry of the Elements.
g - Value considered estimated based on data validator's report (Appendix G).
r - Value rejected by data validator but usable to show magnitude
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
N - Spiked sample recovery is not within control limits. of contaminated level (Appendix G).
SB - Site background.
ND - Not detected at analytical detection limit.
N/A - Not available.

TEST PIT DATA SUMMARY (July 1997)

Mohonk Road Industrial Plant Site No.: 356023

PARAMETER	MRTP06-01	MRTP06-02	MRTP07-01	MRTP08-01	MRTP09-01	NATIVE SOIL CONCENTRATIONS TYPICAL RANGE (n)	RECOMMENDED SOIL CLEANUP OBJECTIVE (b)	SOIL BACKGROUND(1)
Sample Depth (ft)	2	6	3.5	4	3.5			
TAL METALS (mg/kg)								
Aluminum	17,900	12,600	21,600	7,430	18,500	10,000 - 300,000	SB	13,100
Antimony	ND N g	ND N g	ND N g	ND N g	ND N g	0.6 - 10	SB	ND
Arsenic	8.2	9.3	8.4	6.8	9.0	1.0 - 40	7.5 or SB	12.0
Barium	123	63	131	42	116	100 - 3,500	300 or SB	84.0
Beryllium	0.84 B	0.54 B	0.79 B	0.23 B	0.86 B	0.1 - 40	0.16 or SB	0.63
Cadmium	ND	ND	ND	ND	ND	0.01 - 7.0	1 or SB	ND
Calcium	1,650	1,520	18,200	27,400	3,540	100 - 400,000	SB	12,400
Chromium	24	18	29	11	24	5.0 - 3,000	10 or SB	16
Cobalt	15	8.6 B	15	6.0 B	10 B	1.0 - 40	30 or SB	12
Copper	26	20	27	17	30	2.0 - 100	25 or SB	20
Iron	31,800	26,600	35,700	18,200	33,500	7,000 - 550,000	2,000 or SB	23,400
Lead	16 N g	13 N g	16 N g	11 N g	16 N g	2.0 - 200	SB*	39
Magnesium	4,260	2,730	6,240	2,720	4,640	600 - 6,000	SB	3,620
Manganese	456 N g	330 N g	583 N g	450 N g	523 N g	100 - 4,000	SB	658
Mercury	ND g	ND g	ND g	ND g	ND g	0.01 - 0.08	0.1	0.06
Nickel	37	26	40	22	33	5.0 - 1,000	13 or SB	26
Potassium	1,770	1,180	3,040	866 B	1,620	400 - 30,000	SB	1,140
Selenium	ND	ND	ND	ND	ND	0.1 - 2.0	2 or SB	ND
Silver	ND N	ND N	ND N	ND N	ND N	0.1 - 5.0	SB	ND
Sodium	132 B	77 B	153 B	94 B	92 B	750 - 7,500	SB	111
Thallium	ND g	ND g	0.97 B g	ND g	ND g	0.1 - 0.8 (q)	SB	ND
Vanadium	27	21	34	12	29	20 - 500	150 or SB	20
Zinc	79	67	89	64	67	10 - 300	20 or SB	91
Cyanide	ND N r	ND N r	ND N r	ND N r	ND N r	N/A	**	-

Note: Numbers in bold exceed standards.

* - Background levels for lead range from 4 - 61 ppm in undeveloped, rural areas to 200 - 500 ppm in metropolitan or suburban areas or near highways.

** - Some forms of Cyanide are complex and stable while other forms are pH dependent and hence are very unstable. Site-specific form(s) of Cyanide should be taken into consideration when establishing soil cleanup objectives.

(1) - From NYSDEC soil samples B52601 and B52606 (October 1996).

(b) - NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM), 1/94.

(n) - Dragun, J., The Soil Chemistry of Hazardous Materials.

(q) - Bowan, H.J., Environmental Chemistry of the Elements.

g - Value considered estimated based on data validator's report (Appendix G).

r - Value rejected by data validator but usable to show magnitude

B - Value is less than the contract-required detection limit but greater than the instrument detection limit.

N - Spiked sample recovery is not within control limits of contaminated level (Appendix G).

SB - Site background.

ND - Not detected at analytical detection limit.

N/A - Not available.

TABLE 7

Paint Waste Area

Soil and Paint Waste Sampling Results

Sample	S-11		S-4		P-1		S-1	
Location	Paint waste exploratory trench		Paint waste exploratory trench		Paint waste exploratory trench		Paint waste exploratory trench, eastern paint waste disposal area	
Type	Soil from eastern sidewall		Paint product/fill mix		Paint product		Soil from northern trench	
Date	4/99		4/99		4/99		10/99	
COC	Conc (ug/kg)	MDL	Conc (ug/kg)	MDL	Conc (ug/kg)	MDL	Conc (ug/kg)	MDL
TCA	1.5	1.4	ND	93	ND	76	4.9	1.8
TCE	8.1	1.4	ND	93	204	76	ND	1.8
DCA	ND	5.6	ND	93	ND	76	ND	1.8
DCE	ND	1.4	ND	93	ND	76	ND	1.8
1,2 DCE	ND	1.4	ND	93	ND	76	ND	1.8
PCE	21	1.4	598	93	172	76	ND	1.8
Ethylbenzene	80	1.4	174,600	93	1,343,200	76	ND	1.8
Total Xylenes	18,350	1.4	827,000	93	6,132,000	76	ND	1.8

Complete sampling results from 4/99 are described in a June 28, 1999 report titled:
Trip Report, Exploratory Trenching at Mohonk Road Industrial Site

Complete sampling results from 10/99 are summarized in a Technical Memorandum titled:
Exploratory Trenching, Mohonk Road Industrial Site, dated October 25, 1999

TABLE 8

Page 1

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

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

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Subsurface Soil	1,2-Dichloroethene	ND	0.75	mg/kg	6/14	0.101	mg/kg	95% UCL
	Trichloroethene	ND	1.1	mg/kg	16/29	0.096	mg/kg	95% UCL
	Tetrachloroethene	ND	14	mg/kg	8/24	0.633	mg/kg	95% UCL
	Ethylbenzene	ND	41	mg/kg	7/25	3.68	mg/kg	95% UCL
	Xylenes	ND	210	mg/kg	10/25	20.8	mg/kg	95% UCL

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

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Fugitive Dust from Subsurface Soils During Excavation	1,2-Dichloroethene	ND	0.75	mg/kg	6/14	1.85E-05	mg/m^3	95% UCL
	Trichloroethene	ND	1.1	mg/kg	16/29	1.72E-05	mg/m^3	95% UCL
	Tetrachloroethene	ND	14	mg/kg	8/24	1.13E-04	mg/m^3	95% UCL
	Ethylbenzene	ND	41	mg/kg	7/25	6.60E-04	mg/m^3	95% UCL
	Xylenes	ND	210	mg/kg	10/25	3.74E-03	mg/m^3	95% UCL

TABLE 8

Page 2

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

Scenario Timeframe: Current/Future
Medium: Groundwater on the MRIP Property
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater	1,1-Dichloroethene	3 J	2200	ug/l	6/10	493	ug/l	95% UCL
	1,1,1,-Trichloroethane	5 J	19000	ug/l	8/10	4240	ug/l	95% UCL
	Trichloroethene	4 J	2500	ug/l	5/9	635	ug/l	95% UCL

Scenario Timeframe: Current/Future
Medium: Groundwater on the MRIP Property
Exposure Medium: Air

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater	1,1-Dichloroethene	3 J	2200	ug/l	6/10	715	mg/m^3	95% UCL
	1,1,1-Trichloroethane	5 J	19000	ug/l	8/10	4185	mg/m^3	95% UCL
	Trichloroethene	4 J	2500	ug/l	5/9	346	mg/m^3	95% UCL

TABLE 8

Page 3

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

Scenario Timeframe: Current/Future
Medium: Groundwater off the MRIP Property
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater	1,1-Dichloroethene	0.9	150	ug/l	54/71	7.2	ug/l	95% UCL
	1,1,1-Trichloroethane	0.6	840	ug/l	53/71	35.7	ug/l	95% UCL
	1,1-Dichloroethane	0.9	80	ug/l	54/70	3.9	ug/l	95% UCL
	Trichloroethene	<1	40	ug/l	30/70	1.4	ug/l	95% UCL

Scenario Timeframe: Current/Future
Medium: Groundwater off the MRIP Property
Exposure Medium: Air

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater	1,1-Dichloroethene	0.9	150	ug/l	54/71	10.45	mg/m^3	95% UCL
	1,1,1-Trichloroethane	0.6	840	ug/l	53/71	35.24	mg/m^3	95% UCL
	1,1-Dichloroethane	0.9	80	ug/l	54/70	1.25	mg/m^3	95% UCL
	Trichloroethene	<1	40	ug/l	30/70	0.76	mg/m^3	95% UCL

TABLE 8

Page 4

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

Scenario Timeframe: Current/Future
Medium: Groundwaterin the Nearfield Plume
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater	1,1-Dichloroethene	1	270	ug/l	119/128	93	ug/l	95% UCL
	1,1,1-Trichloroethane	0.6	4000	ug/l	125/128	708	ug/l	95% UCL
	1,1-Dichloroethane	0.6	130	ug/l	109/128	18	ug/l	95% UCL
	Trichloroethene	ND	95	ug/l	108/128	20	ug/l	95% UCL

Scenario Timeframe: Current/Future
Medium: Groundwaterin the Nearfield Plume
Exposure Medium: Air

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater	1,1-Dichloroethene	1	270	ug/l	119/128	0.42	mg/m^3	95% UCL
	1,1,1-Trichloroethane	0.6	4000	ug/l	125/128	3.2	mg/m^3	95% UCL
	1,1-Dichloroethane	0.6	130	ug/l	109/128	0.08	mg/m^3	95% UCL
	Trichloroethene	ND	95	ug/l	108/128	0.125	mg/m^3	95% UCL

Key

mg/m^3: milligram per cubic meter; parts per million
mg/kg: milligram per kilogram; parts per million
ug/l: micrograms per liter; parts per billion
ppm: parts per million
95% UCL: 95% Upper Confidence Limit
MAX: Maximum Concentration

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

The table presents the chemicals of concern (COCs) and exposure point concentration for each of the COCs detected in subsurface soil, air, and groundwater (*i.e.*, the concentration that will be used to estimate the exposure and risk from each COC in each media). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the exposure point concentration (EPC), and how the EPC was derived. The table indicates that volatile organic compounds, specifically, 1,2-dichloroethene, trichloroethene, tetrachloroethene, ethylbenzene, xylenes, 1,1-dichloroethene, and 1,1,1-trichloroethene are the most frequently detected COCs at the site. For all COCs, the 95% UCL was used as the exposure point concentration.

TABLE 9

Selection of Exposure Pathways

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Rationale for Selection/Exclusion of Exposure Pathway
Current/ Future	Subsurface Soil	Subsurface Soil	Subsurface Soil	Worker	Adult	Ingestion, Dermal Contact	Onsite	Worker exposure to subsurface contamination via digging activities.
		Air	Fugitive Dust	Worker	Adult	Inhalation	Onsite	Worker exposure to fugitive dust from subsurface contamination via digging activities.
Current/ Future	Ground-water on the MRIP Property	Groundwater	Aquifer - Tap Water	Resident (Future Only)	Adult	Ingestion, Dermal Contact	Onsite	Potential residential use with no restrictions on sinking groundwater wells.
				Resident (Future Only)	Child	Ingestion, Dermal Contact	Onsite	Potentail residential use with no restrictions on sinking groundwater wells.
				Worker (Current Only)	Adult	Ingestion	Onsite	Commercial area with no restrictions on sinking groundwater wells.
		Air	Water Vapors at Showerhead	Resident (Future Only)	Adult	Inhalation	Onsite	Potential residential use with no restrictions on sinking groundwater wells.
				Resident (Future Only)	Child	Inhalation	Onsite	Potential residential use with no restrictions on sinking groundwater wells.
Current/ Future	Ground-water off the MRIP Property	Groundwater	Aquifer - Tap Water	Resident	Adult	Ingestion, Dermal Contact	Onsite	Residential area with no restrictions on sinking groundwater wells.
				Resident	Child	Ingestion, Dermal Contact	Onsite	Residential area with no restrictions on sinking groundwater wells.
		Air	Water Vapors at Showerhead	Resident	Adult	Inhalation	Onsite	Residential area with no restrictions on sinking groundwater wells.
				Resident	Child	Inhalation	Onsite	Residential area with no restrictions on sinking groundwater wells.

Current/ Future	Ground-water in the Nearfield Plume	Groundwater	Aquifer - Tap Water	Resident	Adult	Ingestion	Onsite	Residential area with no restrictions on sinking groundwater wells.
				Resident	Child	Ingestion	Onsite	Residential area with no restrictions on sinking groundwater wells.
		Air	Water Vapors at Showerhead	Resident	Adult	Inhalation	Onsite	Residential area with no restrictions on sinking groundwater wells.
				Resident	Child	Inhalation	Onsite	Residential area with no restrictions on sinking groundwater wells.

Summary of Selection of Exposure Pathways

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

TABLE 10

Non-Cancer Toxicity Data Summary

-Ingestion, Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorption Efficiency (for Dermal)	Adjusted RfD (for Dermal)	Adjusted Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
1,1,1-Trichloroethane	Chronic	2E-02	mg/ kg-day	>50%	2E-02	mg/ kg-day	Liver	–	NCEA	10/99
1,1-Dichloroethene	Chronic	9E-03	mg/ kg-day	>50%	9E-03	mg/ kg-day	Liver	1000	IRIS	10/99
1,1-Dichloroethane	Chronic	1E-01	mg/ kg-day	>50%	1E-01	mg/ kg-day	NOAEL	1000	HEAST	10/99
Tetrachloroethene	Chronic	1E-02	mg/ kg-day	>50%	1E-02	mg/ kg-day	Liver	1000	IRIS	10/99
Ethylbenzene	Chronic	1E-01	mg/ kg-day	>50%	1E-01	mg/ kg-day	Liver, Kidney	1000	IRIS	10/99
Trichloroethene	Chronic	6E-03	mg/ kg-day	>50%	6E-03	mg/ kg-day	–	–	NCEA	10/99
Xylenes	Chronic	2E00	mg/ kg-day	>50%	2E00	mg/ kg-day	CNS	100	IRIS	10/99

-Inhalation

Chemical of Concern	Chronic/ Subchronic	Value Inhalation RfC	Inhalation RfD Units	Adjusted Inhalation RfD	Adjusted Inhalation RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfD: Target Organ	Dates of RfD
1,1,1-Trichloroethane	Chronic			2.86E-01	mg/kg-day	CNS	–	NCEA	10/99
1,1-Dichloroethene		NA							10/99
1,1-Dichloroethane	Chronic			1.4E-01	mg/kg-day	–		NCEA	10/99
Tetrachloroethene	Chronic			1.4E-01	mg/kg-day	–		NCEA	10/99
Ethylbenzene	Chronic			2.9E-01	mg/kg-day	Develop-mental	300	IRIS	10/99
Trichloroethene		NA							10/99
Xylenes		NA							10/99

Key

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

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in groundwater, subsurface soil, and air. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses. Inhalation reference doses are not available for 1,1-dichloroethene, trichloroethene, and xylenes.

TABLE 11

Page 1

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Current/Future
Receptor Population: Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	1,1-Dichloroethene	Liver	9.9E-07	--	6.2E-06	7.2E-06
			1,1,1-Trichloroethane	--	4.2E-07	--	2.6E-06	2.0E-06
			Tetrachloroethene	Liver	5.5E-06	--	3.48E-05	4.0E-05
			Ethylbenzene	Liver, Kidney	3.2E-06	--	2.02E-05	2.3E-05
			Xylenes	CNS	9.2E-07	--	5.7E-06	6.6E-06
	Air	Fugitive Dust	1,1-Dichloroethene	Liver	--	--	--	--
			1,1,1-Trichloroethane	--	--	3.3E-07	--	3.3E-07
			Tetrachloroethene	Liver	--	4.4E-06	--	4.4E-06
			Ethylbenzene	Liver, Kidney	--	1.3E-05	--	1.3E-05
			Xylenes	CNS	--	--	--	--
							Total Risk =	9.7E-05

TABLE 11

Page 2

Risk Characterization Summary - Noncarcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater on the MRIP Property	Groundwater	Aquifer - Tap Water	1,1-Dichloroethene	Liver	1.5E00	--	4.5E-02	1.5E00
			1,1,1-Trichloroethane	--	5.8E00	--	1.9E-01	6.0E00
			Trichloroethene	--	2.9E00	--	8.8E-02	3.0E00
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	Liver	--	--	--	--
			1,1,1-Trichloroethane	--	--	4.4E-01	--	4.4E-01
			Trichloroethene	--	--	--	--	--
							Total Risk =	1.1E+01

TABLE 11

Page 3

Risk Characterization Summary - Noncarcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater on the MRIP Property	Groundwater	Aquifer - Tap Water	1,1-Dichloroethene	Liver	3.5E00	--	8.4E-02	3.6E00
			1,1,1-Trichloroethane	--	1.4E01	--	3.5E-01	1.4E01
			Trichloroethene	--	6.8E00	--	1.6E-01	7.0E00
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	Liver	--	--	--	--
			1,1,1-Trichloroethane	--	--	2.0E00	--	2.0E00
			Trichloroethene	--	--	--	--	
							Total Risk =	2.7E01

TABLE 11

Page 4

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Current
Receptor Population: Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater on the MRIP Property	Groundwater	Aquifer - Tap Water	1,1-Dichloroethene	Liver	1.9E-01	--	--	1.9E-01
			1,1,1-Trichloroethane	--	7.5E-01	--	--	7.5E-01
			Trichloroethene	--	3.7E-01	--	--	3.7E-01
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	Liver	--	--	--	
			1,1,1-Trichloroethane	--	--	--	--	
			Trichloroethene	--	--	--	--	
							Total Risk =	1.3E00

TABLE 11
Page 5
Risk Characterization Summary - Noncarcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater off the MRIP Property	Groundwater	Aquifer - Tap Water	1,1-Dichloroethene	Liver	2E-02	--	6.6E-04	2.0E-02
			1,1-Dichloroethane	NOAEL	1E-03	--	1.8E-05	1.0E-03
			1,1,1-Trichloroethane	--	5E-02	--	1.6E-03	5.2E-02
			Trichloroethene	--	6E-03	--	1.9E-04	6.2E-03
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	Liver	--	--	--	--
			1,1-Dichloroethane	NOAEL	--	8.2E-04	--	8.2E-04
			1,1,1-Trichloroethane	--	--	3.68E-03	--	3.68E-03
			Trichloroethene	--	--	--	--	--
							Total Risk =	8.4E-02

TABLE 11

Page 6

Risk Characterization Summary - Noncarcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater off the MRIP Property	Groundwater	Aquifer - Tap Water	1,1-Dichloroethene	Liver	5E-02	--	1.2E-03	5.1E-02
			1,1-Dichloroethane	NOAEL	2.5E-03	--	3.3E-05	2.5E-03
			1,1,1-Trichloroethane	--	1.1E-01	--	2.9E-03	1.1E-01
			Trichloroethene	--	1.5E-02	--	3.6E-04	1.5E-02
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	Liver	--	--	--	--
			1,1-Dichloroethane	NOAEL	--	3.8E-03	--	3.8E-03
			1,1,1-Trichloroethane	--	--	1.7E-02	--	1.7E-02
			Trichloroethene	--	--	--	--	--
							Total Risk =	2.0E-01

TABLE 11

Page 7

Risk Characterization Summary - Noncarcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater in the Nearfield Plume	Groundwater	Aquifer - Tap Water	1,1-Dichloroethene	Liver	2.83E-01	–	–	2.83E-01
			1,1,1-Trichloroethane	–	6.93E-02	–	–	6.93E-02
			1,1-Dichloroethane	NOAEL	4.93E-03	–	–	4.93E-03
			Trichloroethene	–	–	–	–	–
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	Liver	–	–	–	–
			1,1,1-Trichloroethane	–	–	2.21E-02	–	2.21E-02
			1,1-Dichloroethane	NOAEL	–	–	–	–
			Trichloroethene	–	–	–	–	–
							Total Risk =	3.8E-01

TABLE 11

Page 8

Risk Characterization Summary - Noncarcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater in the Nearfield Plume	Groundwater	Aquifer - Tap Water	1,1-Dichloroethene	Liver	6.61E-01	--	--	6.61E-01
			1,1,1-Trichloroethane	--	1.62E-01	--	--	1.62E-01
			1,1-Dichloroethane	NOAEL	1.15E-02	--	--	1.15E-02
			Trichloroethene	--	--	--	--	--
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	Liver	--	--	--	--
			1,1,1-Trichloroethane	--	--	1.03E-01	--	1.03E-01
			1,1-Dichloroethane	NOAEL	--	--	--	--
			Trichloroethene	--	--	--	--	--
							Total Risk =	9.4E-01

Risk Characterization

Table 11 provides hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund (RAGS) states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse noncancer effects. For groundwater on the MRIP property, the estimated His of 11 and 27 for potential future adult and child residents, respectively, and 1.3 for current onsite workers indicate that the potential for adverse noncancer effects could occur from exposre to contaminated groundwater. HI values for receptors exposed to contaminants in the onsite subsurface soils, in groundwater off the MRIP property, and in the nearfield plume are all less than 1.

TABLE 12

Cancer Toxicity Data Summary

-Ingestion, Dermal Contact

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
1,1,1-Trichloroethane	NA		NA		D	IRIS	10/99
1,1-Dichloroethene	6.1E-01	$(mg/kg\text{-}day)^{-1}$	6.1E-01	$(mg/kg\text{-}day)^{-1}$	C	IRIS	10/99
1,1-Dichloroethane	NA		NA		C	IRIS	10/99
Tetrachloroethene	5.2E-02	$(mg/kg\text{-}day)^{-1}$	5.2E-02	$(mg/kg\text{-}day)^{-1}$	B2-C	IRIS	10/99
Ethylbenzene	NA		NA		D	IRIS	10/99
Trichloroethene	1.1E-02	$(mg/kg\text{-}day)^{-1}$	1.1E-02	$(mg/kg\text{-}day)^{-1}$	B2-C	IRIS	10/99
Xylenes	NA		NA		D	IRIS	10/99

-Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Cancer Slope Factor	Units	Weight of Evidence/Cancer Guideline Description	Source	Date
1,1,1-Trichloroethane	NA		NA		D	IRIS	10/99
1,1-Dichloroethene	5E-05	$(ug/m^3)^{-1}$	1.75E-01	$(mg/kg\text{-}day)^{-}$	C	IRIS	10/99
1,1-Dichloroethane	NA		NA		C	IRIS	10/99
Tetrachloroethene	NA		2E-03	$(mg/kg\text{-}day)^{-}$	B2-C	IRIS	10/99
Ethylbenzene	NA		NA		D	IRIS	10/99
Trichloroethene	NA		6E-03	$(mg/kg\text{-}day)^{-}$	B2-C	IRIS	10/99
Xylenes	NA		NA		D	IRIS	10/99

Key

NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA

EPA Group:

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

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in ground water, subsurface soil, and air. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 13

Page 1

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	Tetrachloroethene	8.3E-11	--	2.6E-10	3.4E-10
	Air	Fugitive Dust	Tetrachloroethene	--	1.8E-11	--	1.8E-11
						Total Risk =	3.6E-10

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater on the MRIP Property	Groundwater	Groundwater	1,1-Dichloroethene	3.5E-03	--	1.1E-04	3.6E-03
			Trichloroethene	8.2E-05	--	2.5E-06	8.5E-05
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	--	8.7E-04	--	8.7E-04
			Trichloroethene	--	3.9E-05	--	3.9E-05
						Total Risk =	4.6E-03

TABLE 13

Page 2

Risk Characterization Summary - Carcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater on the MRIP Property	Groundwater	Groundwater	1,1-Dichloroethene	1.6E-03	--	3.9E-05	1.6E-03
			Trichloroethene	3.8E-05	--	9.2E-07	3.9E-05
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	--	1.0E-03	--	1.0E-03
			Trichloroethene	--	4.5E-05	--	4.5E-05
						Total Risk =	2.7E-03

Scenario Timeframe: Current
Receptor Population: Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater on the MRIP Property	Groundwater	Groundwater	1,1-Dichloroethene	4.5E-04	--	--	4.5E-04
			Trichloroethene	1.1E-05	--	--	1.1E-05
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	--	--	--	--
			Trichloroethene	--	--	--	--
						Total Risk =	4.6E-04

TABLE 13

Page 3

Risk Characterization Summary - Carcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater off the MRIP Property	Groundwater	Groundwater	1,1-Dichloroethene	5.1E-05	--	4.3E-06	5.5E-05
			Trichloroethene	1.8E-07	--	5.5E-09	1.9E-07
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	--	1.3E-05	--	1.3E-05
			Trichloroethene	--	8.48E-08	--	8.48E-08
						Total Risk =	6.8E-05

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater off the MRIP Property	Groundwater	Groundwater	1,1-Dichloroethene	1.5E-05	--	5.7E-07	1.6E-05
			Trichloroethene	9.9E-08	--	2.02E-09	1.0E-07
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	--	2.4E-05	--	2.4E-05
			Trichloroethene	--	8.4E-08	--	8.4E-08
						Total Risk =	4.0E-05

TABLE 13

Page 4

Risk Characterization Summary - Carcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater in the Nearfield Plume	Groundwater	Groundwater	1,1-Dichloroethene	5.24E-04	--	--	5.24E-04
			Trichloroethene	2.07E-06	--	--	2.07E-06
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	--	1.1E-04	--	1.1E-04
			Trichloroethene	--	8.09E-07	--	8.09E-07
						Total Risk =	6.4E-04

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater in the Nearfield Plume	Groundwater	Groundwater	1,1-Dichloroethene	3.06E-04	--	--	3.06E-04
			Trichloroethene	1.21E-06	--	--	1.21E-06
	Air	Water Vapors at Showerhead	1,1-Dichloroethene	--	1.28E-04	--	1.28E-04
			Trichloroethene	--	9.44E-07	--	9.44E-07
						Total Risk =	4.4E-04

TABLE 13

Page 5

Risk Characterization Summary - Carcinogens

Key

— : Toxicity criteria are not available to quantitatively address this route of exposure.
N/A: Route of exposure is not applicable to this medium.

Risk Characterization

Table 13 provides carcinogenic risk estimates for the significant routes of exposure. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of exposure for each population, as well as the toxicity of the COCs. For groundwater on the MRIP property, the total risks are 4.6E-03, 2.7E-03, and 4.6E-04 for potential future adult and child residents and current onsite workers, respectively. Additionally, for groundwater in the nearfield plume, the total risks are 4.4E-04 for current and future child residents. The chemical in the groundwater (both on the MRIP property and in the nearfield plume) which contributes most significantly to the cumulative risks is 1,1-dichloroethene. The risk to the potential future adult resident indicates that if no clean-up action is taken, more than 4 additional cancers would be seen in a population of 10,000 people as a result of exposure to site-related COCs under the conditions described in the risk assessment.

All other estimated risks are within or below the acceptable level of E-06 toE-04.

TABLE 14
Contaminants of Concern (COCs) and Cleanup Levels

COC	Media	Cleanup Level	Unit	USEPA MCL	Basis for Cleanup Level
TCA	Groundwater	5	ppb	200	NYS Class GA GW
DCE	Groundwater	5	ppb	7	NYS Class GA GW
DCA	Groundwater	5	ppb	-	NYS Class GA GW
TCE	Groundwater	5	ppb	70	NYS Class GA GW
TCA	Soil	0.8	ppm		TAGM 4046
DCE	Soil	0.4	ppm		TAGM 4046
DCA	Soil	0.2	ppm		TAGM 4046
TCE	Soil	0.7	ppm		TAGM 4046
1,2-DCE	Soil	0.3	ppm		TAGM 4046
PCE	Soil	1.4	ppm		TAGM 4046
Xylenes	Soil	1.2	ppm		TAGM 4046
Ethylbenzene	Soil	5.5	ppm		TAGM 4046

Concentrations are given in ppb (µg/l) and mg/kg (ppm)

NYS Class GA GW   NYS Class GA Groundwater Standards
TAGM 4046   NYSDEC Technical and Administrative Guidance Memorandum #4046

TCA   1,1,1-trichloroethane
DCE   1,1-dichloroethene
DCA   1,1-dichloroethane
1,2-DCE   1,2-dichloroethene
TCE   trichloroethene
PCE   tetracholoethene

MCL   Maximum Contaminant Level

Table 15. (Page 1 of 2)

COST ESTIMATE FOR ALTERNATIVE AWS 3: WATER SUPPLY FROM THE CATSKILL AQUEDUCT

Mohonk Road Industrial Plant Site

ITEM	UNIT COST ($)		QUANTITY		COST (1998 $)*
CAPITAL COSTS					
A. Direct Costs					
Site Preparation					
Aquifer Testing for Backup Well Placement[1]	LS				$20,000
Treatability Study	LS				$25,000
Contractor Mobilization/Demobilization	LS				$250,000
Connection to Dewatering Chamber (DC)	LS				$27,000
Land Clearing	$30,400	/acre	1.0	acre	$30,000
Installation of Water Main and Raw Water Storage Tank					
6-in. Transmission Line DC to Raw Water Storage Tank					
Trench Excavation	$3.46	/lf	2,400	lf	$8,000
Rock Blasting	$22.34	/lf	2,400	lf	$54,000
Rock Disposal (20 Mi. Haul Round Trip)	$22.00	/lf	2,400	lf	$53,000
6-in. Ductile Iron Water Transmission Pipe	$22.98	/lf	2,400	lf	$55,000
Trench Backfilling and Compaction	$4.78	/lf	2,400	lf	$11,000
10,000 Gallon Cap. Elevated Raw Water Storage Tank	LS				$46,000
90 GPM Water Treatment Plant					
Equalization Tank	$27,000	/unit	1	unit	$27,000
Coagulation/Flocculation/Clarifier Unit	$112,000	/unit	1	unit	$112,000
Media Filtration Unit	$13,000	/unit	4	units	$52,000
Chlorination Unit	$27,000	/unit	1	unit	$27,000
Dewatering Unit & Filtrate Discharge System	$97,000	/unit	1	unit	$97,000
Pumping Station	$62,000	/station	1	unit	$62,000
Emergency Generator	$78,000	/unit	1	unit	$78,000
Treatment Building and Perimeter Fence	LS				$62,000
Finished Water Storage Tank					
150,000 Gal. Elevated Steel Water Storage Tank	$600,000	/tank	1	tank	$600,000
Installation of Water Main to Distribution System					
8-in. Transmission Line Storage Tank to Distribution					
Trench Excavation	$3.67	/lf	500	lf	$2,000
Rock Blasting	$23.65	/lf	500	lf	$12,000
Rock Disposal (20 Mi. Haul Round Trip)	$23.29	/lf	500	lf	$12,000
8-in. Ductile Iron Water Transmission Pipe	$24.33	/lf	500	lf	$12,000
Trench Backfilling and Compaction	$5.07	/lf	500	lf	$3,000
Installation of Distribution System					
8-in. Distribution System					
8-in. Ductile Iron Main Installation (From Above)	$80.01	/lf	28,000	lf	$2,240,000
Pavement Replacement	$8.78	/lf	28,000	lf	$246,000
Fire Hydrants (assume 500 ft spacing)	$1,164	/hydrant	56	hydrants	$65,000
1-in. Copper Pipe Connection for Property (50 lf)	$3,500	/property	155	properties	$543,000

COST ESTIMATE FOR ALTERNATIVE AWS: WATER SUPPLY FROM THE CATSKILL AQUEDUCT
Mohonk Road Industrial Plant Site

ITEM	UNIT COST ($)	QUANTITY	COST [a]
CAPITAL COSTS (Continued)			
Backup Well Water Supply System			
200-ft Deep Pumping Well (Install and Develop)	$30,000 /well	1 well	$30,000
10 hp Submersible Pump & Controls	$3,100 /pump	1 pump	$3,000
Land Acquisition for Well Field (1/2 acre) & Storage Shed	LS		$20,000
4-in. Transmission Line Well to Tee Connection			
Trench Excavation	$3.26 /lf	500 lf	$2,000
Rock Blasting	$21.03 /lf	500 lf	$11,000
Rock Disposal (20 Mi. Haul Round Trip)	$20.71 /lf	500 lf	$10,000
4-in. Ductile Iron Water Transmission Pipe	$21.63 /lf	500 lf	$11,000
Trench Backfilling and Compaction	$4.50 /lf	500 lf	$2,000
Well Closure			
Closure of Private Wells in the PWSA	$1,250 /well	155 wells	$194,000
		Subtotal	$5,114,000
B. Indirect Costs			
Engineering and Design @ 10%			$511,000
Legal and Administrative @ 15%			$767,000
Contingency @ 25%			$1,279,000
C. Residential GAC operation and monitoring	LS		$671,000 [e]
		Total	$8,342,000
O&M COSTS			
Electrical Usage (annual)	$0.11 /kWh	90,000 kWh/yr	$10,000 /yr
Maintenance of Pumps (Annual)	$400 /event	4 events/yr	$2,000 /yr
Full time Plant Operator.	$40,000 /operator	1 operator	$40,000 /yr
pH Control Chemicals	$500 /ton	1.0 tons/yr	$1,000 /yr
Coagulant/Flocculant Supply	$300 /ton	1.0 tons/yr	$1,000 /yr
Chlorine Supply	$2,400 /ton	1.0 tons/yr	$2,000 /yr
Off-site Sludge Disposal (Nonhazardous)	$120 /ton	32 tons/yr	$4,000 /yr
Quarterly Water Quality Monitoring	$500 /sample	4 samples	$2,000 /yr
NYCDEP Water Purchase Fee and Misc. [d]	LS		$12,000 /yr
Pump Replacement (5 yr life)	$6,700 /pump [c]	10 pumps	$34,000 [b]
		Annual Cost	$2,000 /yr
		TOTAL ANNUAL O&M COSTS	$76,000 /yr
PRESENT WORTH Based on a 30-yr life and a 5% interest rate			$9,510,000
			SAY: $ 9.5 million

1 -Assumes use of existing wells and one proposed pumping well.
a -Costs rounded to the nearest $1,000.
b -Present worth cost.
c -Average cost of various type pumps required.
LS -Lump Sum.
d -Based on Town Engineer's estimates documented in draft Plan, Map & Report.
e -Based on operation of 71 GAC systems and 57 residential well samples, 4 year present worth.

TABLE 16 (Page 1 of 2)

COST ESTIMATE FOR ALTERNATIVE GR 3: GROUNDWATER EXTRACTION AND EX SITU TREAMENT

Mohonk Road Industrial Plant Site

ITEM	UNIT COST ($)		QUANTITY	COST (1998 $)*
CAPITAL COSTS				
A. Direct Costs				
Site Preparation				
Contractor Mobilization/Demobilization	LS			$40,000
Installation and Development of Extraction Wells				
200-ft Deep Extraction Well	$15,500	/well	3 wells	$47,000
5 hp Submersible Pump & Controls	$4,400	/pump	3 pumps	$13,000
Connections From Extraction Wells to Force Main				
2-in. Pipe Connection				
Trench Excavation	$3.06	/lf	1,000 lf	$3,000
Rock Blasting	$19.71	/lf	1,000 lf	$20,000
Rock Disposal (20 Mi. Haul Round Trip)	$19.41	/lf	1,000 lf	$19,000
2-in. PVC Pipe	$11.69	/lf	1,000 lf	$12,000
Trench Backfilling and Compaction	$4.22	/lf	1,000 lf	$4,000
Pavement Replacement	$7.32	/lf	500 lf	$4,000
Main Installation Along Mohonk Rd. to Plant				
4-in. PVC Main				
Trench Excavation	$3.26	/lf	4,000 lf	$13,000
Rock Blasting	$21.03	/lf	4,000 lf	$84,000
Rock Disposal (20 Mi. Haul Round Trip)	$20.71	/lf	4,000 lf	$83,000
4-in. PVC Main & Cleanouts	$18.30	/lf	4,000 lf	$73,000
Trench Backfilling and Compaction	$4.50	/lf	4,000 lf	$18,000
Pavement Replacement	$7.78	/lf	4,000 lf	$31,000
120 GPM Water Treatment Plant				
Equalization/Coagulation/Flocculation Clarification/pH Control Units	$139,000	/unit	1 unit	$139,000
Dewatering Unit	$67,000	/unit	1 unit	$67,000
Air Stripping Unit	$60,000	/unit	1 unit	$60,000
10 hp Transfer Pump	$2,800	/pump	4 pumps	$11,000
Treatment Building and Perimeter Fence	LS			$62,000
Land Acquisition for Treatment Plant (1 acre)	LS			$15,000
Outfall Discharge to Rondout Creek				
6-in. PVC Discharge Pipe (From Above)	$67.79	/lf	100 lf	$7,000
Concrete Headwall	LS			$6,000
			Subtotal	$831,000

[illegible]

TABLE 16 (Page 2 of 2)

COST ESTIMATE FOR ALTERNATIVE GR 3: GROUNDWATER EXTRACTION AND EX SITU TREAMENT

Mohonk Road Industrial Plant Site

ITEM	UNIT COST ($)	QUANTITY	COST (1998 $)[a]
8. Indirect Costs			
Engineering and Design @ 15%			$125,000
Legal and Administrative @ 10%			$83,000
Contingency @ 25%			$208,000
		Total	$1,247,000
O&M COSTS			
Electricity for Pumps & Blower	$0.11 /kWh	260,000 kWh/yr	$29,000 /yr
Maintenance of Pumps & Blower	$2,900 /event	2 events/yr	$6,000 /yr
Half Time Operator for New Plant[b]	$20,000 /operator	1 operator/yr	$20,000 /yr
Supply of Oxidizing Agent	$9,200 /ton	3 tons/yr	$28,000 /yr
Coagulant Supply	$300 /ton	2 tons/yr	$1,000 /yr
Off-site Sludge Disposal (Nonhazardous)	$120 /ton	45 tons/yr	$5,000 /yr
System Influent/Effluent Monitoring	$400 /sample	24 samples/yr	$10,000 /yr
NTCRA Air Stripping System[c]	LS		$187,000 /yr
Long-term groundwater monitoring program			
Quarterly sampling of 6 wells for VOCs for first 5 years	$550 /sample	120 samples	$57,000
Annual sampling of 10 wells for VOCs for first 5 years	$550 /sample	50 samples	$24,000
Annual sampling of 16 wells for VOCs for next 25 years (present sum)	$550 /sample	400 samples	$97,000
Replacement of 2 wells every 3 years	$13,300 /well	18 wells	$124,000
Annual sampling of 5 surface water locations for VOCs for 30 years	$440 /location	150 locations	$34,000
Pump Replacement (5 yr life)	$3,200 /pump	35 pumps	$57,000
Blower Replacement (5 yr life)	$2,600 /blower	10 blowers	$13,000
		Subtotal of Periodic Costs	$406,000
		Annual Cost	$26,000 /yr
		TOTAL ANNUAL O&M COSTS	$312,000 /yr
PRESENT WORTH			
Based on a 30-yr life and a 5% interest rate			$6,043,000
			SAY: $6.0 million

a - Costs rounded to the nearest $1,000.
b - A half time operator was included with EPA's cost estimate for the NTCRA system. The additional cost presented here is for one full time operator to operate both treatment systems.
LS - Lump sum.

TABLE 17, Cost Estimate for Alternative SC 3: Excavation and Off-site Disposal

ITEM	UNIT COST($)	QUANTITY NYSDEC AREAS	QUANTITY PAINT WASTE AREA	ORIGINAL COST	ADDITIONAL COST	TOTAL COST
CAPITAL COSTS						
A. Direct Costs						
Site Preparation						
Contractor Mobilization/Demobilization	LS			$ 8,000		$ 8,000
Construction of Haul Road	LS			$ 5,000		$ 5,000
Excavation and Waste Handling						
Excavation of Outdoor Areas 1,2, and D-2	$ 46.25 /yd³	526 /yd³	300 /yd³	$ 24,000	$ 14,000	$ 28,000
Floor Demolition and Excavation of Indoor Area D-1	$ 458 /yd³	12 /yd³	0 /yd³	$ 5,000		$ 5,000
Confirmatory Sampling & VOC Analysis	$ 400 /sample	90 /samples	135 /samples	$ 36,000	$ 54,000	$ 90,000
Liners/Covers for Stockpiling Wastes	$ 0.22 /ft²	10,000 /ft²	15,000 /ft²	$ 2,000	$ 3,000	$ 5,000
Install Temporary Fence	$ 1.60 /lf	1000 /lf	0 /lf	$ 2,000	$ 3,000	$ 5,000
Waste Disposal						
Loading of Wastes onto Trucks	$ 6.94 /yd³	334 /yd³	300 /yd³	$ 2,000	$ 2,000	$ 4,000
Nonhazardous Soil						
Transportation to Waterloo, NY	$ 95 /yd³	334 /yd³	300 /yd³	$ 32,000	$ 29,000	$ 61,000
Landfilling at Seneca Meadows LF	$ 81 /yd³	334 /yd³	300 /yd³	$ 27,000	$ 24,000	$ 51,000
Hazardous Soil						
Transportation to Model City, NY	$ 225 /yd³	0 /yd³		$ 0		$ 0
Landfilling at Model City LF	$ 405 /yd³	0 /yd³		$ 0		$ 0
Site Restoration						
Additional Clean Backfill Required	$ 30 /yd³	334 /yd³	300 /yd³	$ 10,000	$ 9,000	$ 19,000
Backfill of Excavations	$ 18.40 /yd³	526 /yd³	300 /yd³	$ 10,000	$ 6,000	$ 16,000
Repair of Concrete Floor Indoors	$ 36.96 /ft²	150 /ft²		$ 6,000		$ 6,000
			SUBTOTAL—	$169,000	$144,000	$ 313,000
B. Indirect Costs						
Engineering an d Design @ 15%				$ 25,000	$22,000	$ 47,000
Legal and Administrative @ 10%				$ 17,000	$14,000	$ 31,000
Contingency @ 25%				$ 42,000	$36,000	$ 78,000
			TOTAL——	$ 253,000	$ 216,000	$ 469,000
O&M COSTS None						
PRESENT WORTH *Based on a 30-yr life and a 5% interest rate*				$ 253,000		$ 469,000

a - Costs rounded to the nearest $1,000
b - Waste assumed to have a density of 1.8 ton/yd3.
LS - Lump sum.

APPENDIX III

ADMINISTRATIVE RECORD INDEX

MOHONK ROAD INDUSTRIAL PLANT SITE
ADMINISTRATIVE RECORD
INDEX OF DOCUMENTS

2.0 REMOVAL RESPONSE

2.3 EE/CA Approval Memorandum (for non-time critical removals)

P. 200001-200105 Report: Engineering Evaluation/Cost Analysis Report, Mohonk Road Industrial Plant Site, High Falls, New York, February, 1999, prepared by the U.S. EPA Region II.

2.7 Correspondence

P. 200106-200116 Memorandum to File, from Mr. Dave Rosoff, On-Scene Coordinator, Removal Action Branch, U.S. EPA, Region II, re: Removal Site Evaluation for Mohonk Road Industrial Plant Site, Ulster County, New York, October 6, 1998.

3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P. 300001-300381 Report: New York State Superfund Contract, Remedial Investigation Report, Volume I, Mohonk Road Industrial Plant Site, prepared by Lawler, Matusky & Skelly Engineers LLP, prepared for the New York State Department of Environmental Conservation, September 1998.

P. 300382-300673 Report: New York State Superfund Contract, Remedial Investigation Report, Volume II, Appendices A-E and H-M, Mohonk Road Industrial Plant Site, prepared by Lawler, Matusky & Skelly Engineers LLP, prepared for the New York State Department of Environmental Conservation, September 1998.

P. 300674- 301533 Report: <u>New York State Superfund Contract, Remedial Investigation Report, Volume III, Appendix F, Mohonk Road Industrial Plant Site</u>, prepared by Lawler, Matusky & Skelly Engineers LLP, prepared for the New York State Department of Environmental Conservation, September 1998.

P. 301534- 302073 Report: <u>New York State Superfund Contract, Remedial Investigation Report, Volume IV, Appendix G, Mohonk Road Industrial Plant Site</u>, prepared by Lawler, Matusky & Skelly Engineers LLP, prepared for the New York State Department of Environmental Conservation, September 1998.

10.0 PUBLIC PARTICIPATION

10.1 Comments and Responses

P. 10.00001- 10.00005 Superfund Program Proposed Response Action, Mohonk Road Industrial Plant, High Falls, Ulster County, New York, EPA Proposes Interim Groundwater Action, prepared by the U.S. EPA Region II, February 1999.

P. 10.00006- 10.00006 The United States Environmental Protection Agency Invites Public Comment on Proposed Interim Groundwater Response Action for the Mohonk Road Industrial Plant Superfund Site, High Falls, Ulster County, New York, undated.

MOHONK ROAD INDUSTRIAL PLANT SITE
ADMINISTRATIVE RECORD UPDATE
INDEX OF DOCUMENTS

2.0 REMOVAL RESPONSE

2.1 Sampling and Analysis Plans

p. 200117- 200122 Report: U.S. EPA, Pollution Report, Mohonk Road Industrial Plant Site Removal Action, High Falls, Marbletown, Ulster County, New York, POLREP #1, prepared by Mr. David Rosoff, OSC, US EPA, and Mr. Louis DiGuardia, OSC, US EPA, Removal Action Branch, prepared for R. Salkie, ERRD-RAB, J. Witkowski, EPA-RAB; J. Malleck, EPA-SPB; L. Villatora, EPA, ORC; P. Hamblin, NYRB; J. Feldstein, EPA, ERRD; B. Bellow, 2CD; R. Cahill, 2CD-POB; R. Byrnes, 2OIG; T. Johnson, 5202G; M. Komoroske, NYSDEC; J. Helmeset, NYSDEC; G. Laccetti, NYSDOH; G. Mapstone, UCDOH; T. Jackson, Marbletown, August 17, 1998.

p. 200123- 200128 Report: U.S. EPA, Pollution Report, Mohonk Road Industrial Plant Site Removal Action, High Falls, Marbletown, Ulster County, New York, POLREP #2, prepared by Mr. David Rosoff, OSC, US EPA, and Mr. Louis DiGuardia, OSC, US EPA, Removal Action Branch, prepared for R. Salkie, ERRD-RAB; J. Witkowski, EPA-RAB; J. Malleck, EPA-SPB; L. Villatora, EPA, ORC; P. Hamblin, NYRB; J. Feldstein, EPA, ERRD; B. Bellow, 2CD; R. Cahill, 2CD-POB; R. Byrnes, 2OIG; T. Johnson, 5202G; M. Komoroske, NYSDEC; J. Helmeset, NYSDEC; G. Laccetti, NYSDOH; G. Mapstone, UCDOH; T. Jackson, Marbletown, September 3, 1999.

p. 200129- 200133 Report: U.S. EPA, Pollution Report, Mohonk Road Industrial Plant Site Removal Action, High Falls, Marbletown, Ulster County, New York, POLREP #3, prepared by Mr. David Rosoff, OSC, US EPA, and Mr. Louis DiGuardia, OSC, US EPA, Removal Action Branch, prepared for R. Salkie, ERRD-RAB; J. Witkowski, EPA-RAB; J. Malleck, EPA-SPB; L. Villatora, EPA, ORC; P. Hamblin, NYRB; J. Feldstein, EPA, ERRD; B. Bellow, 2CD; R. Cahill, 2CD-POB; R. Byrnes, 2OIG; T. Johnson, 5202G; M. Komoroske, NYSDEC; J. Helmeset, NYSDEC; T. Vickserson, NYSDEC; G. Laccetti, NYSDOH; G. Mapstone, UCDOH; T. Jackson, Marbletown, September 24, 1999.

P. 200134-200139 Report: U.S. EPA, Pollution Report, Mohonk Road Industrial Plant Site Removal Action, High Falls, Marbletown, Ulster County, New York, POLREP #4, prepared by Mr. David Rosoff, OSC, US EPA, and Mr. Louis DiGuardia, OSC, US EPA, Removal Action Branch, prepared for R. Salkie, ERRD-RAB; J. Witkowski, EPA-RAB; J. Malleck, EPA-SPB; L. Villatora, EPA, ORC; P. Hamblin, NYRB; J. Feldstein, EPA, ERRD; B. Bellow, 2CD; R. Cahill, 2CD-POB; R. Byrnes, 2OIG; T. Johnson, 5202G; M. Komoroske, NYSDEC; J. Helmeset, NYSDEC; T. Vickserson, NYSDEC; G. Laccetti, NYSDOH; G. Mapstone, UCDOH; T. Jackson, Marbletown, October 22, 1999.

P. 200140-200144 Report: U.S. EPA, Pollution Report, Mohonk Road Industrial Plant Site Removal Action, High Falls, Marbletown, Ulster County, New York, POLREP #5, prepared by Mr. David Rosoff, OSC, US EPA, and Mr. Louis DiGuardia, OSC, US EPA, Removal Action Branch, prepared for R. Salkie, ERRD-RAB; J. Witkowski, EPA-RAB; J. Malleck, EPA-SPB; L. Villatora, EPA, ORC; P. Hamblin, NYRB; J. Feldstein, EPA, ERRD; B. Bellow, 2CD; R. Cahill, 2CD-POB; R. Byrnes, 2OIG; T. Johnson, 5202G; M. Komoroske, NYSDEC; J. Helmeset, NYSDEC; T. Vickserson, NYSDEC; G. Laccetti, NYSDOH; G. Mapstone, UCDOH; T. Jackson, Marbletown, November 30, 1999.

P. 200145-200151 Report: U.S. EPA, Pollution Report, Mohonk Road Industrial Plant Site Removal Action, High Falls, Marbletown, Ulster County, New York, POLREP #6, prepared by Mr. David Rosoff, OSC, US EPA, and Mr. Louis DiGuardia, OSC, US EPA, Removal Action Branch, prepared for R. Salkie, ERRD-RAB; J. Witkowski, EPA-RAB; J. Malleck, EPA-SPB; L. Villatora, EPA, ORC; P. Hamblin, NYRB; J. Feldstein, EPA, ERRD; B. Bellow, 2CD; R. Cahill, 2CD-POB; R. Byrnes, 2OIG; T. Johnson, 5202G; M. Komoroske, NYSDEC; J. Helmeset, NYSDEC; T. Vickserson, NYSDEC; G. Laccetti, NYSDOH; A. Dumas, UCDOH; T. Jackson, Marbletown, December 21, 1999.

P. 200152- 200157 Report: U.S. EPA, Pollution Report, Mohonk Road Industrial Plant Site Removal Action, High Falls, Marbletown, Ulster County, New York, POLREP #7, prepared by Mr. David Rosoff, OSC, US EPA, and Mr. Louis DiGuardia, OSC, US EPA, Removal Action Branch, prepared for R. Salkie, ERRD-RAB; J. Witkowski, EPA-RAB; J. Malleck, EPA-SPB; L. Mc David, EPA, ORC; P. Hamblin, NYRB; J. Feldstein, EPA, ERRD; M. Cervantes, 2CD; R. Cahill, 2CD-POB; R. Byrnes, 2OIG; T. Johnson, 5202G; M. Komoroske, NYSDEC; J. Helmeset, NYSDEC; T. Vickserson, NYSDEC; G. Laccetti, NYSDOH; A. Dumas, UCDOH; T. Jackson, Marbletown, February 4, 2000.

2.2 Sampling and Analysis Data/Chain of Custody Forms

P. 200158- 200212 Report: New York State Superfund Contract Immediate Investigation Work Assignment, Data Report, Mohonk Road Industrial Plant Immediate Investigation Work Assignment, prepared by Lawler, Matusky & Skelly Engineers, LLP, prepared for New York State Department of Environmental Conservation, January 1997.

P. 200213- 200265 Report: New York State Superfund Contract Immediate Investigation Work Assignment, Data Report, Mohonk Road Industrial Plant Immediate Investigation Work Assignment No. 2, prepared by Lawler, Matusky & Skelly Engineers, LLP, prepared for New York State Department of Environmental Conservation, September 1997.

P. 200266- 200286 Memorandum to Mr. Greg Powell, U.S. EPA/ERTC Work Assignment Manager, from Mr. Ken Woodruff, REAC Task Leader, and Mr. George Prior, Engineer (Weston), through Mr. Edward F. Gilardi, REAC Program Manager, re: Technical Memorandum - Assessment of Surface Water Discharge Options, Mohonk Road Industrial Site, High Falls, New York, November 3, 1998.

p.	200287- 200303	Memorandum to Mr. Greg Powell, U.S. EPA Work Assignment Manager, from Mr. Ken Woodruff, REAC Task Leader, Roy F. Weston, Inc., re: Technical Memorandum, Investigation of Soil Infiltration and Bedrock Injection Capacity for Disposal of Treated Groundwater, Mohonk Road Site, High Falls, New York, December 29, 1998.
p.	200304- 200322	Memorandum to Mr. Greg Powell, U.S. EPA Work Assignment Manager, from Mr. Ken Woodruff, REAC Task Leader, through Mr. Edward F. Gilardi, REAC Program Manager, Roy F. Weston, Inc., re: Technical Memorandum, Overland Flow Test for Disposal of Treated Groundwater, Mohonk Road Industrial Plant Site, High Falls, New York, January 6, 1999.
p.	200323- 200379	Memorandum to Mr. Greg Powell, U.S. EPA Work Assignment Manager, from Mr. Ken Woodruff, REAC Task Leader, through Mr. Edward F. Gilardi, REAC Program Manager, Roy F. Weston, Inc., re: Technical Memorandum, Results of Aquifer Pumping Tests, Mohonk Road Industrial Plant Site, High Falls, New York, February 25, 1999.
P.	200380- 200397	Letter to Mr. David Rosoff, Task Monitor, U.S. EPA, Removal Action Branch, from Mr. Thomas O'Neill, Site Project Manager, Roy F. Weston, Inc., re: Sampling Trip Report-Mohonk Road Site, April 8, 1999 (Attachment: Sampling Trip Report).
P.	200398- 200439	Report: <u>Analytical Report, Mohonk Road Site, High Falls, New York</u>, prepared by Roy F. Weston, Inc., prepared for U.S. EPA, May 1999.
P.	200440- 200478	Memorandum to Mr. David Rosoff, OSC, Response and Prevention Branch, U.S. EPA Region II, from Mr. David Rosenberg, Data Reviewer, START Region II, Roy R. Weston, Inc., re: Mohonk Road Industrial Plant Site, High Falls, New York, Data Validation Assessment, June 3, 1999.
P.	200479-	Memorandum to Mr. Greg Powell, U.S. EPA/ERTC

200511 Work Assignment Manager, from Mr. Ken Woodruff, REAC Task Leader, through Mr. Edward F. Gilardi, REAC Program Manager, Roy F. Weston, Inc., re: Technical Memorandum, Wells Installation and Pumping Tests Results, Mohonk Road Industrial Plant Site, High Falls, New York, W.A. # 3-407, June 11, 1999.

P. 200512- 200555 Memorandum to Mr. Greg Powell, U.S. EPA Work Assignment Manager, from Mr. Terrence Johnson, REAC Senior Groundwater Modeler, through Mr. Ken Woodruff, REAC Task Leader, Roy F. Weston, Inc., re: Technical Memorandum, Groundwater Modeling Evaluation of Well Geometry and Extraction/ Injection Rates for Dissolved Plume Containment and Recovery at the Mohonk Road Site, High Falls, New York, June 15, 1999.

P. 200556- 200566 Memorandum to Mr. David Rosoff, OSC, Removal Action Branch, U.S. EPA Region II, from Smita Sumbaly, Inorganic Data Reviewer, START Region II, Roy F. Weston, Inc., re: Mohonk Road Industrial Site Data Validation Assessment, June 21, 1999.

P. 200567- 200579 Memorandum to Mr. Greg Powell, U.S. EPA/ERTC Work Assignment Manager, from Mr. John Williams, Weston Geophysicist, through Mr. Ken Woodruff, REAC Task Leader and Mr. Edward F. Gilardi, REAC Program Manager, Roy F. Weston, Inc., re: Technical Memorandum, Geophysical Investigations, Mohonk Road Industrial Site, High Falls, New York, W.A. # 3-407, June 24, 1999.

P. 200580- 200644 Memorandum to Mr. Greg Powell, U.S. EPA/ERTC Work Assignment Manager, from Mr. Ken Woodruff, REAC Task Leader, Roy F. Weston, Inc., re: Trip Report, Exploratory Trenching at Mohonk Road Industrial Site, High Falls, N.Y., W.A. #3-407, June 28, 1999.

P. 200645- 200646 Memorandum to Mr. Patrick Hamblin, Remedial Project Manager, U.S. EPA, from Mr. Ken Woodruff, Geologist, REAC, re: Correction of Table 4, Technical Memorandum, 11 June 1999, (Attached), 29 July 1999.

P. 200647-200654 Memorandum to Mr. Greg Powell, U.S. EPA Work Assignment Manager, from Mr. Ken Woodruff, REAC Task Leader, Lockheed Martin Technology Services Group, re: Technical Memorandum, Geophysical Survey, Mohonk Road Industrial Park, High Falls, NY, W.A. #0-044, August 31, 1999.

P. 200655-200777 Memorandum to Mr. Greg Powell, U.S. EPA/ERTC Work Assignment Manager, from Mr. Ken Woodruff, REAC Task Leader, Lockheed Martin Technology Services Group, re: Technical Memorandum, Groundwater Treatability Results, Mohonk Road Industrial Site, High Falls, NY, W.A. #0044, October 8, 1999.

P. 200778-200896 Letter to Mr. David Rosoff, U.S. EPA, Removal Action Branch, from Mr. John R. Brennan, Project Manager, Roy F. Weston, Inc., re: Sampling Trip Report, Mohonk Road Industrial Plant Site, Village of High Falls, Marbletown, New York, October 25, 1999. (Attachment: Sampling Trip Report).

P. 200897-200972 Memorandum to Mr. Greg Powell, U.S. EPA/ERTC Work Assignment Manager, from Mr. Ken Woodruff, REAC Geologist, Lockheed Martin Technology Services Group, re: Exploratory Trenching, Mohonk Road Industrial Site, High Falls, New York, W.A. #0044, October 25, 1999.

P. 200973-200992 Memorandum to Mr. Greg Powell, U.S. EPA/ERTC Work Assignment Manager, from Mr. Ken Woodruff, REAC Task Leader, Lockheed Martin Technology Services Group, re: Borehole Geophysical Logging, Mohonk Road Industrial Site, W.A. #0044, October 29, 1999.

P. 200993-201007 Memorandum to Mr. David Rosoff, OSC, Removal Action Branch, U.S. EPA Region II, from Smita Sumbaly, Inorganic Data Reviewer, START Region II, re: Mohonk Road Industrial Plant Site Data Validation Assessment, November 18, 1999.

P. 201008-201094 Report: Mohonk Road Industrial Plant Site Groundwater & Drinking Water Sampling event, prepared by Mr. David Rosoff, OSC, U.S. EPA, December 1999. (Note: This document is

Confidential. It is located at the U.S. EPA Superfund Records Center, 290 Broadway, 18th floor, New York, NY.)

P. 201095-201130 Memorandum to Mr. David Rosoff, OSC, Removal Action Branch, U.S. EPA Region II, from Smita Sumbaly, Organic Data Reviewer, START Region II, re: Mohonk Road Industrial Plant Site, Data Validation Assessment, December 20, 1999.

P. 201131-201136 Memorandum to Mr. David Rosoff, OSC, Response and Prevention Branch, U.S. EPA Region II, from Mr. David Rosenberg, Data Reviewer, START Region II, Roy R. Weston, Inc., re: Mohonk Road Industrial Plant Site, High Falls, New York, January 28, 2000.

P. 201137-201182 Memorandum to Mr. David Rosoff, OSC, Response and Prevention Branch, U.S. EPA Region II, from Mr. David Rosenberg, Data Reviewer, START Region II, Roy R. Weston, Inc., re: Mohonk Road Industrial Plant Site, High Falls, New York, January 28, 2000. (Note: This document is Confidential. It is located at the U. S. EPA Superfund Records Center, 290 Broadway, 18th floor, New York, NY.)

P. 201183-201263 Report: Comprehensive Mohonk Road Industrial Plant Site Residential Database, prepared by Mr. David Rosoff, OSC, US EPA, February 2000. (Note: This document is Confidential. It is located at the U.S. EPA, Superfund Records Center, 290 Broadway, 18th Floor, New York, NY.)

2.3 EE/CA Approval Memorandum (for non-time-critical removals)

P. 201264-201268 Memorandum to Mr. Richard L. Caspe, Director, Emergency and Remedial Response Division, U. S. EPA, from Mr. David Rosoff, On-Scene Coordinator, and Mr. Louis DiGuardia, On-Scene Coordinator, Removal Action Branch, through Mr. Richard C. Salkie, Chief, Removal Action Branch, re: Documentation of concurrence with the preparation of an Engineering Evaluation/Cost Analysis in support of a CERCLA Non-Time Critical Removal Action at the Mohonk Road Industrial Plant Site, High Falls, Ulster County, New York, June 4, 1999.

2.4 EE/CA

P.	201269-201275	Report: Interim Report #1, Environmental Impact Assessment for Proposed Effluent Discharge Pipeline Routing from the Mohonk Road Industrial Plant Site, Coxing Kill Discharge Route, undated.
P.	201276-201298	Letter to Mr. Dave Rosoff, On-Scene Coordinator, U.S. EPA, Region II-Response and Prevention Branch, from Mr. Dan Crouse, Site Project Manager, Roy F. Weston, Inc., re: Engineering evaluation of the proposed effluent discharge to the Coxing Kill Creek the Mohonk Road Industrial Plant Site, September 29, 1999.
P.	201299-201373A	Report: Mohonk Road Industrial Plant Effluent Discharge Pipeline Specifications, Town of Marbletown, New York, prepared by Roy F. Weston of New York, prepared for U.S. EPA, Region II, September 1999.
P.	201374-201617	Report: Interim Report #2, Ecological Evaluation of the Proposed Effluent Discharge to the Coxing Kill Creek From the Mohonk Road Industrial Plant Site, prepared by Mr. Richard Henry, Aquatic Biologist, Response Engineering and Analytical Contract, prepared for Royal J. Nadeau, Ph.D., Associate Director, Environmental Response Team Center, Office of Emergency & Remedial Response, U.S. Environmental Protection Agency, October 1999.

2.5 Action Memorandum

P.	201618-201788	Memorandum to Mr. Richard L. Caspe, Emergency and Remedial Response Division, U. S. EPA, from Mr. David Rosoff, On-Scene Coordinator, and Mr. Louis DiGuardia, On-Scene Coordinator, Removal Action Branch, re: Request for Funding to Conduct a CERCLA Non-Time Critical Removal Action at the Mohonk Road Industrial Plant Site, High Falls,New York, June 4, 1999.

2.7 Correspondence

p.	201789-201790	Letter to Mr. Jim Donahue, Commissioner of Highways and Bridges, Ulster County Public Works Department, from Mr. David Rosoff, OSC, U.S. EPA, Region II, re: Design Plans and Specifications for the Installation of the Underground Effluent Discharge Pipeline Along Mohonk Road for the Mohonk Road Superfund Site in Marbletown, Ulster County, New York, September 20, 1999.
P.	201791-201791	Letter to Mr. David Rosoff, U.S. EPA, Region II, from Mirces Catona, Asst. Civil Engineering, Department of Highways and Bridges, County of Ulster, re: Underground Effluent Discharge Pipeline Installation, Mohonk Road (Co. Rd. #95), Town of Marbletown, October 1, 1999.

3.0 REMEDIAL INVESTIGATION

3.1 Sampling and Analysis Plans

p.	302074-302101	Plans: Heat Transfer Analysis for Mohonk Road Lagoon, prepared by Earth Tech, Inc., prepared for Mr. Dave Rosoff, OSC, EPA, February 7, 2000.

3.3 Work Plans

p.	302102-302159	Letter to Mr. David Rosoff, Response and Prevention Branch, U.S. EPA, from Mr. John F. Brennan, Project Manager, Roy F. Weston, Inc., re: Quality Assurance Project Plan - The Mohonk Road Industrial Plant, November 23, 1999. (Attachment: Sampling QA/QC Work Plan). (Note: This document is Confidential. It is located at the U.S. EPA Superfund Records Center, 290 Broadway, 18th floor, New York, NY.)

3.4 Remedial Investigation Reports

p.	302160-302200	Reports: Phase IA Literature Review and Archeological Sensitivity Assessment, Mohonk Road Industrial Plant Site (#356023), Remedial Investigation/Feasibility Study, High Falls, Town of Marbletown, Ulster County, New York, prepared

by Hartgen Archeological Associates, Inc., Certified WBE/DBE, prepared for Lawler, Matusky & Skelly Engineers LLP, March 1999.

3.5 **Correspondence**

p. 302201-302202 Letter to Mr. Patrick Hamblin, Remedial Project Manager, Emergency & Remedial Response Division, U.S. EPA, Region II, from Mr. George Nieves, Chief, Western Permits Section, Department of the Army, New York District, Corps of Engineers, November 8, 1999.

p. 302203-302209 Letter to Mr. John Helmeset, NYSDEC, DER/BERA, from Mr. David Rosoff, OSC, U.S. EPA, Region II, re: The sand filter wastewater settling lagoon proposed for the Mohonk Road Industrial Plant Superfund Site, February 10, 2000. (Attachments)

p. 302210-302214 Memorandum to Mohonk Road Industrial Plant (MRIP) Site Administrative Record File, from Patrick Hamblin, MRIP Site Remedial Project Manager, re: Proposed Remedial Alternative Cost Estimate Revisions, March 2, 2000.

4.0 **FEASIBILITY STUDY**

4.3 **Feasibility Study Reports**

p. 400001-400205 Report: New York State Superfund Contract Feasibility Study Report, Mohonk Road Industrial Plant Site, Remedial Investigation/Feasibility Study, prepared by Lawler, Matusky & Skelly Engineers, LLP, prepared for New York State Department of Environmental Conservation, March 1999.

4.4 **Proposed Plan (SOP, FOP)**

p. 400206-400238 Draft Plan: Plan, Map & Report, Proposed High Falls Water District, Towns of Marbletown & Rosendale, Ulster County, New York, prepared by Brinnier and Larios, P.C., prepared for Marbletown Town Board and Rosendale Town Board, February 7, 2000.

4.6 **Correspondence**

p.	400239- 400248	Letter to Commissioner Joel A. Miele, New York City Department of Environmental Protection, from Mr. Richard L. Caspe, P.E., Director, Emergency and Remedial Response Division, re: request for Water Connection to the Catskill Aqueduct, March 30, 1999.
p.	400249- 400252	Letter to Honorable Thomas H. Jackson, Jr., Supervisor, Town of Marbletown (Ulster County), and Honorable Richard L. Caspe, P.E., Director, Emergency and Remedial Response Division, U.S. EPA, Region II, re: Request of Marbletown for "High Falls" Connection to Catskill Aqueduct, July 27, 1999.
p.	400253- 400257	Local Law Filing, New York State Department of State, re: Town of Marbletown, Local Law no. 3, a local law to mandate necessary fire flows in new water districts, September 10, 1999.

8.0 **HEALTH ASSESSMENTS**

8.1 **ATSDR Health Assessments**

P.	800001- 800035	Memorandum to Mr. Patrick Hamblin, from Mr. Michael Sivak, re: Mohonk Road: Addendum to the DEC Exposure Assessment, October 20, 1999.

10.0 **PUBLIC PARTICIPATION**

10.1 **Comments and Responses**

p.	10.00007- 10.00007	Letter to Mr. Patrick Hamblin, Remedial Project Manager, U.S. EPA, from Ms. Gretchen Reed, President, High Falls Water Coalition, re: Pubic Comment Period for MRIP Final Report, September 15, 1999.

10.2 **Community Relations Plans**

p.	10.00008- 10.00036	Plan: <u>New York State Superfund Contract Citizen Participation Plan</u>, prepared by Lawler,

Matusky & Skelly Engineers LLP, prepared for New York State Department of Environmental Conservation, June 1997.

10.3 Public Notices

P. 10.00037- 10.00039 Public Notice: "Community Update Superfund Program, Mohonk Road Industrial Plant Site, High Falls, New York," prepared by U.S. EPA, Region II, October 1999.

P. 10.00040- 10.00041 Public Notice: "Important News Superfund Program, Mohonk Road Industrial Plant Site, High Falls, New York," prepared by U.S. EPA, Region II, November 1999.

P. 10.00042- 10.00042 Public Notice: "The United States Environmental Protection Agency and New York State Department of Environmental Conservation Announce the Release of a Proposed Remedial Action Plan for the Mohonk Road Industrial Plant Superfund Site, High Falls, Ulster County, New York," December 2, 1999.

10.4 Public Meeting Transcripts

P. 10.00043- 10.00204 Transcript: "Mohonk Road Industrial Plant Superfund Site, Town of Marbletown, Ulster County, March 22, 1999 Public Meeting, U.S. EPA," prepared by Mr. Jason Wagner, a shorthand reporter of Fink & Carney Computerized Reporting Services, prepared for U.S. EPA, Region II, March 26, 1999.

P. 10.00205- 10.00268 Transcript: "Mohonk Road Industrial Plant Superfund Site, Hamlet of High Falls, Ulster County, New York, December 2, 1999 Public Meeting, U.S. EPA," prepared by Ms. Constance M. Walker, a shorthand reporter and Notary Public within and for the State of New York, prepared for U.S. EPA, Region II, December 30, 1999.

10.6 Fact Sheets and Press Releases

P. 10.00269- 10.00270 Fact Sheet: "Mohonk Road Industrial Plant Site, High Falls, New York," prepared by U.S. EPA, Region II, March 1999.

P. 10.00271- 10.00273 Fact Sheet: "Mohonk Road Industrial Plant Superfund Site, High Falls, New York," prepared by U.S. EPA, Region II, June 1999.

11.0 TECHNICAL SOURCES AND GUIDANCE DOCUMENTS

11.1 EPA Headquarters

P. 11.00001- 11.00062 Guidance Document for Providing Alternate Water Supplies, prepared by Office of Emergency and Remedial Response, U.S. EPA, February 1988.

P. 11.00063- 11.00125 Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA, prepared by Office of Emergency and Remedial Response, U.S. EPA, August 1993.

P. 11.00126- 11.00212 Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites, Final Guidance by Office of Solid Waste Emergency Response, U.S. EPA, October 1996.

11.4 Technical Sources

P. 11.00213- 11.00298 Report: New York City Water Board, Report on the Cost of Supplying Water to Upstate Customers for the 2000 Rate Year, Final Report, prepared by Black & Veatch, LLP, prepared for the New York City Water Board, August 1999.

APPENDIX IV

STATE LETTER OF CONCURRENCE

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

Environmental Conservation 30 YEARS
John P. Cahill
Commissioner

Mr. Richard Caspe
Director
Emergency & Remedial Response Division
USEPA, Region II
290 Broadway
New York, New York 10007-1866

Dear Mr. Caspe:

Re: Mohonk Road Industrial Plant Site Record of Decision
Town of Marbletown/Ulster County (NYSDEC I.D. # 356023)

The New York State Department of Environmental Conservation (NYSDEC), in conjunction with the The New York State Department of Health (NYSDOH), has reviewed the referenced Record of Decision (ROD). The elements of the selected remedy include:

- The continued operation of the NYSDEC Interim Remedial Measure (IRM) to monitor and maintain the individual granular activated carbon (GAC) filtration systems in use until the new public water supply system is fully operational.
- Operation of EPA's Non-time Critical Removal Action (NTCRA) which includes the extraction and treatment of the near field contaminated bedrock groundwater.
- The construction of a new public water supply system to provide clean and safe potable water to the residences in the Hamlet of High Falls and Rosendale with impacted or threatened private supply wells. The primary water supply for the new water district is the Catskill Aqueduct. The source of the backup supply will be determined during remedial design. (Alternative AWS 3.)
- Active remediation of the far field contaminated groundwater plume by extraction and treatment. This includes long-term groundwater monitoring that will include sampling of the Rondout Creek and the Coxing Kill. (Alternative GR 3.)
- The excavation and off site disposal of the remaining contaminated on site subsurface soils. (Alternative SC 3.)

Based on the above elements being included in the selected remedy, the Record of Decision is acceptable to the NYSDEC. The NYSDOH concurrence letter is enclosed.

Mr. Richard Caspe
Director
Emergency & Remedial Response Division
USEPA, Region II
Page 2

If you have any questions or comments on this matter, please contact Mr. Sal Ervolina, of my staff, at (518) 457-4349.

Sincerely,

Michael J. O'Toole, Jr.
Director
Division of Environmental Remediation

c: J. Fleming-Laik, Supervisor, Town of Rosendale
T. Jackson, Supervisor, Town of Marbletown
J. LaPadula, USEPA
A. Carlson, NYSDOH
A. Dumas, UCHD

APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

Mohonk Road Industrial Plant Superfund Site

INTRODUCTION

A responsiveness summary is required by regulations promulgated under the Superfund statute. It provides a summary of citizens' comments and concerns received during the public comment period, as well as the responses of the United States Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) to those comments and concerns. All comments summarized in this document have been considered in EPA and NYSDEC's final decision involving selection of a remedy for the Mohonk Road Industrial Plant Superfund Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

As lead agency for the Site, NYSDEC prepared a Citizen Participation Plan for the Site, dated June 1997. The Citizen Participation Plan included a community profile and contact list, and has also been used by EPA for its community outreach efforts at the Site. Site reports have been made available for public review at information repositories at the EPA Docket Room in Region II, New York, and the Stone Ridge Library, Stone Ridge, New York, and the Rosendale Public Library, Rosendale, New York.

The Proposed Remedial Action Plan (or Proposed Plan) was prepared by NYSDEC, with consultation by EPA, and finalized in November 1999. A notice of the Proposed Plan and public comment period was placed in the Daily Freeman on November 15, 1999 consistent with the requirements of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) §300.430(f)(3)(i)(A), and a summary of the Proposed Plan was mailed to all persons on the Site mailing list. The Proposed Plan was made available for review at the information repositories for the Site. Prior to the onset of the public comment period, EPA received a request from the High Falls Water Coalition that the comment period be established for 60 days rather than 30 days. The public comment period was scheduled from November 15, 1999 to January 15, 2000, but was extended to February 15, 2000 to accommodate additional requests for an extension. EPA hosted a public meeting on December 2, 1999 to discuss the Proposed Plan. At this meeting, representatives from EPA and NYSDEC answered questions about contamination at the Site and the remedial alternatives.

Additional public participation activities were also conducted prior to the release of the Proposed Plan. EPA participated in a public meeting hosted by NYSDEC on October 28, 1998 to discuss the Remedial Investigation (RI) and the preliminary results of the Feasibility Study (FS). At the October 1998 meeting, EPA presented the preliminary findings of its Engineering Evaluation and Cost Analysis (EE/CA) report, which reviewed alternatives for a Non-Time Critical Removal Action (NTCRA). EPA subsequently opened a public comment period for this proposed action from February 26, 1999 through March 28, 1999. On March 22, 1999, EPA conducted a public meeting on the NTCRA. EPA mailed an updated Site Fact Sheet to all persons on the Site mailing list in June 1999 and hosted a public availability sessions to discuss the NTCRA and potential long-term cleanup plans on June 17, 1999. Another updated EPA Site Fact Sheet was mailed to all persons on the Site mailing list in October 1999 and an another public availability session was hosted by EPA on November 3, 1999.

OVERVIEW

The preferred remedy includes the following components:

Alternate Water Supply (AWS) Alternative AWS-3, construction of a water treatment plant and distribution system with water supplied from the Catskill Aqueduct.
Groundwater Response (GR) Alternative GR-3, groundwater extraction and treatment using an air stripper, to restore the aquifer to its most beneficial use.
Source Control (SC) Alternative SC-3, excavation and off-site disposal of contaminated soil.

The majority of the comments from the public have supported the preferred alternatives. However, concerns were expressed regarding the mechanisms under which the proposed water district would operate. The key concerns involve the cost of the water district to local residents, the source of backup water supply, the district boundaries, whether the water district would require residents within the proposed water service area to be a part of the proposed water district, and if local private wells for residents within the district would be taken out of service.

Attached to this Responsiveness Summary are the following Appendices:

Appendix A - Proposed Plan
Appendix B - Public Notice
Appendix C - December 2, 1999 Public Meeting Attendance Sheet
Appendix D - Letters Submitted During the Public Comment Period

SUMMARY OF COMMENTS AND EPA'S RESPONSES

The specific comments have been organized as follows:

- Site Characterization
  - Aquifer Characteristics
  - Modeling
- Evaluation of Remedial Alternatives
- Implementation of Alternate Water Supply
  - Boundaries of the Proposed Water Service Area
  - Water District Formation
  - Supply, Treatment and Distribution
  - Backup Water Supply
- Implementation of Groundwater Response and Source Control Alternatives
- Miscellaneous

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

<u>**Site Characterization**</u>

Aquifer Characteristics

Comment #1: How quickly is the plume moving, is it just the leading edge of the plume that is migrating?

Response #1: Based on data from a pump test performed during the RI, the rate of the groundwater movement is estimated to be 0.26 feet per day (or 95 feet per year). Both the concentrated portion of the plume [i.e., the nearfield plume, which has over 1,000 parts per billion (ppb) of total volatile organic compounds (VOCs)] and the more dilute leading edge of the plume (i.e., the farfield plume, which has 10 to 1,000 ppb of total VOCs) are expanding. The groundwater plume continues to migrate slowly from its current position, impacting additional private wells. The groundwater extraction and treatment system being installed as part of the NTCRA will minimize the migration of the nearfield plume. This system should be operational in Spring 2000. Migration of the farfield plume will be minimized by implementation of Alternative GR-3. Until these response actions are implemented, both components of the plume continue to expand and adversely impact the bedrock aquifer.

Comment #2: If the plume is not addressed, will the groundwater contamination problem worsen?

Response #2: Based on modeling data from the FS, without a response action, the plume will continue to migrate north and northwest toward the Rondout Creek and northeast toward the Coxing Kill, and may adversely impact additional private wells. The degradation of contaminants within the plume may also result in break-down products with higher toxicity, such as vinyl chloride.

Comment #3: Does the Rondout Creek provide a barrier to contamination movement? The RI/FS does not indicate whether the Rondout Creek or the Coxing Kill were sampled for VOCs. Surface water and sediment from the Rondout Creek and the Coxing Kill should be included in the long-term monitoring program; if samples have not yet been obtained from these creeks, they should be obtained prior to remediation activities in order to develop background data.

Response #3: It is unknown if there is a hydrogeologic link between the plume and the Rondout Creek, or whether the Rondout Creek provides a barrier to plume movement. The Rondout Creek was sampled by EPA's Removal Program in March 1999. The Coxing Kill was sampled as part of the ecological evaluation for the effluent discharge from the groundwater treatment plant which was installed as part of the NTCRA. Based on these sampling events and the monitoring and residential well data, it does not appear that the VOC plume has impacted the Rondout Creek or Coxing Kill. The selected Groundwater remedy includes a long-term program for monitoring the Rondout Creek and the Coxing Kill surface water quality.

Comment #4: More bedrock groundwater contour data should be collected to ensure that the direction of bedrock groundwater movement is towards the north, northwest and northeast.

Response #4: Bedrock water levels are typically measured as part of the monitoring well sampling events (e.g., EPA's October 25, 1999 Sampling Trip Report), however, the bedrock contour maps are not routinely updated with these data. Recent water table measurements will be incorporated in additional modeling performed during the remedial design to assess groundwater movement.

Comment #5: The two pump tests performed during the RI did not have sufficient coverage to the east of the MRIP property, and flow to the east of the property has not been adequately studied.

Response #5: The pump tests described in the RI have been supplemented by pump tests performed by EPA for the NTCRA (this information can be found in Technical Memos dated February 25 and June 11, 1999, which are part of the Administrative Record for the

Site.) During NYSDEC's pump tests, the groundwater level was monitored in several nearby monitoring wells, and three domestic wells east of the MRIP property. Additional pump tests were performed by EPA, during which the groundwater level was monitored in four domestic wells east of the MRIP property and several monitoring wells.

Comment #6: The information in the RI does not give a clear indication that the vertical extent of the contamination has been fully defined. In order to get a better understanding of groundwater flow patterns at the Site, it was recommended that EPA perform a fracture trace utilizing aerial photographs, additional packer tests on off-site wells (specifically monitoring wells MW-8B, MW-9B, MW-10B, MW-14B and MW-15B), and borehole geophysical techniques on wells not tested during the RI (MW-1B, MW-5B, MW-6B, MW-7B, MW-7R, MW-11C and MW-15B). It was also noted that a shale layer was encountered during drilling of MW-11C (at approximately 210 feet below grade), which could present a pathway for migration, and that packer testing should be performed on the shale layer to determine its permeability and any impacts to this aquifer, and the extent of shale should be further described.

Response #6: The noted recommendations can be very useful in determining the pathways of migration in this type of aquifer system. NYSDEC and EPA have incorporated these investigative efforts in their Site characterization activities. NYSDEC performed a fracture trace analysis using aerial photographs, which is described in the Section 3.7 of the Immediate Investigation Work Assignment Report, dated January 1997. NYSDEC performed packer tests on several wells to help vertically delineate the VOC plume, as described in the RI. Based on these studies, groundwater contaminated with VOCs was found in fractures at a depths up to 188 feet below grade. The need for additional packer testing on the suggested monitoring wells (MW-8B, MW-9B, MW-10B, MW-14B and MW-15B) will be evaluated as part of the groundwater modeling effort which will be performed during the remedial design.

It is noted that in September 1999, EPA's Removal Program geophysically logged several wells on the MRIP property (MW-1B, -6B, 5R, -7R and ERT-1, -2, -3, and -4) which were not surveyed as part of NYSDEC's RI/FS.

Comment #7: The FS indicated that other formations such as Upper Silurian fractured shale, dolostone and limestone of the High Falls Formation exist in a thin section on the eastern edge of the Rondout Creek. During the remedial design EPA should consider the effect that contact between these formations has on groundwater flow.

Response #7: Comment noted, these comments will be considered during the remedial design.

Comment #8: A commenter noted that it was not evident from the RI that upgradient wells have been sampled and recommended installation of upgradient monitoring wells.

Response #8: Several upgradient residential wells have been sampled as part of the residential well sampling efforts performed by EPA, the Ulster County Health Department (UCHD), and NYSDEC. The results indicate that these wells have not been impacted by Site-related contaminants. Installation of additional monitoring wells will be considered during remedial design.

Groundwater Modeling

Comment #9: Several comments were made regarding the groundwater modeling performed during the FS. It was noted that the model used, MODFLOW®, did not account for a fractured bedrock aquifer system, that a different model thickness should have been considered, a shale layer should have been accounted for in the model (if it was found to be a continuous layer and impacted by the plume), and that the southern model limit should be moved further south away from the study area.

Response #9: It is true that there are inherent difficulties in modeling a bedrock aquifer system, because fractures are the route for the movement of the contaminants in the system, and the path of individual fractures is difficult to predict. NYSDEC performed groundwater modeling as part of the FS using MODFLOW®, and EPA performed modeling as part of the NTCRA using the TIMES® model; both of which are two-dimensional models which assume homogeneity, and do not account for the fractures. Nevertheless, the models were calibrated with pump test results, and yielded excellent correlation to the actual measured aquifer conditions. These comments will be considered when additional modeling is performed during the remedial design to determine the optimum location of the extraction and backup wells and the area impacted by water table drawdown.

Evaluation of Remedial Alternatives

Comment #10: A commenter noted that the Proposed Plan identified significant details which would be addressed during the remedial design, but was silent on the manner and method in which the plan would be modified based on data generated during the design. The procedure for identifying a variation, communicating it to the public and charting a new course should be defined and outlined. Another commenter noted that additional information on the project should be available during the design of the drinking water treatment and distribution system, and requested future meetings to keep the public appraised as to the status of the project, and any changes to the plan which may arise during design. A commenter noted that based on the FS and Proposed Plan, it was unclear what role the Towns would have in the design and construction of the system.

Response #10: Comments noted; the community will be notified as the remedial design progresses. Again, it is important to note that the Proposed Plan and the Record of Decision (ROD) describe a remedy in general terms, while future plans developed during the design determine exactly how the remedy will be implemented, including all relevant details of operation. EPA will hold informational meetings and prepare fact sheets to keep the public and Towns informed of the progress of the remedial design and construction and any modifications of the planned approach. The Towns will be provided with design documents for review and comment, should they determine that to be necessary. It is not anticipated that the Towns would play an active role in construction of the system.

Comment #11: A resident noted that they own a home on the edge of the plume and that their water had bacteria problems and was extremely hard in nature, which created significant costs for treatment, and supported the implementation of public water system.

Response #11: Comment noted.

Comment #12: In order to clean up the Site to be able to later extract clean drinking water from the groundwater, does the community have to support a public water system?

Response #12: Yes. Implementation of the selected Alternate Water Supply remedy, AWS-3, is contingent on the formation of a local water district. The selected groundwater remedy, GR-3, must be paired with an AWS alternative which provides an alternate water supply, such as AWS-3 or AWS-4, because operation of the groundwater extraction and treatment system will lower the water levels of wells within the proposed water service area (PWSA).

Comment #13: Have EPA and NYSDEC considered connecting the proposed water district to the currently operating Rosendale district.

Response #13: This approach was identified in the FS, however, the Rosendale district was determined not to have sufficient capacity to support the proposed water district. As a result, this approach was not retained as an alternative for detailed evaluation.

Comment #14: Implementation of the water supply system with fire flow service would aid fire fighting efforts in the future.

Response #14: Comment noted. The design of the public water system would provide for fire flow to meet local requirements.

Comment #15: Do homeowners have to pay for water from the New York City Aqueduct rather than well water? Would the well field Alternative AWS-4 provide a free source of water to the residents?

Response #15: Yes, the cost estimate for AWS-3 does include costs to purchase water from New York City (approximately $8,800 per year), while there is no cost to purchase water under AWS-4. However, the operation and maintenance cost projection of Alternative AWS-4 ($88,000/year), which would be assessed to users by the proposed water district, is about the same as the selected Alternative AWS-3, use of the Catskill Aqueduct ($76,000/year) which includes the costs to purchase water from New York City. The estimated cost to the homeowners is $361 to $515 per year for Alternative AWS-3 and $506 to $615 per year for Alternative.

Comment #16: Why is the estimated operation and maintenance cost for the well field alternative more than the estimated operation and maintenance cost for the aqueduct alternative?

Response #16: The well field Alternative AWS-4 has a higher estimated operation and maintenance cost primarily due to electrical costs for pumping. With the aqueduct Alternative AWS-3, the water would be delivered to the ground surface under pressure.

Comment #17: Would the treatment systems be similar for both the well field and aqueduct alternatives? With the aqueduct alternative, would a separate treatment system be required to treat water from a backup well field?

Response #17: Because the sources of water are different (reservoir water from the aqueduct versus groundwater from the well field), each system would be operated differently to meet primary and secondary drinking water standards. The FS and Proposed Plan considered a conceptually similar treatment system for the well field Alternative AWS-4 as the aqueduct Alternative AWS-3 in order to address high levels of naturally occurring metals found in the groundwater (primarily iron, manganese, calcium, and magnesium). Separate treatment systems for the backup water and aqueduct water supplies should not be necessary.

Comment #18: A commenter questioned whether the groundwater extraction and treatment system was considered as a source of potable water? Additionally, the Town of Marbletown requested that it be considered as a potential backup supply.

Response #18: The use of the groundwater extraction and treatment system was not considered for use as an alternate water supply in the FS. However, in response to comments requesting that use of treated water from the groundwater extraction and treatment system be considered as a backup supply, this potential source will be one of the backup supply options evaluated during remedial design (see Response #50).

Comment #19: A resident asked for clarification regarding the estimated cost for maintaining the granular activated carbon (GAC) systems.

Response #19: Over the last three years, the annual average cost for NYSDEC to service and sample the GAC systems was approximately $1,460 per system, however, over the last year this cost rose to $1,698 per system. Additional increases are expected in the cost to maintain these systems in the future due to the age of the systems and the high metal content in many of the local wells. The anticipated cost to service these filters in the future is $2,215 per system. Costs associated with servicing these filters include monitoring (pre-filter, post-filter, and split samples), carbon media replacement, and UV bulb replacement. The costs to residents to service these filters may be less than this projection, depending on the frequency of monitoring and service of the systems. However, any individual maintenance of GAC systems for less than the NYSDEC average costs would likely result in a reduced level of monitoring and service.

<u>**Implementation of Alternate Water Supply**</u>

Boundaries of the Proposed Water Service Area (PWSA)

Comment #20: Numerous residents and Town officials inquired as to the criteria used for determining the PWSA.

Response #20: The boundaries of the PWSA were selected based on:

1) Properties which are currently contaminated or threatened by the VOC groundwater plume;

2) Properties which are anticipated to be impacted by drawdown from the extraction and treatment system or from operation of the backup water supply; and

3) Engineering considerations, such as the selection of optimal water mains routes to minimize dead-ends in the distribution system, and to avoid private property and culturally sensitive areas.

The PWSA was delineated based on conservative estimates of plume migration, which utilized the groundwater modeling from the FS and residential and monitoring wells sampling data, to include both properties currently or potentially impacted. The boundary of the PWSA was presented at public meetings and discussed in meetings with Town representatives and their consultants.

While the PWSA was designed to include properties with contaminated wells and properties threatened by the groundwater plume, the service area could be expanded in the future to include additional properties that do not meet EPA's criteria for inclusion. This expansion would have to be paid for by the water district.

Comment #21: Several commenters noted that their wells are not currently contaminated, and inquired why they should have to hook up to the district and pay for public water.

Response #21: As stated above, there are three main criteria EPA utilized for including properties in the PWSA; residential wells within the PWSA which are not currently contaminated are included within the PWSA because they maybe impacted by contamination or drawdown of the aquifer in the future, or for engineering considerations. Additionally, the following benefits may be realized by homeowners through the use of public water:

1) Users receive water which meets primary and secondary drinking water standards;
2) Concerns regarding whether wells would become contaminated in the future would be alleviated;
3) Concerns regarding low yields during drought conditions or due to potential drawdown from the groundwater extraction and treatment system would be alleviated;
4) No need for future well maintenance;
5) Fire flow service would be provided nearby;
6) Homeowner's insurance rates may decrease as a result of nearby fire flow service;

7) Property values in the PWSA may increase.

Comment #22: Several homeowners who were not included in the PWSA asked to be included.

Response #22: The criteria for including properties within the PWSA are noted above in Response #20. However, the Towns could independently expand the water district. In cases where properties do not meet the criteria outlined in Response #20, requests for inclusion in the water district should be directed to the appropriate Town representatives.

Comment #23: Several commenters suggested sampling additional residential wells outside of the PWSA to ensure that impacted properties have not been left out of the PWSA. A commenter suggested developing baseline data for an additional section of properties outside the PWSA, including water quality and well depth. Who will be responsible for the continued monitoring of wells, particularly wells on the perimeter of the district and for how long? How often are the private wells tested?

Response #23: EPA agrees with this suggestion, and has in fact implemented such a program. EPA's Removal Program sampled approximately 140 private wells during December 1999 and February 2000. The December 1999 and February 2000 data were used by EPA and NYSDEC to confirm the PWSA boundaries and to include additional properties in the PWSA. In addition, UCHD had collected extensive data on many homes located on the perimeter of the plume. These wells are monitored on a quarterly basis. NYSDEC routinely monitors private wells fitted with GAC systems. The frequency of NYSDEC monitoring depends on the levels of VOCs detected at the individual wells and, at a minimum, they are monitored on a yearly basis. The data from all the sampling efforts has been compiled in a database and will be used to develop a residential well monitoring program to monitor the wells at the perimeter of the PWSA as part of EPA's remedial action. Because the PWSA was designed to service all impacted and threatened properties, there should be minimal sampling necessary outside of the PWSA.

Comment #24: What will be the mechanism for extending the district if more wells become impacted by contamination or drawdown, and can the supply system handle the additional properties? Commenters wanted assurance that if additional wells were found to be contaminated, the problem would be remedied.

Response #24: As noted above in Response #20, the PWSA boundaries are conservative and EPA and NYSDEC do not anticipate additional wells becoming impacted or threatened by the groundwater plume. If additional homes are impacted or threatened by the plume, EPA and NYSDEC would take steps to ensure that these properties have a safe supply of water. Depending on the circumstances, such homes might be included in the PWSA, or provided with whole house treatment units. The water capacity estimates for the supply system are based on conservative estimates which would provide a reasonable buffer. The capacity of the system will be reassessed during the Remedial Design, to ensure that the water supply system has sufficient capacity to handle some additional properties.

If additional contaminated wells are identified and it is determined that contamination is best addressed via inclusion in the PWSA then the proposed water district would need to formally expand the PWSA to include additional residences to the district (i.e., these properties could be included in a revised Plan, Map & Report). The Towns are currently considering mechanisms to allow for the inclusion of additional properties within the proposed water district under such circumstances after the district is formed.

Comment #25: The Town of Rosendale requested that four additional properties along Route 213 be included in the PWSA.

Response #25: Recent sampling results (December 1999 and February 2000) indicate that two of these properties have been impacted by Site-related contaminants. Based on these data, these properties, and the two other properties which are threatened, will be included in the PWSA.

Comment #26: A resident noted that some of the properties included within the PWSA, which are north of Route 213, have not been impacted by the VOC plume, and expressed skepticism that these wells were threatened by the plume.

Response #26: As noted above in Response #20, three criteria were used in defining the PWSA boundaries. Based on the historical residential well sampling results, Site-related VOCs have been detected in several properties north of Route 213, indicating that the plume threatens this area. Hence, properties in this vicinity were included in the PWSA.

Comment #27: Concerns were expressed about impact of possible development of vacant property within the water district and the district's ability to handle such development. Commenters suggested that the system has capacity to support reasonable growth within vacant areas. Institutional controls should address development of vacant parcels within the PWSA before the water district is operating.

Response #27: There are several large, undeveloped properties within the PWSA. Currently, only one of these properties is under development. The capacity of the proposed drinking water treatment plant will be further reevaluated during the remedial design. EPA can allow for some additional capacity based on future development of these properties. Any other additional increased capacity would be deemed an enhancement and would need to be funded by the water district.

Institutional controls such as governmental controls (e.g., ordinances) and property controls (e.g., deed restrictions) to prevent groundwater use may be implemented in the selected remedy.

Comment #28: Development outside of the PWSA, which may require the use of private wells, should be addressed in the long-term institutional controls developed for the overall remediation plan.

Response #28: Development outside of the PWSA boundaries should not have an impact on the efficiency of the groundwater extraction and treatment system. As stated previously, the PWSA boundaries were based on conservative estimates. In the event that wells outside the PWSA become impacted or threatened by the groundwater plume, actions may be taken to provide potable water, including connection to the water district or provision of GAC filters. Institutional controls, such as local laws prohibiting private well use, may also be employed.

Comment #29: The Town of Marbletown requested that the water main for the distribution system be routed to the intersection of Berme and Canal Roads, rather than across a private driveway as indicated in the conceptual layout for the water distribution system, and recommended that the properties adjacent to these roads be included in the PWSA.

Response #29: EPA and NYSDEC have evaluated and agreed that these changes are appropriate based upon engineering considerations.

Comment #30: A commenter noted that the location of backup well(s) would impact the boundaries of the PWSA.

Response #30: Depending on their location, the backup supply well(s) could have an impact on the district boundaries. After the backup water supply source is selected during remedial design, additional modeling will be performed to ensure that properties outside the PWSA would not be adversely impacted by water table drawdown. If modeling indicates that wells outside the PWSA would be adversely impacted by drawdown from use of a backup well, they would be provided an alternate water supply. If a backup well(s) is located near MRMW 13B (the preferred backup source), it is unlikely that the district boundaries would need to be expanded, because additional homes in this area were included in the PWSA during the comment period. Additional details about the backup supplies which are being considered are discussed in Response #50.

Water District Formation

Comment #31: Why does a water district need to be formed and who is responsible for forming it?

Response #31: A water district needs to be formed in order to assume control of the drinking water treatment plant and distribution system after they are constructed by EPA. An alternate water supply (either through Alternatives AWS-3 or AWS-4) will need to be in place in order for EPA to effectively extract and treat the groundwater plume under Groundwater Response Alternative GR-3 without having an impact on residential wells. The water district will be a local governmental entity, and the Towns of Marbletown and Rosendale are currently proceeding with district formation following the process described in State and Town Law.

Comment #32: The Proposed Plan relies heavily on the formation of a municipal water district, which is subject to specific policies, procedures and requirements as outlined in State Law, and the proposed remedy breaks down if the municipal district is not formed. The Proposed Plan insufficiently details the responsibilities that will ultimately be transferred to the district and further, fails to identify the costs related hereto. To ensure public participation and success of any referendum, full and complete details of all required district activities and costs should be developed now.

Response #32: The proposed water district will be responsible for the operation and maintenance of the drinking water treatment plant and distribution system, once the infrastructure has been constructed by EPA. The anticipated activities of the district are described in Section 13.4 of the FS. The Proposed Plan and FS included the anticipated costs for operation and maintenance (O&M) of the proposed water district under the O&M costs for Alternate Water Supply Alternative AWS-3. These costs were estimated at $64,000 per year. Subsequent to the issuance of the Proposed Plan, the Towns' engineers provided their own O&M estimate which includes the cost for purchase of water from New York City. This revised estimate is $76,000 per year. Detailed operating workplans for the district will be developed during the remedial design. It is important to note that the Proposed Plan and the ROD are intended to describe a remedy in general terms, while future plans developed during the design determine exactly how the remedy will be implemented, including all relevant details of operation.

Comment #33: What type of Environmental Impact Studies would need to be performed by the Towns of Rosendale and Marbletown prior to formation of the district to comply with requirements of the State Environmental Quality Review Act (SEQRA)?

Response #33: Because the construction of the necessary infrastructure of the water district will be performed by EPA as an action under the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), NYSDEC has indicated that it is not necessary for the Towns to perform any SEQRA assessments of potential construction impacts. In any event, the Superfund review process conducted during the RI/FS serves as the functional equivalent of an environmental impact assessment. At the most, the Towns might wish to prepare an abbreviated assessment to analyze the potential impacts of just the administrative act of forming the district.

Comment #34: The Towns of Rosendale and Marbletown have incurred costs related to the water district formation and their consultants drafting the Plan, Map & Report. Can the Towns be reimbursed for costs related to the formation of the water district? Other commenters noted that the Towns would have additional expenses related to review of the design of the system, and suggested that these costs be identified, and considered for reimbursement.

Response #34: EPA is reviewing the request for reimbursement to determine whether the expenses related to district formation can be considered reimbursable response costs under CERCLA, and will inform the Towns when a final determination is made.

Additional expenses related to the Towns' evaluation of EPA's remedial design have not been estimated. While EPA would work closely with the Towns during the design process and will offer the Towns the opportunity to review the design, costs incurred by the Towns would not be reimbursed as EPA does not reimburse municipalities for design reviews of Superfund projects.

Comment #35: A Plan, Map & Report, which describes the district boundaries and costs, is prepared by the Towns in order to form a water district. In general terms, a public information meeting on the Plan, Map & Report usually occurs at such time as it is possible to identify exactly who will be included in the proposed district and the approximate cost for users. Ideally the Plan, Map & Report should be prepared following the Record of Decision and nearing the end of the remedial design phase. Finalization of the Plan, Map & Report should be delayed until all evaluations are completed (i.e., selection of a backup water supply and additional residential well sampling) or the Plan, Map & Report should specifically include procedures for the expansion and inclusion of other potentially impacted properties.

Several comments were also provided on the intermunicipal agreement and resolution which would need to be passed by the Towns in order to form the water district. Comments were also provided on mechanisms the Towns should follow for mandatory and permissive referendum processes to form the district.

It was also noted that the time required to form the district should be included in the estimated time for cleanup.

Response #35: The Towns held a public hearing on March 16, 2000 to present the draft Plan, Map & Report as part of community outreach efforts for the district formation, and the district boundaries considered at the meeting are based on the best available data accumulated to date. EPA has consulted with Town officials to discuss the PWSA boundaries and the possible need for future district expansions later, if additional properties are found to be impacted. Provisions are being made to consider future expansion of the district, if necessary. EPA believes it would not be prudent to complete a remedial design prior to formation of the water district. The water district must also be formed prior to finalizing a use agreement with the New York City Department of Environmental Protection (NYCDEP).

Comments regarding the draft Intermunicipal Agreement, the water district formation resolution, and the referendum process would be best addressed by the Towns and their attorney.

Based on meeting with the Towns, EPA believes that the Plan, Map & Report will be finalized soon and the district should be formed shortly, in which case the district formation should not delay implementation of the alternate water supply remedy.

Comment #36: A number of residents expressed concerns about whether it would be mandatory that they connect to the proposed water district, (especially those residents of properties that are inside the PWSA and not currently impacted), and whether they would be required to close their wells; some indicated that they would like to maintain their wells for primarily outdoor uses.

Response #36: The proposed water district, not EPA, will establish the operating procedures of the district, including any provisions requiring hook-up and well closure. If there are no water district provisions which require residents within the district to hook-up to the water distribution system, and if a resident declines access to install the connection and is subsequently impacted by drawdown from the extraction and treatment system, the homeowner would need to drill a deeper well or pay for the connection of their home to the distribution system at that time. Similarly, EPA would provide funding to have private wells properly decommissioned with the owner's consent. If residents deny access to seal the wells, and later want the well closed due to insufficient yield, they would be responsible for paying for well closure.

Supply, Treatment and Distribution

Comment #37: The proposed source of water is the Catskill Aqueduct, what other Towns purchase water from New York City and use the Catskill Aqueduct as a source of water supply? Was it necessary that these Towns tie into the aqueduct when the system was constructed?

Response #37: Several Towns use New York City's water supply system as a source of potable water (e.g., White Plains, Scarsdale, New Rochelle, Yonkers, Mamaroneck, Harrison, Mount Vernon, Carmel, Newburgh, and Cornwall). The Town of New Paltz, located near High Falls, also uses New York City's water supply, via the Catskill Aqueduct, as a source of potable water (along with a series of upland reservoirs). Connection to New York City's water supply system is not dependent on whether the request was made during construction of the system, and the provisions for using New York City's water supply system are covered in New York City's 1905 Water Supply Act. The NYCDEP has indicated that it is amenable to use of New York City's water supply system by the district. The details of the operating conditions and use of New York City's water supply will need to be formalized in a use agreement between the water district and NYCDEP.

Comment #38: Which tunnel out of NYC's system would supply water for the district? Will completion of the third tunnel project by New York City result in the Catskill Aqueduct being taken out of service?

Response #38: The raw water for the district will be supplied by the Catskill Aqueduct. Completion of the third tunnel project by New York City is an infrastructure improvement of New York City's water distribution network within the City itself, which would not impact the Catskill Aqueduct.

Comment #39: Additional details were requested about the type of treatment which will be used for the public water supply.

Response #39: To date, the public water supply has been only conceptually developed, and the exact treatment components will be selected during the remedial design to be consistent with the Surface Water Treatment Rule (40 CFR Parts 141 and 142) and the Small System Compliance Technology List for the Surface Water Treatment Rule (EPA 815-R-97-002, EPA 815-R-98-001, EPA 815-R-98-002, EPA 815-R-98-003). Raw water from the aqueduct will be treated to remove conventional contaminants, such as particulates, color, taste, odor, and microbes. A conventional treatment scheme for a surface water supply includes coagulation, flocculation, sedimentation, filtration, and disinfection. A similar treatment scheme is currently used by the Village of New Paltz to treat its water supply, a portion of which is also drawn from the Catskill Aqueduct.

Comment #40: Have alternatives other than chlorine been considered for disinfection and could alternatives other than chlorine be considered during a pre-design study? How would the chlorine levels be monitored?

Response #40: While the use of chlorine is a widely-used, proven, cost-effective method for disinfection, other disinfection techniques suitable for the system would be considered in the remedial design. The use of chlorine is an advantageous disinfection technique because it results in residual levels which ensure disinfection throughout the distribution system. Monitoring for chlorine residual levels would be included as a part of the normal operating procedures of the water district.

Comment #41: How long will it take to construct the public water supply treatment system and connect the homes?

Response #41: The Proposed Plan estimated it would take 2 years to construct the water supply system, but does not include the time to design the system, or to procure the contracts. Considering both design and construction, the system would be in place within approximately 3 to 4 years.

Comment #42: Several commenters requested that EPA and NYSDEC clarify the responsibilities for paying for operation of the water district (i.e., equipment failures) and other response costs, and the estimated yearly cost for residents in the water district. A commenter noted that they were under the impression that NYSDEC was going to pay for funding of the water treatment and distribution system, and wanted to clarify that the yearly costs for maintaining the district were the responsibility of the homeowner.

Response #42: Capital costs for the selected response actions for groundwater and soil would be funded by EPA and NYSDEC, as would the first 10 years of operation of the groundwater treatment system; NYSDEC would be responsible for operation of the groundwater extraction and treatment system thereafter. The capital costs for implementation of the selected Alternate Water Supply Alternative, AWS-3, would also be paid for by EPA and NYSDEC. All of the Operation and Maintenance (O&M) costs for Alternative AWS-3, include equipment replacement, are assumed to be funded by the proposed water district. As described in the Proposed Plan and at public meetings, EPA does not fund O&M expenses related to the operation of a treatment plant for the primary purposes of providing public water. The projected costs for homeowners is based on the estimated operation and maintenance cost for the proposed drinking water treatment plant and the number of residents in the PWSA. The Record of Decision uses the Towns engineer's revised assessment of annual operation and maintenance costs for the proposed water district ($76,000/year), or $362 to $515 per user per year, which recently became available. This estimate is greater than the cost estimated in the Proposed Plan ($64,000/year).

Comment #43: Does the estimated per household cost for Alternative AWS-3 include the cost of purchasing water from New York City?

Response #43: The FS and Proposed Plan did not include the cost for purchasing water from New York City, however, the cost of purchasing water from New York City is included in the current cost estimate. The current wholesale purchase rate for New York City's water is $383.83 per million gallons. Based on the average daily demand estimated in the FS (63,050 gallons per day), this would result in an approximately $8,800 increase in the total yearly operation and maintenance cost projection in the FS and Proposed Plan. As noted above, the Record of Decision uses the Towns engineer's revised assessment of annual operation and maintenance costs for the proposed water district ($76,000/year). This cost projection accounts for New York City's water use fee, and some miscellaneous expenditures.

Comment #44: How do we know whether the water use rate charged by New York City will increase?

Response #44: Based on the New York City Water Board's Report on the Cost of Supplying Water to Upstate Customers for the 2000 Rate Year (August 1999), New York City's water use rate has increased over the last several years, and is projected to increase in the future. However, as indicated above, the water use rate is a small component of the overall estimated district cost. In order for New York City to increase its water use rate, the City would prepare a report which explains the proposed water rate increase which would be subject to public review and comment.

Comment #45: A commenter indicated they felt that the proposed water district would be a financial burden to many residents on a fixed income, and there were not enough properties within the proposed water service area to offset the costs.

Response #45: Of the alternatives considered in the FS and Proposed Plan, the selected Alternative AWS-3, would result in the least cost per user which is estimated at $362 to $515 per year. The estimated cost per user for maintaining the GAC systems (which would be the responsibility of homeowners under Alternatives AWS-1 and AWS-2) would be $2,215 per year. The estimated cost per user for maintaining a well field and treatment system under Alternative AWS-4 would be $506 to $615 per year.

Although the districts costs would be reduced by including additional homes and residences not currently in the PWSA within the district, under the Superfund program EPA and NYSDEC can only fund actions which would supply water to impacted or threatened residences.

Comment #46: A resident noted that residents should consider that there is a current cost associated with maintaining private wells (i.e., maintaining treatment equipment and electrical costs) and that these costs should be considered when evaluating the estimated homeowners' cost for maintaining a public water system.

Response #46: EPA recognizes that currently there are costs for residents to maintain a private well; however, these costs depend on the type of treatment system used (e.g., water softener, UV), frequency of maintenance (e.g., water quality monitoring, pump replacement), and amount of use (i.e., electrical costs) which make an average resident's cost difficult to predict.

Comment #47: Who will pay to connect homes within the PWSA to the water distribution system?

Response #47: EPA will pay for the connection of the homes and businesses with wells in the PWSA to the water distribution system at the time of remedy implementation. Those who do not want to hookup at that time will bear those costs in the future without benefit of EPA assistance.

Comment #48: Concerns were expressed regarding the construction of the water system, including potential damage to residents' homes, disruption of roads during construction, and potential impacts on local businesses.

Response #48: Preventative steps will taken to prevent damage to homes, and minimize traffic disruption during the construction of the public water system. It is expected that any potential impacts can be avoided or mitigated through the use of appropriate engineering controls.

Comment #49: Concern was expressed about the selection process for contractors, and whether only "low bidders" would be selected.

Response #49: EPA must follow standard federal contracting procedures when hiring a contractor to perform the work at the Site. The contractor selection process will depend on the mechanism used to obtain a contractor. For example, it is anticipated that the design and construction of the water distribution system will be handled through an Interagency Agency Agreement with the Army Corps of Engineers, which may use one of a group of prequalified contractors to perform the work, or could competitively bid the contract, in which case, the lowest responsive responsible bidder who has demonstrated that they have the technical qualifications to perform the work would be selected.

Backup Water Supply

Comment #50: Several commenters inquired as to the options considered for a backup supply, others (including the Town of Marbletown) requested that use of treated groundwater from the extraction and treatment system be considered as a source of backup supply. Other commenters requested additional details on this possibility, such as the amount of sampling which would be performed on the treated water. Other comments discouraged this approach, and noted that the groundwater extraction and treatment system would be designed to achieve NYSDEC surface water discharge standards for the treated water and not more stringent drinking water standards.

Response #50: Three options will be considered during the remedial design for the backup supply, namely: 1) the installation of a public supply well(s) (the preferred option), 2) the use of treated water from the groundwater extraction and treatment system, and 3) the use of the Rondout Creek.

Under option 1, well MRMW-13B could be converted to an extraction well or a new well would be located in the vicinity of MRMW-13B. Well MRMW-13B would be considered for backup supply well because it was found to have a high yield, has not been impacted by the VOC plume, and residential wells in this area reportedly have artesian properties. Pump tests of well MRMW-13B and groundwater modeling would be conducted during the remedial design to determine the well's yield and assess the impact of pumping this well, or another well in this area, for extended periods on nearby potable wells. If pump tests or modeling indicate that nearby wells would be adversely impacted by water table drawdown from operation of the backup wells for an extended period of time, measures would be taken to mitigate these impacts (i.e., these residences would be considered eligible for inclusion in the PWSA, the potable wells could be drilled to a deeper depth, or another backup supply well would be installed farther away from these wells).

In order to use the treated water as a source of backup supply (option 2), it would need to be determined during the remedial design that this system could reliably produce sufficient yield to meet the demand. Although the NTCRA groundwater extraction and treatment system would be designed to comply with meeting NYSDEC surface water discharge standards, the treated groundwater would then need to be transported to the drinking water treatment plant for treatment to remove naturally occurring metals, such as iron and manganese (if necessary), disinfection and distribution.

Based on community opposition to option 3, and the fact that using the Rondout Creek as a backup supply is estimated to be about twice as costly as option 1, the Rondout Creek would not be pursued unless no other alternative for backup were available.

In summary, EPA believes that option 1, i.e., having a dedicated well(s) available for backup supply, may be the most practical and reliable option.

Comment #51: Clarification was requested on the duration of the backup water supply required under Alternative AWS-3, for periods of time when the Catskill Aqueduct is not in service. Many comments expressed support for a backup water supply which would provide a long-term source of water, in the event that the aqueduct was taken out of service for extended periods of time, or as an alternative source of water if New York City's water use fees become prohibitively expensive.

Response #51: Backup water supply provisions (*e.g.*, quantity, yield, duration) would need to be formalized in a use agreement between the proposed water district and the NYCDEP, in accordance with the 1905 Water Supply Act.

EPA believes that the Catskill Aqueduct is a reliable long-term source of water. In cases of its unavailability, it should only be unavailable for short periods of time (less than one month).

Comment #52: A commenter noted that it would be necessary to determine the impact of operation of the extraction and treatment system off the MRIP property on a backup supply well, and recommended that the well be pumped for a significant length of time to determine if its use would draw contaminants to the well. It was suggested that the groundwater extraction and treatment system off the MRIP property operate before siting backup wells, in order to determine potential impacts of the groundwater extraction and treatment on the backup supply.

Response #52: The concern that contamination could be drawn into backup supply well(s) will be evaluated during the remedial design at which time additional pump tests will be performed. However, the siting of the backup supply and implementation of the alternate water supply cannot be postponed until after the groundwater pump and treatment system is operational because operation of the groundwater extraction and treatment system will cause significant water table drawdown which will lower the water levels in many of the private wells within the PWSA.

Comment #53: Who will perform sampling of backup wells?

Response #53: Sampling of the proposed backup well(s) would be conducted by the water district.

Comment #54: Would the fire department have adequate water supply under the aqueduct alternative while a backup supply is being used?

Response #54: Yes, the capacity of the water supply system would be designed to include the provision of fire flow service.

<u>Implementation of Groundwater Response and Source Control Alternatives</u>

Comment #55: The remedy only addresses the bedrock aquifer, but an overburden well (MW-4) contains the highest concentration of VOCs. The overburden aquifer will continue to act as a source of contamination to the underlying bedrock aquifer. Overburden contamination on the MRIP property should be fully defined and remediated through conventional extraction or high vacuum extraction and treatment.

Response #55: Based on the data collected during the RI/FS and during site characterization performed by EPA's Removal Program, the extent of contamination in the overburden and bedrock/overburden interface is limited in extent. Although the highest levels of VOCs have been found on the MRIP property in a well MW-4, this well is screened at the bedrock/overburden interface, and the closest downgradient bedrock/overburden well MW-5, which is within 100 feet of MW-4, is significantly less impacted, while the bedrock well (MW-5B) at this location contains higher levels of VOCs. This indicates that upon release into the overburden, the contaminants migrated into the bedrock aquifer without significant lateral movement. The clay-rich soil in the overburden likely inhibits lateral groundwater movement, which may account for the majority of contaminant movement occurring within the bedrock aquifer.

Comment #56: Concerns were raised regarding the locations of the groundwater extraction wells and treatment system and treatment plant. A commenter suggested that the location and appearance of extraction and treatment facilities should be addressed at this time.

Response #56: The location of the components of the extraction and treatment system was considered conceptually during the FS. Currently, it is anticipated that three to six extraction wells will be utilized to draw groundwater from the farfield plume, and that the treatment plant will be located near the Rondout Creek. However, the exact placement of the treatment system and extraction wells will be determined during the remedial design based an groundwater modeling results, the availability of property for the treatment plant, and other physical considerations (e.g., location of piping and extraction wells). As with the NTCRA system, EPA will take into account visual and aesthetic considerations when designing and constructing the air stripping system. EPA will discuss the proposed location and design with the community during the remedial design.

Comment #57: Will treatment technologies be dependent on the location of extraction and potable wells?

Response #57: No. The selection of the treatment technologies will be based on their demonstrated ability to remove contaminants.

Comment #58: Concerns were expressed regarding the frequency and accuracy of monitoring of the treated water, and who will be responsible for cost and oversight of long-term monitoring.

Response #58: EPA and NYSDEC will fund the operation of the groundwater extraction and treatment system (Alternative GR-3), including sampling the monitoring well network and the effluent from the treatment plant. The sampling frequency for the treated groundwater will be determined by NYSDEC along with the effluent discharge standards and requirements for discharge. The Rondout Creek discharge will likely be sampled weekly during startup and then monthly. Sampling data will be reviewed by EPA and NYSDEC staff.

Monitoring of the treated water from the drinking water treatment plant will be the responsibility of the proposed water district.

Sampling and analyses will be conducted according to EPA-approved methods and protocols.

Comment #59: Will water levels in private wells decrease as a result of the groundwater extraction and treatment system? What impact will the sustained pumping have on the water table in the vicinity of the water district?

Response #59: Private wells within the PWSA will likely be impacted by water table drawdown from the groundwater extraction and treatment system. This is why the groundwater remedy needs to be implemented concurrently with an alternate water supply remedy, namely, Alternative AWS-3. Based on groundwater modeling, drawdown is expected to be minimal outside of the PWSA. Additional modeling and monitoring will be performed during remedial design to confirm this projection.

Comment #60: How will EPA prevent contaminated groundwater from impacting homes not in the PWSA?

Response #60: The selected groundwater remedy, extraction and ex-situ treatment, will minimize the migration of the VOC plume. The proposed water district boundaries have been conservatively designed to include homes that are both threatened or impacted by the plume. Therefore, it is not anticipated that additional potable wells will be adversely impacted by VOCs in the future. In the event that homes outside the PWSA are found to be impacted or threatened by the VOC plume or water table drawdown from either the groundwater extraction and treatment system or backup supply wells, these homes would be provided an alternate water supply (either through connection of the property to the proposed water district, or through use of GAC filters).

Comment #61: What plans are in place to assure that the pumping of the NTCRA system does not dry up residential wells not included in the PWSA, or residential wells within the PWSA before the Alternate Water Supply is available? Whom do residents notify if they suspect that the pumping is affecting our water supply? Is a procedure for notification in place? What would happen if a homeowner's well is impacted by drawdown from the extraction and treatment system? If a monitoring program is implemented prior to formation of the water district, one commenter recommended monitoring the water levels of homes potentially impacted by pumping, so the pumping rate of the remediation system could be adjusted to minimize any impacts of drawdown.

Response #61: To prevent adverse impacts to residential water supplies, EPA has performed a well survey for residences within the zone of influence of the pumping wells on the MRIP property where groundwater modeling predicted greater than 15 feet of water level drawdown at simulated steady-state conditions. During the well surveys, EPA determined how deep the potentially impacted wells are, and where the pumps are located in the wells. EPA would like to ensure that there is at least 40 feet of water column between the pump and the water table to account for both drawdown and seasonal water level fluctuations. If there is less than 40 feet between the pump and the water table, with the resident's permission, EPA will reset the pump at the level necessary so that the drawdown will not impact it. If a pump cannot be set deep enough in a well to ensure 40 feet of water column above the pump, EPA would consider redrilling the well or installing a deeper well, based on actual drawdown conditions, or including the property within the PWSA. In the event that potable wells outside the PWSA are impacted by drawdown from the extraction and treatment system, the property would be considered eligible for inclusion in the PWSA.

In addition, EPA will monitor the drawdown by installing water level monitoring devices in the monitoring wells near Mohonk Road. It is expected that drawdown will continue over time until a steady-state water table level is reached. The maximum estimated drawdown in the closest residential well is expected to be approximately 20 feet based on a groundwater extraction model simulating steady-state conditions. Initially, the drawdown at this well is expected to be substantially less than 20 feet, and it would take several years to reach this level of steady-state drawdown. Therefore, there will be sufficient time to monitor the drawdown levels and reduce the rates of extraction prior to any adverse impact on nearby wells.

EPA intends to hold periodic meetings in the community to update residents on the progress of activities and afford them an opportunity to express concerns. Fact Sheets or written updates will also be prepared and provided to the public. Future questions and comments should be directed to EPA's Project Manager for the MRIP Site, who is currently Patrick Hamblin and who may be reached at (212) 637-3314.

Comment #62: How long will it take to clean up the aquifer?

Response #62: Preliminary estimates based on groundwater modeling indicate that it would take on the order of several decades to remediate the plume. Additional modeling will be performed during the remedial design; a more refined estimate of the time required to remediate the aquifer will be prepared at that time.

Comment #63: In light of the discovery of the paint waste area by EPA's Removal Program, a commenter recommended that additional investigation such as a review of historical aerial photographs and a Site-wide geophysical survey be conducted to find other potential source areas.

Response #63: EPA has conducted both historical aerial photo analysis and additional geophysical studies of the Site. Based on the results of the aerial analysis, a large part of the MRIP property has been geophysically surveyed. The paint waste disposal area was identified as a result of the aerial analysis and subsequent geophysical studies and exploratory trenching efforts further defined the area. These efforts identified small disposal pits near the paint waste disposal area. The total volume of contaminated soil remaining in these areas is approximately 300 cubic yards, and will be excavated as part of Source Control Alternative SC-3. Additional characterization of this area will be performed during the remedial design.

Comment #64: There is no rationale in the Proposed Plan for not addressing contaminated soils from Areas 1C and 2A identified by NYSDEC.

Response #64: During NYSDEC's Site investigations, Areas 2A and 1C were found to be significantly less contaminated than Areas 1B, 1A, 2B, and the paint waste disposal area, and only slightly exceeded the cleanup values of NYSDEC Technical and Administrative Guidance

Memorandum #4046 (TAGMs). For example, of the samples taken near Area IC, only one exceeded the TAGM values for TCA (1.1 ppm was detected, compared to the TAGM value is 0.8 ppm). Further sampling will be performed during the remedial design to confirm that these soil areas are not significantly impacted, and, therefore, do not need to be remediated.

Comment #65: A commenter noted that standard practice is to cover stockpiled contaminated soil with plastic sheeting to minimize potential runoff from precipitation events, and that if soil is stored in rolloff containers, the containers should be lined to minimize leaks.

Response #65: This is the current practice on the Site, and it will be followed for later excavations.

Miscellaneous

Comment #66: Commenters want assurances that EPA will acknowledge and protect important historic resources in the area.

Response #66: The National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470), sets forth a mandate for protection of the cultural environment. Under the NHPA, federal agencies must take into account possible effects of their actions on properties on, or eligible for, inclusion in the National Register of Historic Places. As part of the RI/FS activities, NYSDEC performed a Stage 1A Cultural Resource Assessment: Literature Search and Sensitivity Study. This is the first component of the review process to determine whether cultural resources could be impacted as a result of the selected remedial actions at the Site. The report concluded that if the proposed water mains were installed within three feet of existing pavement or in other areas previously disturbed, it is likely that an archeological survey would not be necessary. However, this evaluation focused primarily on the components of the NTCRA, and further review will be conducted during the remedial design. As part of this process, the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO) would be consulted to make a determination of any potential impact to cultural resources, and should any impact be identified, mitigation measures would to be taken to reduce these impacts.

Comment #67: How will property taxes be impacted as a result of the Site or water district?

Response #67: Property taxes are controlled by local governing bodies, and as a result, there is no federal involvement in property taxation.

Comment #68: A commenter noted that Fourth Street is included on some of the project maps of the area, which no longer exists.

Response #68: Comment noted; the most recent maps prepared by EPA do not include Fourth Street north of Route 213.

Comment #69: Are the granular activated carbon systems currently on the impacted residential wells effective at removing vinyl chloride?

Response #69: Granular activated carbon filters are effective at removing vinyl chloride, but to a lesser extent than some other VOCs. Vinyl chloride is not a primary contaminant of concern at the Site, but may be present due to the breakdown of other contaminants. To date, no breakthrough of vinyl chloride has been observed in the GAC systems.

Comment #70: Development outside of the PWSA, which may require the use of private wells, should be addressed in the long-term institutional controls developed for the overall remediation plan.

Response #70: See Responses #20, 61, and 63.

Comment #71: How does this Site compare with the Napanoch Site cleanup?

Response #71: Cleanup of the Napanoch paper mill site, located in Wawarsing, New York, near the Rondout Creek, is being addressed by NYSDEC cleanup activities. This site is contaminated with polychlorinated biphenyls (PCBs). This Site differs from the MRIP Site, in that the RI/FS did not identify groundwater contamination at the Napanoch site, and the contaminants of concern differ. The Record of Decision for this site, signed in 1994, consists of off-site disposal of paper rolls and removal of contaminated soils and sediments.

RESPONSIVENESS SUMMARY

Appendix A - Proposed Plan

MOHONK ROAD INDUSTRIAL PLANT SITE

Hamlet of High Falls, Ulster County, New York
Site No. 3-56-023

PROPOSED REMEDIAL ACTION PLAN

November 1999

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

PROPOSED REMEDIAL ACTION PLAN

MOHONK ROAD INDUSTRIAL PLANT SITE

Hamlet of High Falls, Ulster County, New York
Site Number 3-56-023

November 1999

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

This Proposed Remedial Action Plan (PRAP) was developed by the New York State Department of Environmental Conservation (NYSDEC), as lead agency, with support from the U.S. Environmental Protection Agency (EPA), the New York State Department of Health (NYSDOH) and the Ulster County Health Department (UCHD). In January 1999, the Mohonk Road Industrial Plant (MRIP) site (the Site) was listed on EPA's National Priorities List (NPL). The EPA will be the lead agency for the remedial design and remedial construction phases of the project.

The NYSDEC, in consultation with the EPA, NYSDOH and UCHD, is proposing a remedy to address the significant threat to human health and the environment created by the presence of hazardous wastes at the Site. (The Federal Superfund law or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended (42 U.S.C. §§ 9601-9675) authorizes EPA to respond to releases or threatened releases into the environment of hazardous substances, pollutants, or contaminants. Hazardous substances include hazardous waste.)

The NYSDEC has issued this PRAP as a component of the citizen participation plan, developed pursuant to the New York State Environmental Conservation Law (ECL) and 6 NYCRR Part 375. EPA has similar public participation responsibilities under Section 117(a) of CERCLA and the National Contingency Plan (NCP), 40 C.F.R. § 300.430(f).

Written comments on the PRAP can be submitted until January 15 2000 to Patrick Hamblin, Project Manager, EPA at the following address:

EPA
Emergency & Remedial Response Division
290 Broadway, 20th Floor
NY, NY 10007-1866
Phone: (212) 637-3314
Fax: (212) 637-3966

This document is a summary of the information that can be found in greater detail in the Remedial Investigation/Feasibility Study (RI/FS) and other relevant reports and documents, which are available at the NYSDEC and EPA document repositories referenced below. A summary of the preferred remedy is given in Section 8 of this document.

As described in Sections 3 and 4 of this document, improper handling and disposal of waste solvents resulted in the release of hazardous wastes (primarily 1,1,1-trichloroethane, also known as 1,1,1-TCA, and trichloroethene, also known as TCE) at the MRIP property. Some of this material has migrated from the MRIP property to surrounding areas, including to the underlying bedrock aquifer. These disposal activities have resulted in the following significant threats (actual or potential) to human health:

- a significant threat to human health associated with the ingestion, inhalation and direct contact with volatile organic compound (VOC) contaminated bedrock groundwater, on and off the MRIP property, above New York State and/or Federal drinking water standards; and

- a significant threat to human health associated with the ingestion, inhalation and direct contact with contaminated subsurface soils by workers on the MRIP property.

In order to restore the Site to pre-disposal conditions to the extent feasible and authorized by law and, at a minimum, to eliminate or mitigate the significant threats to the public health that the hazardous waste disposed at the MRIP property has caused, the following remedy is proposed:

- The construction of a new public water supply system to provide clean and safe potable water to the residences in the Hamlet of High Falls and the Towns of Rosendale and Marbletown with impacted or threatened private supply wells.

- The continuation of the NYSDEC Interim Remedial Measure (IRM) to monitor and maintain the individual granular activated carbon (GAC) filtration systems in use until the new public water supply system is fully operational.

- Continued operation of EPA's Non-time Critical Removal Action (NTCRA) which includes the extraction and treatment of contaminated bedrock groundwater on the MRIP property.

- The excavation and off-Site disposal of approximately 200 cubic yards of contaminated subsurface soils remaining at the MRIP property. Additional soil sampling will be conducted during the Remedial Design (RD) to further refine this estimate and determine if additional soils need to be excavated. A paint waste area, approximately 300 cubic yards in volume, that was recently identified by EPA's Removal Program would also be excavated, treated (if necessary), and disposed of off-Site if the area is not addressed by EPA's Removal Program.

- Capture and treatment of VOCs in the groundwater plume off the MRIP property.

- Long-term groundwater monitoring.

The proposed remedy, discussed in detail in Section 7 of this document, is intended to attain the remedial action objectives selected for the Site, in conformity with New York State applicable standards, criteria and guidance (SCGs), as identified in Section 6. Under Section 121(d) of CERCLA, 42 U.S.C. Section 9621(d), EPA is required to attain legally applicable or relevant and appropriate Federal and State requirements, standards, and criteria when implementing remedial actions at CERCLA sites, unless such ARARs are waived under CERCLA section 121(d)(4). These requirements are collectively referred to as Applicable or Relevant and Appropriate Requirements (ARARs). EPA also uses "to be considered" (TBCs), that include nonbinding criteria, advisories, guidance, and proposed standards. SCGs include all applicable Federal ARARs and TBCs.

This PRAP identifies the preferred remedy, summarizes the other alternatives considered and discusses the reasons for this preference. **NYSDEC and EPA will select a final remedy for the Site only after careful consideration of all comments received during the public comment period.** Any remedy selected will include both performance and environmental monitoring along with periodic reevaluation of the effectiveness of the selected remedy and the need for further action, if any.

To better understand the Site and the investigations conducted, the public is encouraged to review the project documents at the following repositories:

NYSDEC Central Office
Attention: Michael Komoroske
50 Wolf Road, Albany, NY 12233-7010
Phone (518) 457-3395
Hours Mon. through Fri., 8:00 to 4:45

NYSDEC Region 3 Office
Attention: Michael Knipfing
21 South Putt Corners Road
New Paltz, NY 12561
Phone (914) 256-3154
Hours Mon. through Fri., 8:30 to 4:45

EPA Region 2 Office
Attention: Patrick Hamblin
Emergency & Remedial Response Division
290 Broadway, 20th Floor
NY, NY 10007-1866
Phone: (212) 637-3314

NYSDEC and EPA Information Repositories:
Stone Ridge Library
Stone Ridge, New York 12484
Phone: (914) 687-7023
Hours: Mon & Wed, 1:30-8:00; Tue, Thu & Sat, 10:00-5:30; Fri, 1:30-5:30; Sun, closed

Rosendale Library
264 Main Street, Rosendale NY 12472
Phone: (914) 658-9013
Hours: Mon, Tue & Thur, 11-7:30; Wed & Fri, 11-5, Sat, 10-3; Sun, Closed

DATES TO REMEMBER:

November 15, 1999 to January 15, 2000 - Public comment period on the RI/FS Report, PRAP and preferred alternative. Since a extension request has already been received, the normal 30 day comment period has been extended to 60 days.

Thursday December 2, 1999, 7:00 pm - Public meeting at the High Falls Firehouse, High Falls, New York

A public meeting will be held to present the findings of the FS along with a summary of the proposed remedy. After the presentation, a question and answer period will be held, during which verbal or written comments can be submitted on the preferred remedy. Written comments can be submitted at any time during the public comment period.

Based on new information or public comments, the preferred alternative may be modified or another of the alternatives presented in this PRAP may be selected. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

Comments will be summarized and responses provided in the Responsiveness Summary section of the Record of Decision (ROD), which will be issued by EPA and will represent NYSDEC and EPA's final decision regarding the selected remedy after careful consideration of all public comments.

SECTION 2: SITE LOCATION AND DESCRIPTION

The MRIP property is located on Mohonk Road in High Falls, Ulster County (see Figure 1). The MRIP property is approximately 14.5 acres, most of which is undeveloped. The MRIP property is bounded on the southeast by Mohonk Road and to the northeast, northwest, and southwest by residential properties on large wooded lots. The MRIP property (see Figure 2) is mostly undeveloped except for the southern corner of the property, which is occupied by an approximately 43,000 ft^2 building. A 6,000-gallon fuel oil underground storage tank (UST) and a 1,000-gallon underground disposal tank were located to the north of the building. The 6,000-gallon fuel oil UST was removed in 1992 by a previous owner. The NYSDEC removed the 1,000 gallon underground disposal tank as an IRM in August 1997. See Figure 2.

The surrounding area is rural in nature and relies exclusively on groundwater as a source of potable water. The Rondout Creek, a Class B water body, flows approximately 3,000 feet to the north and west of the MRIP property. The best usages of Class B surface waters are primary and secondary contact recreation and fishing and are suitable for fish propagation and survival. The Coxing Kill, a Class C(T) water body, flows approximately 2,000 feet to the east of the MRIP property. The best usage of Class C waters are fishing and these waters are suitable for fish propagation and survival.

SECTION 3: SITE HISTORY

3.1 Operational/Disposal History

The structure on the MRIP property has been used as a manufacturing facility since at least the early 1960s when a metal finishing company, Varifab, Inc. moved into the building. Varifab reportedly used TCE in the finishing and assembly of metal parts for computer card punch machines and computer frames. Consolidated Diesel purchased Varifab and the property in about 1969 and continued and expanded metal fabrications operations there until approximately 1972. The facility was purchased by the R.C.

Ballard Corporation in 1972 which conducted a wet spray operation there. This type of painting operation would require large quantities of solvents in order to clean surfaces prior to painting. The property was again sold in 1975 to a Richard C. Wilson who conducted unknown operations there for approximately six months. In 1976, the property was purchased by Gelles Associates, which manufactured metal and wood store display fixtures. In 1992, the Banco Popular of Puerto Rico repossessed the property. In 1993, the property was purchased by the Kithkin Corporation and is currently leased to a company that makes sets for the movie and TV industry.

In 1994, a resident on Mohonk Road contacted the UCHD concerning the quality of her drinking water. The well was sampled and found to contain VOCs above the NYSDOH drinking water standards. These VOCs included: 1,1,1-TCA at 290 parts per billion (ppb); TCE at 26 ppb; 1,1-dichloroethylene (1,1-DCE) at 76 ppb; and 1,1-dichloroethane (1,1-DCA) at 22 ppb. Concentrations of total VOCs exceeding 1,000 ppb have been detected in other residential wells. The NYSDOH drinking water standard is 5 ppb for each of these compounds. Other wells in the area were sampled and many were also found to be contaminated with VOCs. Beginning in April 1994, at the request of the health departments, the NYSDEC installed GAC filtration systems on residential, municipal and commercial property water supply wells whose water contains VOCs above the NYSDOH drinking water standard. The NYSDEC is currently monitoring and maintaining 70 GAC filtration systems as an IRM.

The NYSDEC identified the MRIP property as the source of the contamination, and in August 1994, the MRIP property was designated a Class 2 site on the New York State Registry of Inactive Hazardous Waste Disposal Sites. The Class 2 designation indicates that the site poses a significant threat to public health and/or the environment. The Site was listed on the Federal National Priorities List (NPL, also known as Superfund) of hazardous waste sites on January 19, 1999.

3.2 Remedial History/Previous Investigations

After repeated, unsuccessful attempts to have a responsible party fund a full remedial program at the Site, the NYSDEC in 1996 elected to use the State Superfund program to conduct the work. In the Fall of 1996, the NYSDEC and their consultant conducted an Immediate Investigation Work Assignment (IIWA). A sample from the 1,000-gallon underground disposal tank on the MRIP property indicated an estimated concentration of 1,1,1-TCA at 26% and 1,1-DCE at 1.8% in the sludge at the bottom of the tank. Since the 1,000-gallon tank was determined to be the primary source of the VOC contamination in the groundwater, the NYSDEC elected to remove the tank as an IRM in August 1997 (see Figure 2). The tank was removed along with about 25 tons of contaminated soil from beneath the tank and properly disposed of off-Site to prevent additional contamination from entering the groundwater. No residual contamination was detected in the location of the former 6,000-gallon fuel oil storage tank. As part of the IIWA, five shallow soil/bedrock interface monitoring wells were installed on the MRIP property. Analysis of groundwater sampled from monitoring well MRMW-4 located near the 1,000-gallon underground disposal tank detected the presence of 1,1-DCE at 10,000 ppb; 1,1-DCA at 6,700 ppb; TCE at 3,300 ppb; and 1,1,1-TCA at 82,000 ppb. Four bedrock monitoring wells were installed and sampled on the MRIP property under a second IIWA in April 1997.

The NYSDEC requested that EPA's Removal Program construct a groundwater extraction and treatment system on the MRIP property, in order to minimize the migration of the most highly contaminated portion of the groundwater plume. This Removal Action will extract the contaminated groundwater and treat it on the MRIP property using an air stripper. The clean, treated water will be discharged to a nearby surface water stream in accordance with effluent criteria issued by the NYSDEC. EPA has classified this work as a NTCRA. The EPA issued and solicited comment on an Engineering Evaluation/Cost Analysis (EE/CA) that described the rationale for the NTCRA. EPA's responses to the comments received were summarized in a Responsiveness Summary. The Responsiveness Summary was included in an Action Memorandum, the decision document that substantiated the need for a removal action at the Site, which was finalized in June 1999. The design for the NTCRA is nearing completion and preliminary mobilization at the MRIP property occurred in July 1999; construction of the treatment system is anticipated to be completed in the late Fall of 1999.

3.3 Scope and Role

Cleanup at the Site is currently being addressed with 3 actions:

- New York State's interim remedial measures,
- EPA's NTCRA,
- and the long-term remediation plan.

This proposed plan describes the alternatives for the long-term remediation of the Site. New York State's interim actions addressed immediate health threats through the installation of GAC filters on impacted homes and businesses, and removal of the suspected source of contamination. EPA's NTCRA is designed to minimize the further migration in the bedrock aquifer of the most highly contaminated portion of the groundwater plume.

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the Site and to evaluate alternatives to address the significant threat to human health posed by the presence of hazardous waste, the NYSDEC has recently completed a RI/FS.

4.1 Summary of the Remedial Investigation (RI)

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the MRIP property. The initial RI work was conducted between March 1997 and December 1997. A draft RI Report was issued in March 1998. Additional RI field activities occurred between April 1998 and June 1998. A final RI Report was issued in September 1998.

The RI included the following activities:

- private water well survey;
- soil probe borings and soil sampling;
- test pit excavation and subsurface soil sampling;

- tracing drain lines from the building to determine additional contamination source areas on the MRIP property;
- surface water sampling;
- groundwater monitoring well network installation and sampling off the MRIP property;
- groundwater elevation and flow data;
- groundwater pumping tests;
- human health exposure assessment;
- habitat assessment; and
- completion of a RI Report

To determine which media (soil, groundwater, air, etc.) contain contamination at levels of concern, the RI analytical data were compared to the SCGs and ARARs. Groundwater, drinking water and surface water standards identified for the Site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of NYS Sanitary Code, as well as Federal Safe Drinking Water Act 40 CFR Part 141 et.seq., maximum contaminant levels (MCLs) for drinking water. For soils, NYSDEC TAGM 4046 provides soil cleanup objectives for the protection of groundwater, background conditions and health-based exposure scenarios.

Chemical concentrations for water and soil are reported in parts per billion (ppb) and/or parts per million (ppm). For comparison purposes, SCGs are defined for each media.

4.1.1 Nature and Extent of Contamination

Based upon the results of the RI, soils and groundwater at the Site require remediation. These results are summarized below. More complete information can be found in the RI Report which is available at the information repositories.

4.1.1.1 ***Surface Soils*** - Historical sampling did not detect any contaminants of concern (COCs) in the surface soils on the MRIP property. Recently, EPA's Removal Program discovered a potential waste disposal area which is near the surface, which is discussed in the following section.

4.1.1.2 ***Subsurface Soils*** - Samples were collected by using a direct push soil sampler and through the excavation of test pits and trenches. The excavations uncovered drain lines originating from inside the north and west sides of the building. Subsurface soils samples were also collected from three locations inside the building. The subsurface soil data indicate that contaminated soils remain in the vicinity of the former 1,000-gallon underground disposal tank north of the building, in an area just west of the building, and in a small area under the building. Contaminants that were found above SCGs include 1,1,1-TCA at 4.6 ppm with a cleanup objective of 0.800 ppm, TCE at 0.730 ppm with a cleanup objective of 0.700 ppm, DCA at 1.3 ppm with a cleanup objective of 0.200 ppm, perchloroethylene (PCE) at 25 ppm with a cleanup objective of 1.4 ppm, ethyl benzene at 61 ppm with a cleanup objective of 5.5 ppm and xylene at 570 ppm with a cleanup objective of 1.2 ppm. Although the subsurface soils pose no risk to children or adult residents since they are not accessible, they do pose a risk to construction workers or workers on the MRIP property who may come in contact with them during future excavations. In addition, these soils have the potential to impact groundwater through the leaching of the VOCs into the groundwater. In total, there are approximately 200 cubic yards of contaminated subsurface soils that would need to be addressed, as shown in Figure 3. Additional soil sampling would be conducted during the RD to refine this estimate.

In addition to the subsurface soil contamination found during the RI, EPA and NYSDEC recently discovered an additional disposal area at the Site. In May 1999, the EPA Removal Program performed a geophysical survey followed by development of test pits which identified a potential disposal area, approximately 300 cubic yards in volume, about 75 feet north of the northwest corner of the building on the MRIP property. This area was found to contain paint wastes, and samples from the area were found to contain elevated levels of paint-related compounds including toluene, ethylbenzene, xylenes, isopropylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, lead and naphthalene. This work is detailed in an EPA Trip Report titled Exploratory Trenching at the Mohonk Road Industrial Site, dated June 28, 1999. EPA is currently assessing whether this disposal area can be addressed using its removal authorities. If it is not addressed as a removal action, it will be addressed as part of the soil remediation program discussed in this PRAP. This report is available at EPA's information repositories.

4.1.1.3 *Surface Water* - Samples were collected from various ponds and other water bodies downgradient of the MRIP property. With the exception of the cistern located just north and downgradient of the MRIP property, none of the samples were contaminated with Site-related contaminants. The cistern was 10-12 feet in depth and contained approximately a foot of water at the bottom. This water was more reflective of the shallow soil/bedrock interface groundwater than surface water. The sample contained 1,1,1-TCA at 43 ppb and DCE at 4 ppb, which is consistent with nearby soil/bedrock interface monitoring well MRMW-5 on the MRIP property.

4.1.1.4 *Groundwater* - Monitoring wells were installed off the MRIP property to provide subsurface geologic data and to allow monitoring of groundwater elevations and quality. This information was necessary to evaluate the direction of groundwater flow and to characterize the extent of the groundwater contaminant plume. In addition to the wells installed on the MRIP property in the Fall of 1996 and Spring of 1997, eleven monitoring wells have been installed off the MRIP property and sampled as part of the RI. The most recent complete monitoring well sampling event was in October 1998. Another complete groundwater sampling event occurred in October 1999. See Table 1 for the groundwater sampling results.

In the Hamlet of High Falls, the Shawangunk fractured bedrock aquifer is the principal source of drinking water. Water movement through this formation is characterized by a series of distinct, structurally controlled, locally interconnected fracture systems. This aquifer is recharged directly by precipitation on exposed bedrock areas and by infiltration through the overburden material. The soil or overburden groundwater is limited and is not widely used as a source of potable water. The MRIP property is found near a topographical high and serves as a recharge area for the bedrock aquifer. Vertical flow gradients at the MRIP property are clearly downward. Groundwater flow direction in the bedrock aquifer is predominantly to the north toward the Rondout Creek, but also showed components of flow to the northeast toward the Coxing Kill and northwest toward the Rondout Creek. There are a number of springs in the area which are used as sources of water by some residents. Sampling indicates that these springs are not contaminated by site related COCs. Artesian or upward groundwater flow has been observed in monitoring well MRMW-13B and has also been reported in residential wells along Berme Road near the Rondout Creek (see Figure 4.)

The shallow soil/bedrock interface monitoring well MRMW-4 on the MRIP property is located next to the location of the former 1,000-gallon underground disposal tank. As discussed earlier, this well is significantly impacted by VOCs. Soil/bedrock interface monitoring well MRMW-5 is located less than 100 feet downgradient of MRMW-4 and is significantly less impacted, with 1,1,1-TCA at 51 ppb in the December 1997 sampling round. No VOCs above the 5 ppb groundwater standard have been detected in soil/bedrock interface well MRMW-11 located further downgradient. This indicates that the contamination is moving vertically downward on the MRIP property directly into the underlying bedrock aquifer. VOCs have not been detected in samples collected from springs in the area.

The extent and concentration levels of the bedrock groundwater contamination are depicted in Figure 5. The Site-related COCs found in the bedrock aquifer include 1,1,1-TCA, TCE, DCE and DCA. 1,1,1-TCA was detected at 4,100 ppb in monitoring well MRMW-5B on the MRIP property in the October 1998 sampling round. In this same round of sampling, 1,1,1-TCA was detected at 150 ppb in monitoring well MRMW-12B and at 210 ppb in monitoring well MRMW-15B, which are both located off the MRIP property approximately 1,600 feet downgradient from the location of the 1,000-gallon underground tank which has been removed and is considered a former source of contamination. The groundwater standard for 1,1,1-TCA is 5 ppb. A residential supply well approximately 1,000 feet from the source area has consistently had concentrations of total VOCs at greater than 1,000 ppb. The VOC contamination is found throughout the vertical extent of the bedrock aquifer due to the interconnection of the bedrock fractures. Monitoring well MRMW-11B was drilled to a depth of 181 feet and 1,1,1-TCA was detected at 540 ppb in the May 1998 sampling round. The "nearfield plume" has been defined as having concentrations of total VOCs at greater than 1,000 ppb. The "farfield plume" is defined as having concentrations of total VOCs less than 1,000 ppb. Based on the May 1998 sampling data, the nearfield plume is estimated to have an area of approximately 6.3 acres and the total plume an area of 170 acres. The Site-related groundwater plume extends over 4,000 feet from the MRIP property and has impacted 70 residential, commercial and municipal water supply wells.

4.1.1.5 *Aquifer Testing* - A 45-hour pump test was conducted on a production well PW-2 located on the MRIP property to determine if sufficient drawdown and hence capture of the plume could be achieved through pumping of the aquifer. The pump test indicated that the well could achieve a high rate of pumping, although significant localized drawdown of the water table occurred. A second pump test was conducted on MRMW-11B and the results were similar to the first test. Based on the pump test results and water level measurements, the average linear groundwater velocity in the bedrock aquifer was calculated to be approximately 0.26 feet/day (95 feet/year). Assuming that the waste disposal began approximately 35 years ago, the groundwater velocity or flow accounts for a large portion of the noted movement of the plume. The data from the two pump tests has been used to develop and calibrate a groundwater model of the plume.

4.1.1.6 *Groundwater Flow Model* - In order to better evaluate alternatives for alternate water supplies (AWS) and/or plume control systems, a groundwater flow model was developed as part of the FS. The modeling study was used to predict the effect the groundwater pump and treat systems would have on the continued use of private individual wells as a water source; to evaluate plume migration; and the response of the bedrock aquifer to any of the potential alternative water supply scenarios. The modeling study included the development of a conceptual model of the hydrogeologic system, selection of the appropriate computer codes, model design and calibration, predictive simulation, and presentations of modeling design and results. Two groundwater model simulations were conducted involving the NTCRA extraction wells on the MRIP property; these models are described below. Important conclusions drawn from the model simulations include the following:

- Under steady-state conditions (continued use of the community private wells and no groundwater extraction and treatment system operating), the model suggests that the VOC contaminants in the groundwater will travel outside of the current plume boundary and possibly impact the Rondout Creek and the Coxing Kill. See Figure 13.

- If a public water system is installed to service only properties with wells currently impacted and no active remedial actions (i.e., groundwater extraction and treatment) are taken at the Site, the groundwater model simulations suggests that a section of residences north of Route 213 will be impacted by the contaminant plume as well as a group of residences south of Route 213 near Rondout Creek.

In the first groundwater model scenario, the wells installed as part of the NTCRA were modeled as pumping at a total of 40 gallons per minute (gpm) and all residential wells within the model domain were also pumping. For the second scenario, the NTCRA wells were again modeled as pumping at a total of 40 gpm but the residential wells were assumed turned off. As would be expected, both simulations indicate that a portion of the plume near the MRIP property would be contained by the NTCRA wells. When the NTCRA wells were assumed to be pumping and the residential wells remained on (or pumping) (scenario 1), the simulation indicates a significant portion of the northern end of the farfield plume would be drawn into residential wells, while the leading edge of the plume would reach the Rondout Creek in roughly three years. In the second scenario, which assumed the residential wells would not be pumping, the plume would continue to migrate and reach the Rondout Creek in approximately one year. In other words, if a public water system remedy was implemented and the existing impacted and threatened private wells were taken out of service, without an aquifer-wide groundwater response action, the groundwater plume would be expected to migrate further and possibly impact the Rondout Creek and the Coxing Kill.

EPA performed additional groundwater modeling to determine optimal rates of groundwater extraction for the NTCRA. This modeling is described in a June 15, 1999 Technical Memorandum, which is available at EPA's information repositories.

4.1.1.7 *Human Health Exposure Assessment* - The assessment was conducted by the NYSDEC to provide a qualitative assessment of the health risks to humans under current and future land-use scenarios. The assessment concluded that the primary routes of exposure and most significant exposure intakes under a current land use scenario are inhalation of VOCs from groundwater (via showering) by residents off the MRIP property, followed by ingestion of groundwater by workers on the MRIP property and ingestion of groundwater by local residents (primarily children) off the MRIP property. It is important to note that the use of the GAC filtration systems has eliminated these exposure pathway and ensures a safe supply of water for those wells which are currently impacted. Under a future-use scenario, the local residents have the greatest exposure to COCs from the Site, with inhalation accounting for the most significant amount of COC intake. The exposure assessment considers the amount of exposure to chemicals from the Site and does not equate to the potential risk from exposure, which is dependent on a chemical's toxicity and is discussed below.

EPA Risk Assessors quantified the estimated risk based on the Human Health Exposure Assessment. The results are discussed in Section 4.3 below, and are available for review at the EPA information repositories for the Site (EPA Memorandum, dated October 20, 1999).

4.1.1.8 *Fish and Wildlife Impact Analysis* - A Step 1 Analysis of the Site was conducted following the guidelines issued by the NYSDEC. The analysis is presented in Chapter 8 of the RI Report. Although the impact analysis concluded there was no current impact to fish and wildlife resources, without an active groundwater response the plume could migrate and potentially impact fish and wildlife resources.

A RI Report was prepared that summarizes the findings of the RI and is available for review at the project document repositories listed in Section 1.

4.2 Interim Remedial Measures

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

In addition to the installation of the GAC filtration systems IRM, and as discussed in Sections 3.1 & 3.2 of this document, an underground tank excavation and removal IRM was performed in September 1997. The design and construction of a contaminated groundwater extraction and treatment system on the MRIP property as a NTCRA is ongoing. Preliminary mobilization at the MRIP property occurred in July 1999 and construction of the treatment system is anticipated to be completed in late fall 1999.

4.3 Summary of Human Exposure Pathways

This section describes the types of human exposures that may present added health risks to persons at or around the MRIP property. A baseline risk assessment was conducted by EPA based upon the results of the Human Health Exposure Assessment conducted in the RI, and an analysis of residents in the nearfield plume, in order to estimate the risks associated with current and future Site conditions. The baseline risk assessment estimates the human health risk which would result from the contamination at the Site if no remedial action were taken, and the currently operating GAC filters were not in use. A more detailed discussion of the Human Health Exposure Assessment and the baseline risk assessment can be found in Chapter 7 of the RI Report, and in an EPA Memorandum dated October 20, 1999, respectively.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification* – identifies the contaminants of concern at the Site based on several factors such as toxicity, frequency of occurrence, and concentration. *Exposure Assessment* – estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water by which humans are potentially exposed.) *Toxicity Assessment* – determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). *Risk Characterization* – summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks.

Current Federal guidelines for acceptable exposures are an individual lifetime excess carcinogenic risk in the range of E-04 to E-06 (e.g., a one-in-ten-thousand to a one-in-one-million excess cancer risk) and a maximum health Hazard Index (HI) (which reflects noncarcinogenic effects for a human receptor) equal to 1.0. (A HI greater than 1.0 indicates a potential of noncarcinogenic health effects).

The results of the baseline risk assessment indicate that the groundwater at the Site poses an unacceptable risk to human health. These calculations assume the currently operating GAC filters are not in use.

Under current use scenarios, the carcinogenic risk for the adult worker on the MRIP property through ingestion and inhalation (via showering) of groundwater is 4.6E-04, which is at the upper bound of EPA's acceptable level. The HI for workers on the MRIP property under current use scenarios is 1.3, which exceeds EPA's acceptable level for noncarcinogenic health effects. Estimated carcinogenic risk to adults off the MRIP property in the nearfield plume under current and future use scenarios is 6.4E-4 for adults, which exceeds EPA's acceptable level for carcinogenic risk. Estimated carcinogenic risk to children off the MRIP property in the nearfield plume is 4.4E-04 for children, which is at the upper bound of EPA's acceptable risk level. The HI for adults and children off the MRIP property in the nearfield plume under current and future use scenarios is 0.38 and 0.94, respectively.

Actual or threatened releases of hazardous substances from this Site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health or welfare.

4.4 Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures which may be presented by the Site. The Fish and Wildlife Impact Assessment included in the RI presents a more detailed discussion of the potential impacts from the Site to fish and wildlife resources. Although the RI impact assessment did not identify currently existing pathways for significant exposures to fish or wildlife, without an active groundwater response the plume could migrate and potentially impact fish and wildlife resources.

SECTION 5: <u>ENFORCEMENT STATUS</u>

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the Site identified to date by NYSDEC include the current owner of the MRIP property, the Kithkin Corporation, and a number of previous owners of the MRIP property including the Banco Popular of Puerto Rico, Gelles Associates, Richard C. Wilson, the R.C. Ballard Corporation, Consolidated Diesel and Varifab, Inc.

The PRPs failed to perform the RI/FS at the Site when requested by the NYSDEC. EPA has noticed the Kithkin Corporation, Daniel Gelles, and Gelles Associates Inc. of their potential liability at the Site. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. The PRPs are subject to legal actions by the State and/or EPA for recovery of all response costs the State and/or EPA have incurred.

SECTION 6: <u>SUMMARY OF REMEDIAL ACTION OBJECTIVES & GOALS</u>

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 SCGs.

Goals for the remedial program have been established through the remedy selection process. The overall remedial objective is to meet all SCGs, including Federal ARARs as described above, and be protective of human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment through the proper application of scientific and engineering principles. The RAOs selected for this Site are as follows:

- Eliminate the inhalation, ingestion and dermal contact of contaminated groundwater associated with the Site that does not meet State or Federal drinking water standards.
- Restore the bedrock aquifer to its best beneficial use.
- Eliminate the potential for human exposure to subsurface contaminated soil on the MRIP property. Contaminated Site soil cleanup objectives for COCs would be based on NYSDEC's Technical and

Administrative Guidance Memorandum (TAGM).

- Eliminate further off-Property contaminated bedrock groundwater migration and impacts.
- Eliminate the potential for any further contaminant discharges on the MRIP property.

The contaminant and media-specific SCGs are presented in Table 1.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost-effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Site were identified, screened and evaluated in a FS, dated March 1999. Since contamination from the Site consists of VOCs, the FS utilized EPA's Office of Solid Waste and Emergency Response Directive 9283.1-12 - Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites to identify remedial alternatives.

A summary of the remedial alternatives follows. As used in the following text, the time to implement reflects only the time required to construct the remedy and does not include the time required to design the remedy, to procure contracts for design and construction or to negotiate with PRPs for implementation of the remedy. All of the groundwater response alternatives assume a long-term groundwater monitoring program of up to 30 years.

7.1 Description of Alternatives

The potential remedies were developed to achieve the established RAOs for the contaminated media at the Site, specifically the VOC-contaminated groundwater plume and soils. Alternatives for each medium are discussed and evaluated separately. The alternatives discussed below may vary in title and description from those identified in the FS.

Potable Water Supply Alternatives

AWS 1 No Further Action

Present Worth:	$ 0
Capital Cost:	$ 0
Annual O&M:	$ 0
Time to Implement:	0 years

The no further action alternative is evaluated as a procedural requirement and as a basis for comparison. It includes no active remedial measures and discontinuation of monitoring and maintenance of the 70 currently operational point of use (POU) GAC systems for private well owners after the current service contract for these filters expires. After the service contract expires on February 26, 2001, further maintenance of these systems would be the responsibility of the homeowner.

AWS 2 Installation and Maintenance of Additional GAC Filter Systems

Present Worth:	$5,319,000
Capital Cost:	$384,000
Annual O&M:	$321,000
Time to Implement:	3 months

Alternative AWS 2 includes installation and maintenance of a GAC system for all of the private well owners in the proposed public water service area (PWSA) that are currently not on GAC filters (approximately 73 more systems), and continued monitoring and maintenance of the 70 currently operating POU GAC systems.

The PWSA is depicted in Figure 6 and includes all properties currently impacted by Site-related groundwater contamination or considered threatened by the Site-related groundwater contamination. The PWSA was designed to be protective of human health. The RI groundwater sampling data, the historical private well sampling data and the simulations from the groundwater flow model were used to determine the boundaries. The proposed PWSA is comprised of 174 lots in the Towns of Marbletown and Rosendale. Of these 174 lots, approximately 143 of them are currently developed for residential or commercial use and contain private wells.

Alternative AWS 2 includes continued maintenance of the 70 currently operational POU GAC systems for private well owners. This alternative includes the implementation of institutional controls, such as groundwater use restrictions, which are intended to prevent development of the bedrock aquifer in the area of currently existing or potential future contamination as a potable water supply without appropriate treatment.

AWS 3 <u>Public Water Supply Using Catskill Aqueduct</u>

Present Worth:	$ 8,573,000
Capital Cost:	$ 7,589,000
Annual O&M:	$ 64,000
Time to Implement:	2 years

Alternative AWS 3 includes the use of the Catskill Aqueduct as a new water supply source (see Figure 8) and the establishment of a water distribution system in the PWSA. The PWSA for AWS 3 is the same as described in AWS 2 (see Figure 6.) Pursuant to the Surface Water Treatment Rule (40 CFR Parts 141 and 142), raw water from the aqueduct would require treatment to remove conventional contaminants, such as particulates, color, taste, odor, and microbes. A conventional treatment scheme for a surface water supply, such as the aqueduct water, includes coagulation, flocculation, sedimentation, and filtration. After filtration, a final disinfectant (e.g., chlorine) would be added to lower the microbe content in the distribution system and control algal growth (see Figure 7.) A similar treatment scheme is currently used by the Village of New Paltz to treat its water supply, a portion of which is also drawn from the Catskill Aqueduct.

Utilization of the Catskill Aqueduct would require the establishment of a community water district in the towns of Marbletown and Rosendale and a use agreement with the New York City Department of Environmental Protection (NYCDEP). A connection to the aqueduct dewatering chamber on Canal Road would need to be made and a main would be installed to transfer raw water from the dewatering chamber to the treatment plant. To develop conceptual design cost estimates, it was assumed that the treatment plant would be located on the MRIP property. The location of the plant would be finalized during the design of the system. A pump would be needed to transfer the treated water to a water storage tank. A distribution system (see Figure 9) must also be constructed to convey the treated water from the storage tank to the users in the community. Access would need to be obtained to install the distribution system. The system would be designed to provide fire protection to comply with local requirements.

For periods of time when the Catskill Aqueduct is temporarily out of service, a backup supply of water would be needed for a minimum five-day period. The sources of the backup supply to be considered during remedial design are either the Rondout Creek or a bedrock supply well(s). The raw water from both of the possible backup water supplies would require treatment. Using the Rondout Creek would involve a pumping station at the pool created by the dam in High Falls and a raw water transmission main from the Rondout Creek to the treatment plant. As a possible backup supply well, monitoring well MRMW-13B, located near the dewatering chamber, was found to have a high yield (approximately 100 to 150 gpm) and was not in the contaminated plume area. The selection of the actual backup supply would be determined during predesign activities. The costs provided for this alternative reflect the bedrock well as a backup supply.

AWS 4 <u>Public Water Supply Using Well Field</u>

Present Worth:	$ 8,973,000
Capital Cost:	$ 7,620,000
Total Annual O&M:	$ 88,000
Time to Implement:	2 years

Alternative AWS 4 includes the installation of a new well field to service the PWSA on a full-time basis. To develop conceptual design cost estimates, the proposed location for this new well field is as shown in Figure 10. The actual location would be determined during predesign and require the drilling of test wells, additional pump tests and groundwater modeling. In this alternative, it was assumed that two supply wells would be pumping simultaneously at approximately 20 to 25 gpm each to sustain the average water demand of 45 gpm in the PWSA. A third well would be drilled as a backup.

As with AWS 3, a community water district would need to be established. Raw water from these wells would be pumped to a storage tank. It is assumed that treatment of the raw water would include chlorination at the very least and probably inorganic removal via coagulation, flocculation, settling, and filtration (needed because of the high iron and manganese content of the groundwater); this is consistent with water supply well practices in Ulster County and with the New York State regulations. Dosing equipment would maintain the necessary chlorine level to maintain disinfection (see Figure 11.) From the storage tank, water would be transferred to a distribution system, which would supply the PWSA. Access would need to be obtained to install and operate the distribution system. The system would be designed to provide fire protection to comply with local requirements.

The PWSA for AWS 4 is the same as described in AWS 2 and AWS 3.

Contaminated Bedrock Aquifer Response Alternatives

Alternatives were also developed to respond to the groundwater contaminant plume emanating from the MRIP property. As noted above, EPA is implementing a NTCRA to minimize the migration of the most contaminated groundwater in the nearfield plume. The FS has evaluated alternatives to address all of the Site-related contaminated groundwater in the bedrock aquifer.

Three alternatives were established for the groundwater response (GR).

GR 1 No Further Action

Present Worth:	$ 654,000
Capital Cost:	$ 131,000
Total Annual O&M:	$ 34,000
Time to Implement:	3 months

Alternative GR 1 is a no further action option that includes a long-term monitoring and evaluation program, presumed to be 30 years. For cost estimating purposes, it was assumed that the NTCRA extraction and treatment system on the MRIP property would operate for one year. O&M for the treatment system would be funded by the removal program.

Alternative GR 1 also includes the installation of new groundwater monitoring wells and the required sampling of potable and monitoring wells as part of a long-term groundwater monitoring program. See Figure 12. The Rondout Creek and Coxing Kill would also be sampled as part of the long-term monitoring program. This program would monitor and evaluate the fate and transport of the contaminant plume on an annual basis to determine whether the groundwater RAOs are satisfied.

The groundwater monitoring program may be discontinued when contaminant levels in the plume are below remedial action objectives for two consecutive years. This alternative assumes that the groundwater monitoring program would be the same regardless of the water supply alternative that is selected. The O&M cost for this alternative includes the monitoring program. Capital costs for this alternative covers well installation.

GR 2 Continuation of Non-Time Critical Removal Action

Present Worth:	$3,482,000
Capital Cost:	$ 131,000
Total Annual O&M:	$ 218,000
Time to Implement:	3 months

Alternative GR 2 includes active treatment of the nearfield plume which includes continuation of the NTCRA extraction and treatment system as a remedial action for a presumed period of 30 years, and institutional controls to minimize human contact with contaminated groundwater. The institutional controls would consist of groundwater use restrictions for private well users downgradient of the existing plume. Groundwater use restrictions would be proposed to prevent development of the Shawangunk fractured bedrock aquifer system (Shawangunk Formation) as a potable water source on and downgradient of the MRIP property. The groundwater use restrictions would apply in and near the areas of the existing groundwater plume. A long-term groundwater and surface water monitoring program would be included in this alternative, similar to the one described under Alternative GR 1, to monitor the movement of contaminants and to assess the efficiency of the NTCRA recovery wells in removing the contaminants from the plume. The O&M cost for this alternative includes the the monitoring program and operation of the treatment plant on the MRIP property.

GR 3 Extraction and Ex-Situ Treatment

Present Worth:	$ 6,043,000
Capital Cost:	$ 1,247,000
Total Annual O&M:	$ 312,000
Time to Implement:	2 years

Alternative GR 3 involves active remediation of contaminated groundwater by extraction and treatment Site-wide (i.e., continued operation of the NTCRA system as detailed in Alternative GR 2 to address the nearfield plume, and installation of a separate extraction and treatment system off the MRIP property to address the farfield plume.) The alternative also has a long-term monitoring component. Active remediation would reduce the time frame for restoration of the bedrock groundwater. The system's design would be similar to the extraction and treatment system of the proposed NTCRA.

Selection of a particular pumping pattern (i.e., placement of wells in and around the contaminant plume) depends on the identified depth and extent of contamination. The extraction wells would be designed to operate at an optimal rate to collect contaminated groundwater, contain the contaminant plume, and prevent the plume from migrating further downgradient. Because groundwater extraction at high pumping rates may cause depressed levels of groundwater in the bedrock aquifer and many of the existing private wells, this alternative must be paired with an AWS alternative that does not rely on local groundwater as a water supply (i.e., a groundwater supply that is not under the influence of the proposed extraction system, such as in Alternatives AWS 3 or AWS 4).

The groundwater model was used to simulate this groundwater extraction and treatment option. The number of wells, pumping rates, and well locations were varied to determine which combination would effectively capture highly contaminated groundwater in the interior of the plume (within the 100 ppb contour as of the June 1998 sampling) while letting lower contamination levels on the periphery escape and remediate through natural processes. After running several different cases with pumping rates between 25 and 50 gpm, it was determined that using three wells pumping at a rate of 40 gpm each produced drawdown averaging less than 10 ft in residential wells outside of the PWSA and effectively captured the contaminants released in the interior of the plume. If this alternative is selected, optimal pumping rates and well placement would be confirmed during the remedial design phase.

Steady-state simulations of the time necessary to achieve remedial action objectives in the aquifer were also conducted. For the case with three extraction wells each pumping at 40 gpm, along with the NTCRA extraction wells pumping at a total of 40 gpm, 29 years were required for both systems to extract contaminants, achieve RAOs and attain ARARs.

Contaminated groundwater would be pumped from the extraction wells to a water treatment plant to remove VOCs. At a minimum, groundwater would be treated for VOC removal to achieve the New York State surface water discharge requirements. Pretreatment of the groundwater would be necessary to remove conventional contaminants, such as iron and manganese, that foul treatment plant equipment. For cost estimating purposes, it was assumed that treated groundwater would be discharged to the Rondout Creek via a gravity discharge line.

Long-term groundwater monitoring would be conducted during the active remediation phase to assess the effectiveness of the groundwater extraction and treatment technology on contaminant concentrations. No new monitoring wells are proposed under this alternative, but could be installed if determined to be necessary. Periodic evaluations of the groundwater monitoring data would be used to evaluate the continued operation of the pump and treat system. The monitoring program may be discontinued when contaminant levels are below remedial action objectives for two consecutive years.

Contaminated Subsurface Soils on the MRIP Property Source Control Alternatives

Contaminated soils on the MRIP property are limited to the subsurface, i.e., greater than 2 ft below grade. The COCs in these soils are 1,2-DCE, 1,1,1-TCA and PCE, but elevated levels of TCE, DCE, DCA, ethylbenzene, and xylenes are also present. Areas of the MRIP property containing contaminated soils include those labeled on Figure 3 as Areas 1A, 1B and 2B. Additional sampling for COCs would be conducted in Areas D-1 and D-2 to determine if additional soils need to be excavated. The potential disposal pit area recently identified by EPA's removal program was found to contain elevated levels of paint-related compounds including toluene, ethylbenzene, xylenes, isopropylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, lead and naphthalene. The sampling is detailed in an EPA Trip Report titled Exploratory Trenching at the Mohonk Road Industrial Site, dated June 28, 1999. The EPA is evaluating whether this area is eligible to be addressed as a removal action; if not, this area would be addressed as part of the proposed remedy described in this PRAP.

Three alternatives have been established for source control (SC Alternatives). Alternative SC 1 involves no action. Alternative SC 2 involves excavation and ex-situ treatment of the contaminated soil that can be performed on the MRIP property. Alternative SC 3 includes excavation and off-Site treatment and disposal of the contaminated soil.

SC 1 <u>No Further Action</u>

Present Worth:	$25,000
Capital Cost:	$25,000
Total Annual O&M:	$ 0
Time to Implement:	0 year

Alternative SC 1 does not include any excavation or treatment of contaminated soils on the MRIP property, but includes fencing to restrict access to the contaminated soils.

SC 2 <u>Excavation and Ex-Situ Treatment Performed on the MRIP Property</u>

Present Worth:	$ 294,000
Capital Cost:	$ 177,000
Total Annual O&M:	$ 63,000
Time to Implement:	2 years

Alternative SC 2 involves the excavation and ex-situ treatment of approximately 200 cubic yards of soil containing contaminants at levels that exceed the RAOs. Contaminated soil on the MRIP property is approximated by the areas shown in Figure 3, however, additional sampling would be performed during the RD to further define the extent of contamination at the Site. The paint disposal area identified by EPA's removal program would be excavated for treatment, if the area were not addressed as a removal action. This area is approximately 300 cubic yards in volume, and would increase the capital cost of this alternative by roughly $50,000. During the excavation, sampling would be conducted to ensure that contaminated soil is removed to satisfy the RAOs. Uncontaminated soil, particularly the surface soil, would be stockpiled on the MRIP property and used to backfill the excavation, along with uncontaminated backfill material transported to the MRIP property.

An area of the MRIP property would be designated to perform the soil remediation using enhanced biodegradation and aeration. Contaminated soil would be spread on a liner in a thin layer. Soil nutrient levels would be measured and modified as necessary to promote optimal biodegradation. The soil would be aerated periodically to enhance volatilization of VOCs, and would be backfilled at the Site after the cleanup levels are achieved. For cost-estimating purposes, it is assumed that the treatment area would not be covered and that storm water runoff would not be collected. These assumptions would be reassessed in the remedial design phase. The storm water could collect low levels of VOCs and would be sampled to determine whether collection and treatment would be necessary prior to discharge.

The most suitable place to conduct the enhanced biodegradation and aeration process would be in an easily accessible area that is void of trees and structures. This area would be sloped slightly so that storm water could be easily collected, if necessary.

SC 3 Excavation and Off-Site Disposal

Present Worth:	$ 253,000
Capital Cost:	$ 253,000
Total Annual O&M:	$ 0
Time to Implement:	1 month

Alternative SC 3 involves the excavation and off-Site treatment (if necessary) and disposal of approximately 200 cubic yards of soil containing contaminants at levels that exceed the RAOs. The paint disposal area identified by EPA's removal program would be excavated for treatment (if necessary) and disposal, if the area were not addressed as a removal action. This area is approximately 300 cubic yards in volume, and would increase the capital cost of this alternative by approximately $80,000. The excavation and sampling procedure for Alternative SC 3 would be similar to that of Alternative SC 2. Contaminated soil would be stockpiled or placed in rolloff containers on the MRIP property. Liners and/or covers may be necessary for the stockpiling of contaminated soil. Uncontaminated soil would be stockpiled and used as a portion of the backfill to the excavation.

Based on the analytical results of the RI, contaminated soil that is generated from the MRIP property would likely be classified as nonhazardous industrial waste. Additional sampling of the excavated soil would be required to characterize the soil. Once characterized for disposal, the soil would be transported off-Site to a waste treatment or disposal facility. All treatment (if necessary) and disposal would occur at a permitted facility. For costing purposes, it is assumed that the soils could be directly landfilled without treatment. Alternative methods of treatment/disposal would be reviewed in the remedial design and the most economical option selected.

7.2 Evaluation of Remedial Alternatives

The eight criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste disposal sites in New York State (6 NYCRR Part 375) and CERCLA. A brief description of the criteria is provided below, followed by evaluations of each set of alternatives against each criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study. CERCLA has an additional criteria for State acceptance, which does not apply to this PRAP as it is being issued by NYSDEC.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs) Compliance with SCGs (which includes ARARs) addresses whether or not a remedy will meet environmental laws, regulations, standards and guidance. In general, the remedies selected must comply with 6 NYCRR Part 375, CERCLA and the NCP.

2. Protection of Human Health and the Environment This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation.

5. Reduction of Toxicity, Mobility or Volume Through Treatment Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the Site through treatment.

6. Implementability The technical and administrative feasibility of implementing each alternative is evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

7. Cost Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is termed a modifying criterion and is considered after evaluating those above and after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan are evaluated.

7.2.1 Evaluation of Potable Water Supply Alternatives

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs) The most significant SCGs for potable groundwater are the Safe Drinking Water Act

(42 U.S.C. §§ 300F et. seq.), National Primary Drinking Water Standards (40 CFR Part 141), and 6NYCRR Part 703 Groundwater Standards. For 1,1,1-TCA the Class GA groundwater (fresh groundwaters whose best usage is a source of potable water) and drinking water standard is 5 parts per billion (ppb).

The no further action alternative for the potable water (AWS 1) would not achieve compliance with SCGs for drinking water. Potable water Alternatives AWS 2, AWS 3 and AWS 4 are similarly effective in their ability to achieve applicable drinking water standards through either GAC treatment at individual wells or the installation of a public water supply. However, selection of Alternative AWS 2 would prevent active remediation of the farfield plume (Alternative GR 3) because, in the absence of a public water supply system, groundwater extraction may depress the water table and have an adverse impact on nearby private wells. Therefore, selection of this alternative would hinder attempts to actively restore the aquifer to predisposal conditions and achieve SCGs.

Construction of either the potable water supply Alternatives AWS 3 or AWS 4 will comply with the National Historic Preservation Act (NHPA) (16 U.S.C. 470), Executive Order 11988 - Flood Plain Management, Executive Order 11990 - Protection of Wetlands and 40 CFR 6 Apx. A (Policy on Implementing Executive Order 11990), EPA's 1985 Statement of Policy on Floodplains/ Wetlands Assessments for CERCLA Actions, New York State wetlands protection under 6 NYCRR Part 662, and 6 NYCRR Part 601 for the developing a water distribution system. The pipeline installation as depicted conceptually in Figure 9 for Alternatives AWS 3 and AWS 4 would also comply with location-specific SCGs. Alternative AWS 3 would comply with NYCDEP requirements.

2. <u>Protection of Human Health and the Environment</u>

The no further action alternative, AWS 1, for the potable water would not be protective of human health in the currently impacted and threatened areas. Alternative AWS 2 would be more protective of human health than Alternative AWS 1, but the potential for human exposure remains if the GAC filters fail. The NYSDOH does not consider the use of point-of-use GAC filtration units a long-term remedy, if a cost-effective, safe and reliable alternate water supply is available. It is generally the policy of both the NYSDEC and the EPA not to fund the long-term operation, maintenance and monitoring (O,M&M) of a large number of GAC filters as a long-term remedy, such as AWS 2. Alternative AWS 3 (Catskill Aqueduct as primary supply) and Alternative AWS 4 (Well Field as primary supply) are the most protective alternate water supply alternatives. AWS 3 and AWS 4 would be protective of human health through the supply of reliable, uncontaminated potable water.

3. <u>Short-term Effectiveness</u>

Alternative AWS 1, no action, would not be effective in the short term for providing clean potable water. All of the remaining potable water supply alternatives would be effective for providing potable water in the short term to the consumers whose wells have GAC filtration systems currently installed. GAC treatment has proven to be effective to date. Periodic monitoring of private wells that could potentially be impacted by the contaminant plume (i.e., wells downgradient of the contaminant plume) has been instituted by the local health department and has proven to be effective to date. NYSDEC continues to periodically sample monitoring wells in the community. Alternatives AWS 3 and AWS 4 would be effective in the short term as they incorporate the provision for installation and maintenance of GAC filters to impacted wells until a public water supply is provided. Implementation of these alternatives would take an estimated 2 years and cause noise and traffic impacts. However, these impacts can be minimized by employing appropriate construction techniques and practices.

4. Long-term Effectiveness and Permanence

Alternative AWS 1 does not provide long-term effectiveness or permanence. Alternative AWS 2 could be effective in providing a long-term source of potable water, but the potential for contaminant breakthrough exists in GAC systems, thus GAC systems are not considered by EPA and NYSDEC to be a permanent remedy. In addition, maintaining a large number of individual POU GAC systems is less reliable, and would require more maintenance than an area-wide water treatment system, which would be used with Alternatives AWS 3 and AWS 4. Therefore, Alternatives AWS 3 and AWS 4 would be more effective than Alternatives AWS 1 or AWS 2 in providing a long-term, reliable source of potable water.

The water supply from Alternative AWS 4 is slightly less reliable than Alternative AWS 3 since the wells could run dry during drought conditions. Based on groundwater model simulations, Alternative AWS 4 water supply wells pumping in the proposed upgradient location would not draw contaminants upgradient, to any previously unaffected residential areas or into the supply wells. Also based on model results, the impact of pumping the supply wells at 22.5 gpm each and NTCRA extraction wells at a total of 40 gpm on residential wells outside of the PWSA would be minimal except for two residential wells located relatively close to both the supply wells which the model predicted would exhibit a drawdown of about 16 ft. For Alternative AWS 4, it is important to note that without a detailed survey of well depths (and the depth of pumps in these wells), drawdowns such as those simulated, coupled with seasonal water level variations, may adversely affect some residential wells.

Alternative AWS 3 would provide permanence and the best long-term effectiveness.

5. Reduction of Toxicity, Mobility or Volume Through Treatment

Alternative AWS 1 would not reduce the toxicity, mobility or volume of contaminants in the groundwater. Alternative AWS 2 would reduce toxicity by treating contaminated groundwater at the point-of-use with GAC filtration. Alternatives AWS 3 and AWS 4 would eliminate the toxicity to residents by providing clean potable water to the currently impacted area and the threatened area.

6. Implementability

The no action alternative, AWS 1, is easily implemented. The installation of an additional 75 filtration systems can be readily implemented under Alternative AWS 2 as 70 existing GAC filtration systems have been installed and maintained successfully. However, maintaining this large a number of individual systems would require significant oversight.

Alternatives AWS 3 and AWS 4 are both technically feasible. These alternatives would require the construction of a water treatment plant, storage tower and a water distribution system, state and local approval of the design of the facilities and the formation of a water district. Construction efforts would need to be coordinated with the local utility companies. In addition, a water usage agreement would need to be reached between the PWSA water district and the NYCDEP for Alternative AWS 3.

7. Cost
Alternative AWS 1, no further action, has no capital or operation, maintenance and monitoring (O,M&M) costs. The capital costs for Alternative AWS 2 includes the costs for GAC filtration units which would be added to approximately 75 additional properties whose wells are considered threatened by the groundwater plume. The costs for AWS 2 for the continued operation, maintenance and monitoring (O,M&M) of the 70 GAC filtration systems currently installed and the 75 additional systems which would be installed are based on an estimated future yearly cost of $2,215 per system. The capital costs for Alternatives AWS 3 and AWS 4 are essentially the same and are considerably higher than Alternative AWS 2. The O,M&M of Alternative AWS 4 is somewhat higher than Alternative AWS 3 due to greater electrical usage.

8. Community Acceptance
A "Responsiveness Summary" will be prepared and attached to the Record of Decision for the Site that describes public comments received during the public comment period and how the comments and concerns will be addressed. If the final remedy selected differs significantly from the proposed remedy, the Record of Decision will describe the differences and reasons for the changes.

7.2.2 Evaluation of Contaminated Bedrock Aquifer Response Alternatives

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs)
Effluent from the active groundwater response Alternatives GR 2 and GR 3 would comply with the Clean Water Act (CWA, 33 U.S.C. §§ 1251-1387) and Safe Drinking Water Act (42 U.S.C. §§ 300F et. seq.), and NYS Surface Water Standards. Air emissions would comply with the Clean Air Act (CAA, 42 U.S.C. §§ 7401 et. seq.), 6 NYCRR Part 2129 (air emissions) and NYS Air Guide - 1. The alternatives would also comply with the National Historic Preservation Act (NHPA), Executive Order 11988 - Flood Plain Management, Executive Order 11990 - Protection of Wetlands and 40 CFR 6 Apx. A (Policy on Implementing Executive Order 11990), EPA's 1985 Statement of Policy on Floodplains/Wetlands Assessments for CERCLA Actions, and New York State wetlands protection under 6 NYCRR Part 662.

The no further action alternative for groundwater, GR 1, would not achieve compliance with State or Federal drinking water standards in either the currently impacted area or the threatened area.

Groundwater Response Alternative GR 2 would achieve applicable groundwater standards in the nearfield portion of the plume through active groundwater extraction and treatment while the farfield plume cleanup would rely on natural processes to eventually achieve applicable groundwater standards. Alternative GR 3 would be more effective than Alternative GR 2 in that it would achieve applicable groundwater standards throughout the entire nearfield and farfield plume through active treatment and in a shorter time frame.

2. Protection of Human Health and the Environment
Of the three groundwater response alternatives, Alternative GR 3, which would extract and treat the contaminated groundwater Site-wide, is the most protective by preventing human contact with the nearfield and farfield plumes. Alternative GR 1 would not include any measures to prevent human contact with

contaminated groundwater. Alternative GR 2 would extract and treat the nearfield portion of the groundwater and would rely on only institutional controls to prevent human contact with contaminated groundwater in the farfield portion of the plume.

3. **Short-term Effectiveness**

Groundwater Response Alternatives GR 1 and GR 2 would have minimal short-term impacts on human health and the environment as they would not require any significant construction. Alternative GR 3 would result in adverse impacts to local roads and traffic, as well as impacts to the community from noise and dust generation due to the installation of piping and the construction of a groundwater treatment facility. However, these impacts would be minimized by employing appropriate construction techniques and practices.

4. **Long-term Effectiveness and Permanence**

Groundwater response Alternative GR 1 would not be an effective or permanent remedial alternative in the long term. Also, after one year, the NTCRA extraction and treatment system would be shut down and would no longer be acting to minimize the migration of the nearfield plume. Alternative GR 2 would be more effective in reducing impacts to downgradient wells, however, contaminants in the farfield plume would not be addressed. Alternative GR 3 would be the most effective alternative to control and remediate the groundwater contaminant plume and reduce impacts to downgradient wells. The groundwater model results show that implementation of Alternative GR 3 will contain all contaminants within the potential PWSA and that any wells outside the PWSA would not be impacted.

5. **Reduction of Toxicity, Mobility or Volume Through Treatment**

Groundwater Response Alternative GR 1 would not actively result in any reduction of toxicity, mobility, or volume of contamination present in the groundwater. Both Alternatives GR 2 and GR 3 would reduce these parameters in the nearfield plume, but GR 2 would not actively reduce these parameters in the farfield plume. Alternative GR 3 would actively reduce these parameters throughout the entire groundwater contaminant plume.

6. **Implementability**

Groundwater response Alternatives GR 1 and GR 2 would be easily implemented. Institutional controls for GR 2 would be established by the EPA and the NYSDEC. The NTCRA component of Alternative GR 2 would already be in place on the MRIP property, and would continue operating and require a part-time operator. For Alternative GR 3, the technologies for the installation of the extraction wells and treatment facility off the MRIP property are readily available, although they would take about two years to construct. Because groundwater extraction at high pumping rates may cause depressed levels of groundwater in the bedrock aquifer and many of the existing private wells, this alternative must be paired with an AWS alternative that does not rely on local groundwater as a water supply (i.e., a groundwater supply that is not under the influence of the proposed extraction system such as in Alternatives AWS 3 or AWS 4). Access to private property for this construction would need to be obtained. Public perceptions concerning the placement of the facilities would also need to be addressed.

7. **Cost**

The capital costs for groundwater response Alternatives GR 1 and GR 2 are the same since both alternatives would provide the same enhanced groundwater monitoring program. The O,M&M costs for Alternative GR 2 are greater than for Alternative GR 1 due to the continued operation of the NTCRA groundwater extraction and treatment system on the MRIP property. The capital costs for Alternative GR 3 are considerably higher than for Alternatives GR 1 and GR 2, since Alternative GR3 would involve the design and construction of an additional groundwater extraction and treatment system off the MRIP property. The O,M&M costs for Alternative GR 3 are somewhat higher than Alternative GR 2 since Alternative GR 3 would involve the operation of a second treatment facility. It is presumed that both Alternatives GR 2 and GR 3 would require O,M&M for a period of 30 years.

8. Community Acceptance
A "Responsiveness Summary" will be prepared and attached to the Record of Decision for the Site that describes public comments received during the public comment period and how the comments and concerns will be addressed. If the final remedy selected differs significantly from the proposed remedy, the Record of Decision will describe the differences and reasons for the changes.

7.2.3 Evaluation of Contaminated Subsurface Soils on the MRIP Property Source Control Alternatives

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs)
The most significant SCG for the subsurface contaminated soils on the MRIP property is the NYS Recommended Soil Cleanup Objectives contained in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046. Disposal of the contaminated soils must comply with the Resource Conservation and Recovery Act (RCRA, 42 U.S.C. Section 6901 et seq.) and the NYS solid and hazardous waste regulations (6 NYCRR Parts 370-376).

The no further action alternative SC 1 for the contamination in the MRIP subsurface soils would not take any active measures to achieve the SCGs. Alternative SC 2 would achieve applicable soil cleanup objectives through excavation and on-Site treatment, and Alternative SC 3 would achieve soil cleanup objectives through excavation and shipment to an appropriate off-Site disposal facility. Although the current areas of excavation are outside floodplains, wetlands, and cultural resources, if additional areas are excavated or the existing areas are expanded, the alternatives would also need to comply with the National Historic Preservation Act (NHPA), Executive Order 11988 - Flood Plain Management, Executive Order 11990 - Protection of Wetlands and 40 CFR 6 Apx. A (Policy on Implementing Executive Order 11990), EPA's 1985 Statement of Policy on Floodplains/Wetlands Assessments for CERCLA Actions, and New York State wetland protections under 6 NYCRR Part 662.

2. Protection of Human Health and the Environment
The no further action Alternative SC 1 for the soils on the MRIP property would provide minimal protection of human health and the environment as the contaminants would remain in the environment, because access would be restricted by fencing. It is noted that surface soils (0 to 2 ft below grade) in Areas 1, 2, and D-2 do not contain COCs above cleanup goals and would act as a barrier to human contact with any contaminated soil in the subsurface. The concrete floor inside the building would

act as a barrier to the contaminated soil in Area D-1.

Alternatives SC 2 and SC 3 would be equally protective of human health and the environment. Alternative SC 2 would remove the contaminants through excavation and treatment on the MRIP property. Alternative SC 3 would remove the contaminants through excavation and disposal at an off-Site facility.

3. Short-term Effectiveness
Alternative SC 1 for contaminated soil on the MRIP property would not result in short-term health or environmental impacts. Daily activities conducted by the current Site tenants may be disrupted by the excavation and construction activities that would be required to implement Alternatives SC 2 and SC 3. However, these impacts can be minimized by employing appropriate construction techniques and practices.

4. Long-term Effectiveness and Permanence
Alternative SC 1 for contaminated soil on the MRIP property would not provide long-term effectiveness or permanence since contaminants would remain at the Site, and the contaminated soils could continue to have impacts to groundwater. Alternatives SC 2 and SC 3 would be similarly effective in satisfying this criterion. Alternative SC 2 would permanently remove contaminants from Site subsurface soils through biodegradation; Alternative SC 3 would remove the contaminated subsurface soils and dispose of them off-Site.

5. Reduction of Toxicity, Mobility or Volume Through Treatment
Alternative SC 1 for contaminated soil on the MRIP property would not reduce toxicity, mobility or volume of contamination present in the subsurface soils. Both Alternatives SC 2 and SC 3 reduce the mobility and volume of the VOCs through excavation. However, only Alternative SC 2 would reduce the toxicity of the subsurface soils through biodegradation. Based on existing RI data, it is not expected that the soils excavated under Alternative SC 3 would require treatment for disposal at an off-Site facility.

6. Implementability
Subsurface contaminated soil remedial alternatives on the MRIP property are all implementable; however, Alternative SC 2 would require a treatability study to determine the effectiveness of the enhanced biodegradation/aeration of Site soils. Alternative SC 3 would require waste acceptance by the off-Site disposal facility, although this is not expected to be a problem.

7. Cost
The capital cost for the no further action Alternative SC 1 is limited to the installation of fencing. The capital costs for Alternatives SC 2 and SC 3 are somewhat similar since both alternatives involve the excavation of the contaminated subsurface soils. Alternative SC 2 has O,M&M costs for two years since the contaminated soils would be treated on the MRIP property. Alternative SC 3 has no O,M&M costs since the contaminated soils would be disposed of off-Site.

8. Community Acceptance
A "Responsiveness Summary" will be prepared and attached to the Record of Decision for the Site that describes public comments received during the public comment period and how the comments and concerns will be addressed. If the final remedy selected differs significantly from the proposed remedy, the Record of Decision will describe the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PREFERRED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC, with the support of EPA, is proposing the following as a remedy for the Site:

Potable Water Supply

Alternative AWS 3 - The construction and operation of a new public water supply system to provide clean and safe potable water to the residences or businesses in the Towns of Marbletown and Rosendale with impacted or threatened private supply wells. The proposed primary water supply for this new water district is the Catskill Aqueduct.

Alternative AWS 3 is being proposed because it eliminates inhalation, ingestion and dermal contact with contaminated groundwater associated with the Site that does not meet the State or Federal drinking water standards. Alternative AWS 3 is the preferred alternative because it is considered to be the most reliable source of potable water over the long term. The potential for breakthrough exists with the GAC filtration systems (Alternative AWS 2). GAC filters are not considered a long-term remedy, and it is more efficient to operate a central treatment plant rather than maintain an estimated 145 individual GAC units. In addition, selection of Alternative AWS 2 would hinder Site-wide remediation because, in the absence of a public water supply system, groundwater extraction to address the farfield plume (Alternative GR 3) may depress the water table and have an adverse impact on local private wells. The use of a well field as the primary source of potable water (AWS 4) is considered less desirable, since the wells could run dry during drought conditions; would likely be high in iron content which would require iron removal and the resulting generation and disposal of sludge from this operation; and would be more susceptible to possible future contamination. Selection of Alternative AWS 3 as a preferred remedy to provide a permanent, alternative water supply is consistent with the recommendations made in the NYSDOH Health Consultation completed for the Site in December 1997.

The estimated present worth cost to implement the potable water supply portion of this remedy is $8.6 million. The cost to construct the remedy is estimated to be $7.6 million and the estimated average annual operation and maintenance cost for 30 years is $64,000.

The elements of the proposed potable water supply remedy are as follows:

- A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction and operation of a new public water supply system.

- The construction of a water treatment plant with a maximum daily design flow of approximately 126,100 gallons. The primary source of water would be the Catskill Aqueduct with a connection located at the NYCDEP dewatering chamber on Canal Road. During periods of time when the Catskill Aqueduct may be temporarily out of service, a backup supply of water from either the Rondout Creek or a backup supply well(s) would be used to provide raw water to the treatment plant. The actual backup supply would be determined during the design phase of the project.

- The construction of a water distribution system for the PWSA as depicted in Figure 9.

This system would include a 150,000-gallon storage tank, 8-inch diameter transmission main and provide fire protection.

- The continued operation of the NYSDEC Interim Remedial Measure (IRM) to monitor and maintain the individual granular activated carbon (GAC) filtration systems in use until such a time that the new public water supply system is fully operational. If additional wells are impacted in the interim, GAC filtration systems would be added.

The proposed remedy is contingent on the creation of a new public water service district by local authorities which would include 174 properties in the Towns of Marbletown and Rosendale. The boundaries of the proposed district are depicted in Figure 6.

Contaminated Bedrock Aquifer

Alternative GR 3 - The continued operation of the EPA's NTCRA (the extraction and treatment of contaminated bedrock groundwater on the MRIP property) and the design, construction and operation of an extraction and treatment system off the MRIP property to address the farfield VOC plume.

Based on an evaluation of the response alternatives with the eight evaluation criteria, Alternative GR 3 is being proposed. Alternative GR 3 is the only alternative that will attempt to actively achieve applicable SCGs in the entire contaminant plume. Alternative GR 1 relies only on natural processes to reduce the toxicity, mobility or volume of contamination present in the groundwater. Alternative GR 2 provides prevention of human contact through institutional controls and extraction and treatment of contaminated groundwater in the nearfield plume for 1 year, but relies on natural processes to address the farfield plume. Alternative GR 3 reduces the volume, mobility and toxicity of the contaminated groundwater both in the nearfield and farfield plumes in the shortest amount of time. Alternative GR 3 would be designed to prevent the migration of the VOC contaminants in the groundwater to areas outside the proposed PWSA and possibly impacting additional private water supply wells.

The estimated present worth cost to implement the groundwater restoration portion of this remedy is $6 million. The cost to construct the remedy is estimated to be $1.2 million and the estimated average annual operation and maintenance cost for 30 years is $312,000.

The elements of the proposed groundwater response remedy are as follows:

- The design and construction of a series of 3 to 6 new bedrock groundwater pumping wells to gain hydraulic control over the contaminant plume and prevent the plume from migrating further downgradient. The exact location and number of these new pumping wells would be determined by conducting pump tests and groundwater modeling during the pre-design phase of the project.

- The design and construction of a new water treatment plant to remove VOCs from the groundwater. Treated water would be discharged to the Rondout Creek in compliance with effluent limitations for this surface water body. Conceptually, the location of the treatment plant would be near the Rondout Creek and north of Route 213. The exact location of the plant would be determined during the pre-design phase of the project. The cultural resources and the aesthetics of the neighborhood would be an important factor in the final design of the treatment plant.

- The continued operation of the groundwater pumping wells and treatment system on the MRIP property, which are part of EPA's NTCRA to address the most contaminated portion of the groundwater plume.

- The implementation of a long-term groundwater monitoring program that would assess the effectiveness of groundwater pumping and treatment on the contaminant levels in the aquifer over time. The need for additional monitoring wells would be assessed during the remedial design.

- The collection and analysis of surface water samples from the Rondout Creek and the Coxing Kill as part of the long-term monitoring program to ascertain that the groundwater plume has not migrated into these water bodies.

Subsurface Contaminated Soils on the MRIP Property

Alternative SC 3 - The excavation and off-Site disposal of contaminated subsurface soils located on the MRIP property. The paint waste area identified by EPA's Removal Program would also be excavated for off-Site disposal if it is not addressed as a removal action.

Alternative SC 3 is proposed because it is cost-effective, would permanently mitigate the threat posed by Site soils, and would result in less disruption of MRIP property operations than Alternative SC 2. Unlike Alternative SC 1, which takes no active measures to achieve Site cleanup objectives, Alternative SC 3 would remove the sources of contamination in the subsurface soils on the MRIP property, reduce the volume and mobility of VOCs in the soils, and achieve applicable soil cleanup objectives through excavation.

The estimated present worth cost to implement the contaminated soils portion of this remedy is $253,000; and there are no long-term operation and maintenance costs. If the recently discovered paint waste area cannot be addressed by EPA as a removal action, the cost for this alternative would increase by approximately $80,000. With the inclusion of these costs, this alternative remains cost-effective.

The elements of the proposed remedy for subsurface contaminated soils on the MRIP property are as follows:

- The excavation and off-Site disposal and treatment (if necessary) of soil containing contaminants at levels that exceed RAOs. Contaminated soil would be stockpiled or placed in rolloff containers on the MRIP property. Once characterized for disposal, the soil would be transported off-Site to a waste treatment or disposal facility. Uncontaminated soil would be stockpiled and used as a portion of the backfill to the excavation. If not addressed by EPA as a removal action, soils and other materials in the recently identified paint waste area, estimated to be approximately 300 cubic yards, would also be excavated and transported in the same manner.

- Additional sampling during design to delineate the soils exceeding the RAOs further.

- The collection of soil samples from the side walls and bottoms of the excavations to verify that RAOs are achieved.

- Once the completion of excavation is confirmed, the excavated areas will be backfilled with clean fill and restored to pre-remediation conditions.

Total Estimated Cost

The estimated capital and present worth cost for each proposed alternative and the sum for all the proposed alternatives, which represents the total estimated cost, is provided below:

Alternative	Capital Cost	Present Worth
AWS 3	$ 7,589,000	$ 8,573,000
GR 3	$ 1,247,000	$ 6,043,000
SC 3	$ 253,000	$ 253,000
Total cost	$ 9,089,000	$ 14,869,000

Written comments on the PRAP can be submitted until January 15, 2000 to Patrick Hamblin, EPA Project Manager, at the following address:

EPA
Emergency & Remedial Response Division
290 Broadway, 20th Floor
NY, NY 10007-1866
Phone: (212) 637-3314
Fax: (212) 637-3966

List of Tables and Figures

Table 1
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	RAO (ppb)
Groundwater (1)	Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND to 87,000	51 of 85	5
		1,1-Dichloroethylene	ND to 10,000	33 of 85	5
		1,1-Dichloroethane	ND to 6,700	32 of 85	5
		Trichloroethylene	ND to 3,300	26 of 85	5
Subsurface Soils (2)	Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND to 4,600	2 of 62	800
		1,1-Dichloroethylene	ND to 250	0 of 62	400
		1,1-Dichloroethane	ND to 1,300	2 of 62	200
		1,2-Dichloroethylene	ND to 6900	2 of 62	300
		Trichloroethylene	ND to 730	1 of 62	700
		Tetrachloroethylene	ND to 25,000	4 of 62	1400
		Xylene	ND to 570,000	2 of 24	1200
		Ethyl benzene	ND to 61,000	2 of 24	5500

(1) Data from six rounds of groundwater monitoring well sampling was utilized. All monitoring wells were not sampled in every round. Monitoring wells include upgradient wells and off-site plume boundary wells. The dates of the sampling events were November 1996, May 1997, September 1997, December 1997, May 1998 & October 1998.

(2) Data from the October 1996 soil probe samples (RI Report Figure 3-1), the July 1997 test pit samples (RI Report Table 6-10), the October 1997 hand auger samples (RI Report Table 6-11) and the April-May 1998 supplemental RI subsurface soil sampling (RI Report Table 6-15) were utilized. See RI Report Tables 7-5 through 7-8 for additional presentations of these data. Background subsurface soil samples are included.

RAO - Remedial Action Objective
ppb - parts per billion.

Table 2
Remedial Alternative Costs*

Remedial Alternative	Capital Cost	Annual O,M&M	Total Present Worth
Potable Water Supply Alternatives			
AWS 1 - No Further Action	$0	$0	$0
AWS 2 - Installation & Maintenance of Additional GAC Filter Systems	$384,000	$321,000	$5,319,000
AWS 3 - Public Water Supply Using Catskill Aqueduct	$7,589,000	$64,000	$8,573,000
AWS 4 - Public Water Supply Using Well Field	$7,620,000	$88,000	$8,973,000
Contaminated Bedrock Aquifer Response Alternatives			
GR 1 - No Further Action	$131,000	$34,000	$654,000
GR 2 - Minimal Action	$131,000	$218,000	$3,482,000
GR 3 - Extraction and Ex Situ Treatment	$1,247,000	$312,000	$6,043,000
Contaminated Subsurface Soil on the MRIP Property Source Control Alternatives			
SC 1 - No Further Action	$25,000	$0	$25,000
SC 2 - Excavation and Ex Situ Treatment Performed on the MRIP Property	$177,000	$63,000	$294,000
SC 3 - Excavation and Off Site Disposal	$253,000	$0	$253,000

* The capital costs have been estimated for each alternative. Operations, monitoring and maintenance (O,M&M) costs for each alternative are included based on a 30-year time frame. Actual operational time frames (time required for long-term groundwater monitoring or pumping and treatment of groundwater) may be shorter or longer than 30 years depending on the time for achievement of site remedial action objectives. These cost estimates are for comparative purposes; detailed cost estimates will be prepared in the remedial design phase.

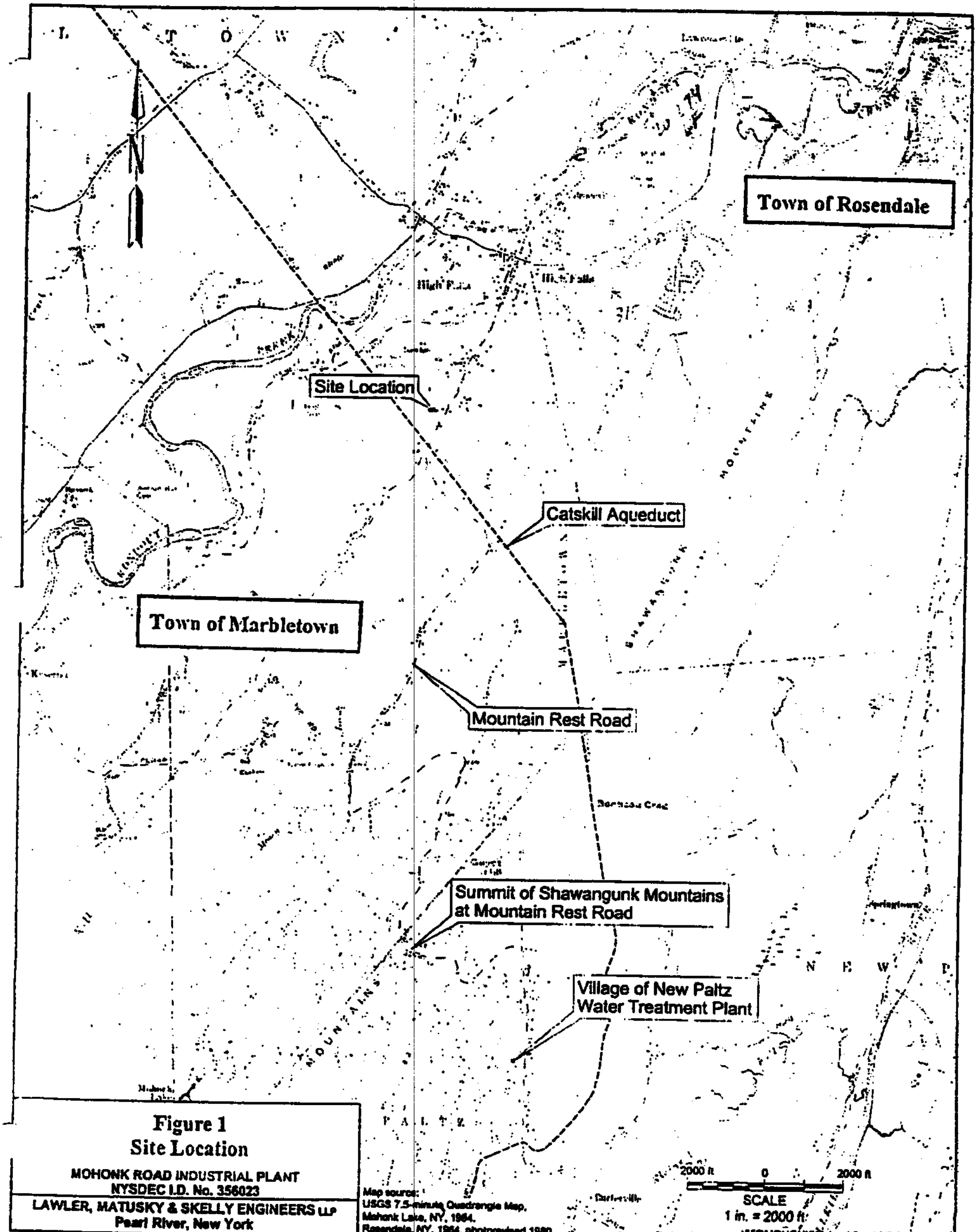
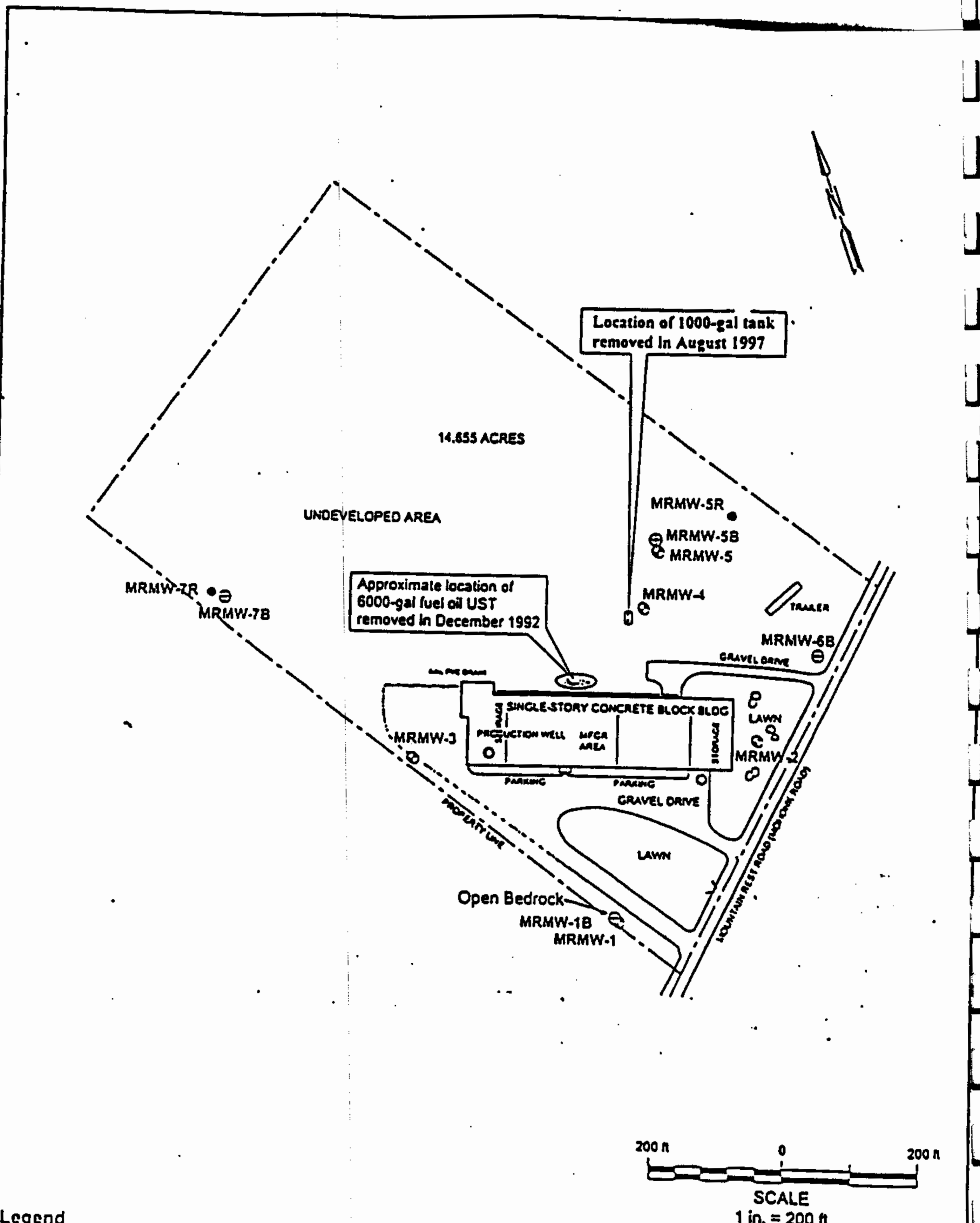


Figure 1
Site Location

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

Map source:
USGS 7.5-minute Quadrangle Map,
Mohonk Lake, NY, 1964.
Rosendale, NY, 1964, photorevised 1980.



Legend

- Bedrock wells
- Interface wells
- Existing production wells
- Recovery wells

Map source: Richard T. Sherman, P.C., 1981.

Figure 2

Site Plan

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP

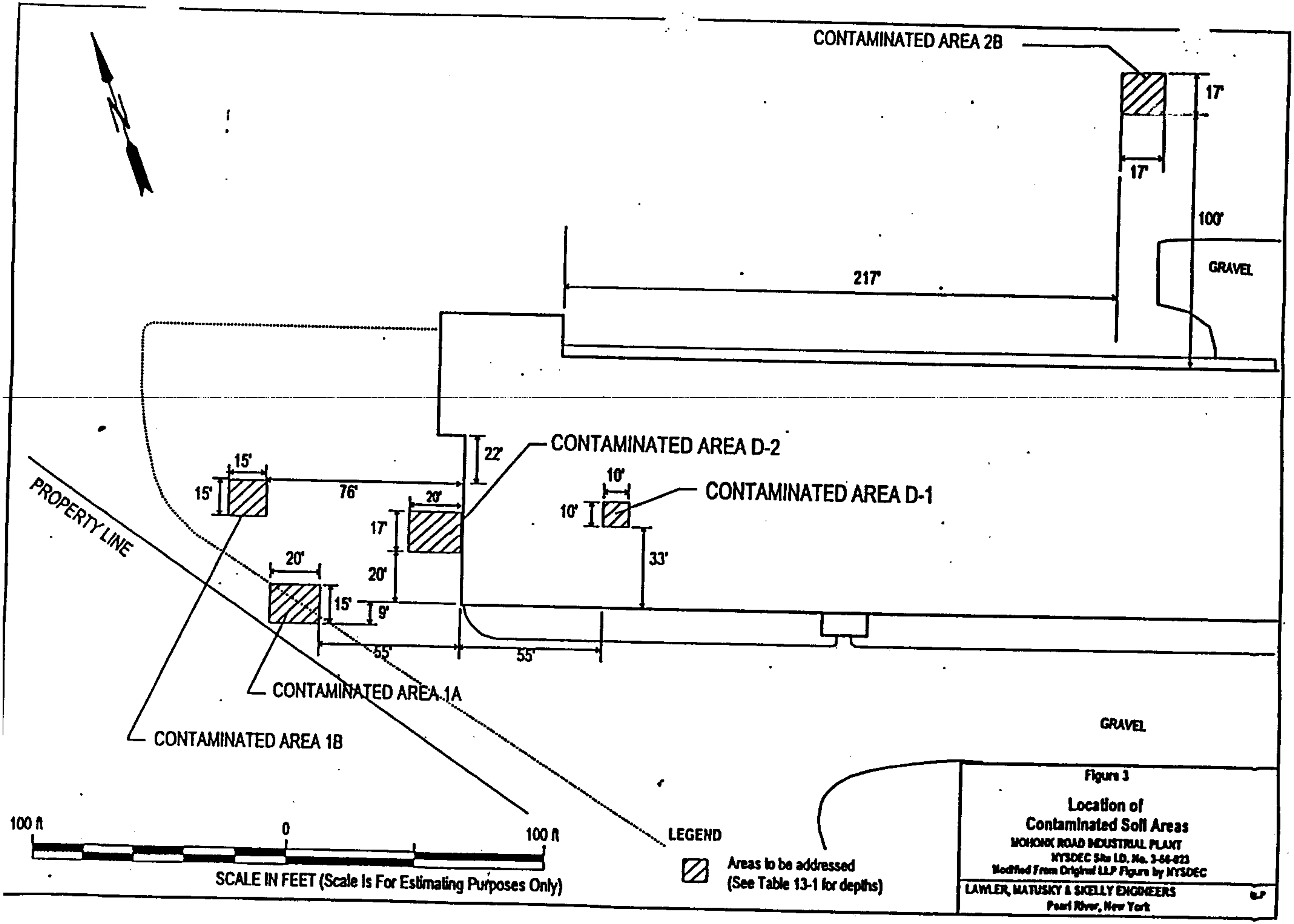
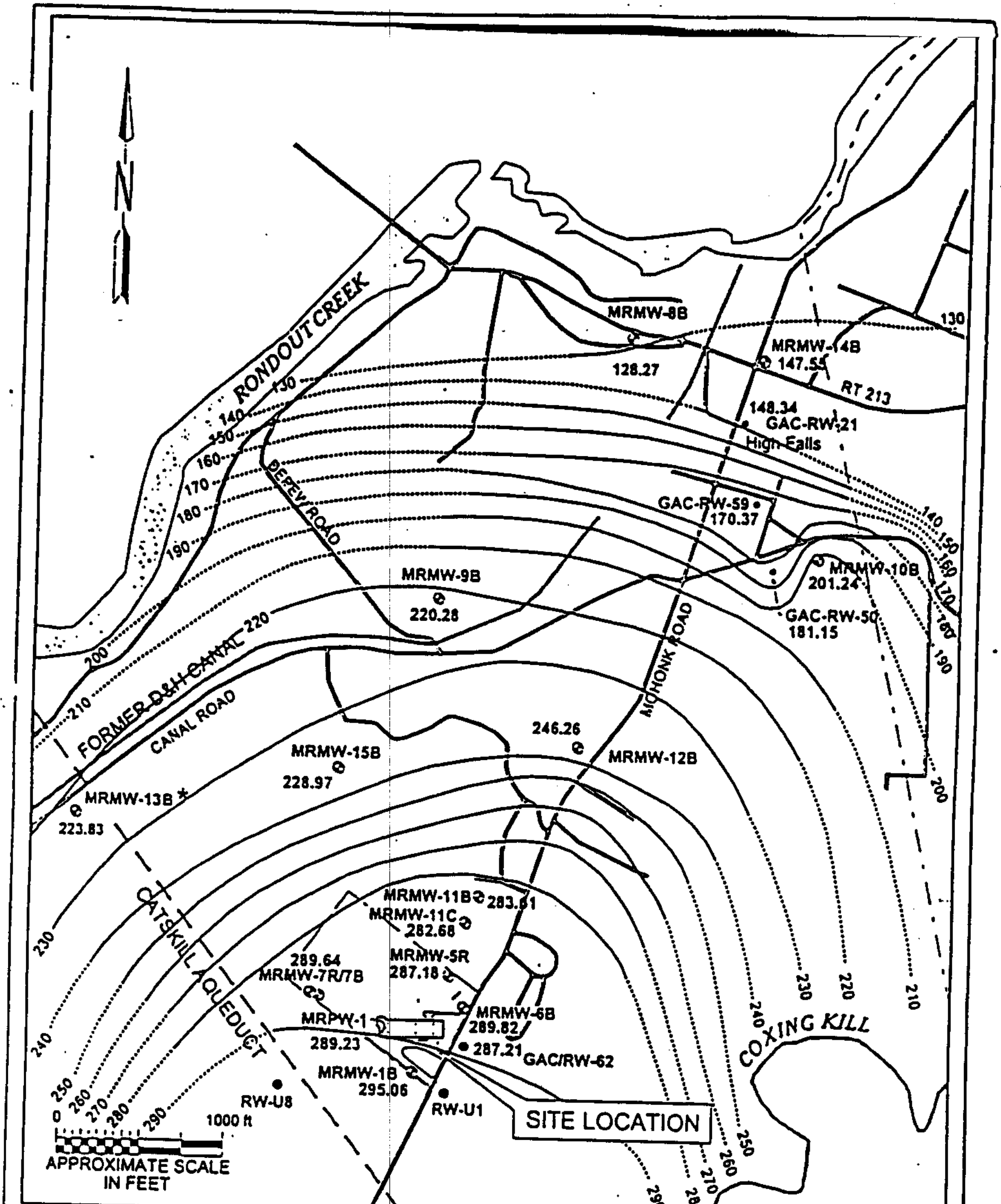


Figure 3

Location of Contaminated Soil Areas

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC Site I.D. No. 3-56-023
Modified From Original LLP Figure by NYSDEC

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



LEGEND

MRMW-1 Monitoring well (number indicates groundwater elevation relative to MSL)

Residential well

Production well

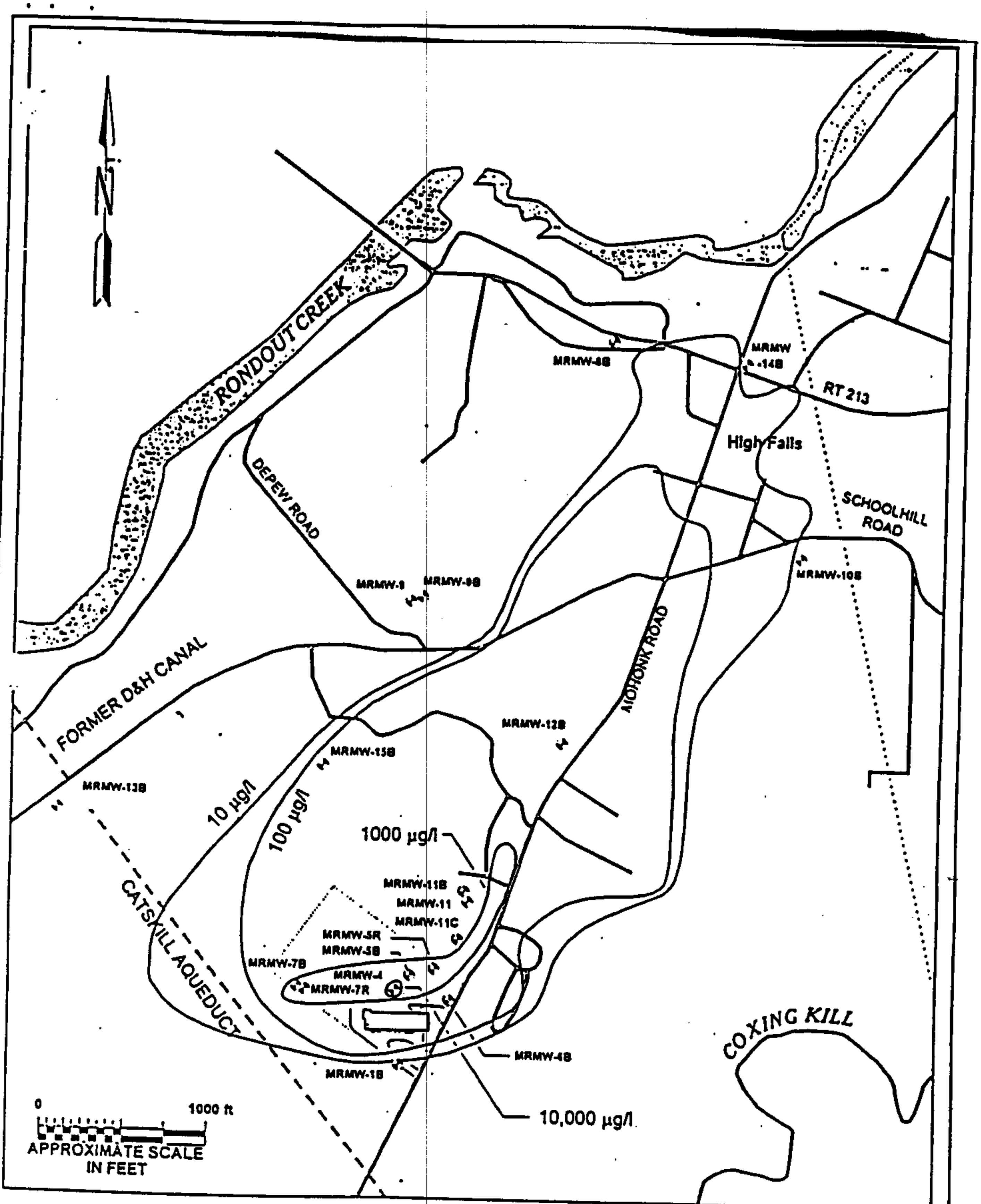
Groundwater elevation contours (MSL) (dashed where inferred)

* Indicates artesian well

Lawler, Matusky & Skelly Engineers LLP
One Blue Hill Plaza • Pearl River, New York 10965
ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS

Bedrock Groundwater Contour
May 1998
Mohonk Road Industrial Plant
NYSDEC I.D. No. 356023

Figure 4



Concentrations are for Total Volatile Organic Compounds (VOCs) in the Bedrock Aquifer
$\mu g/l$ = parts per billion (ppb)

LMS Lawler, Matusky & Skelly Engineers LLP One Blue Hill Plaza • Pearl River, New York 10965 ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS	Approximate Groundwater Plume Based on May and June 1998 Groundwater Sampling Results Mohonk Road Industrial Plant NYSDEC I.D. No. 356023	Figure 5

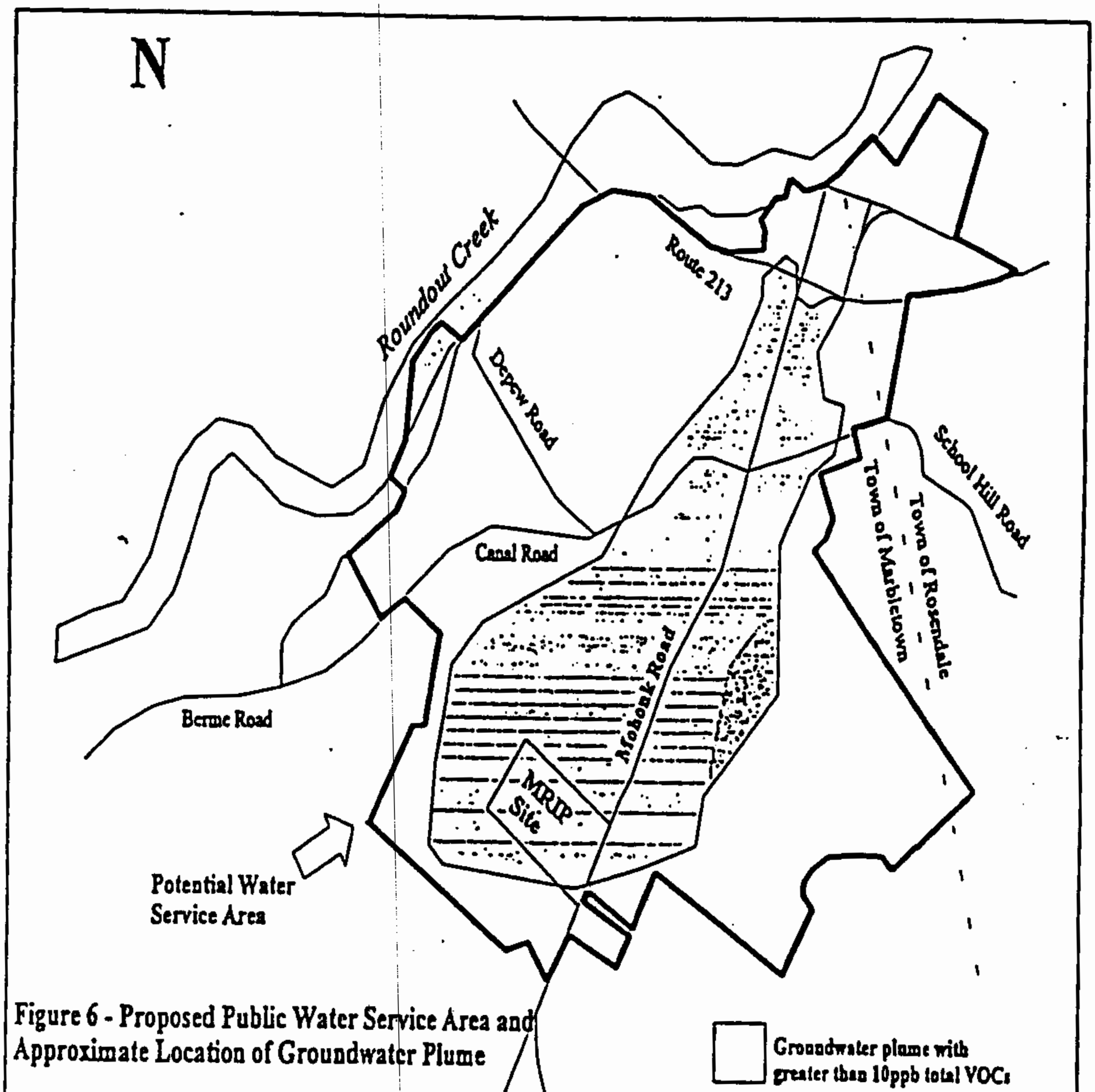


Figure 6 - Proposed Public Water Service Area and Approximate Location of Groundwater Plume

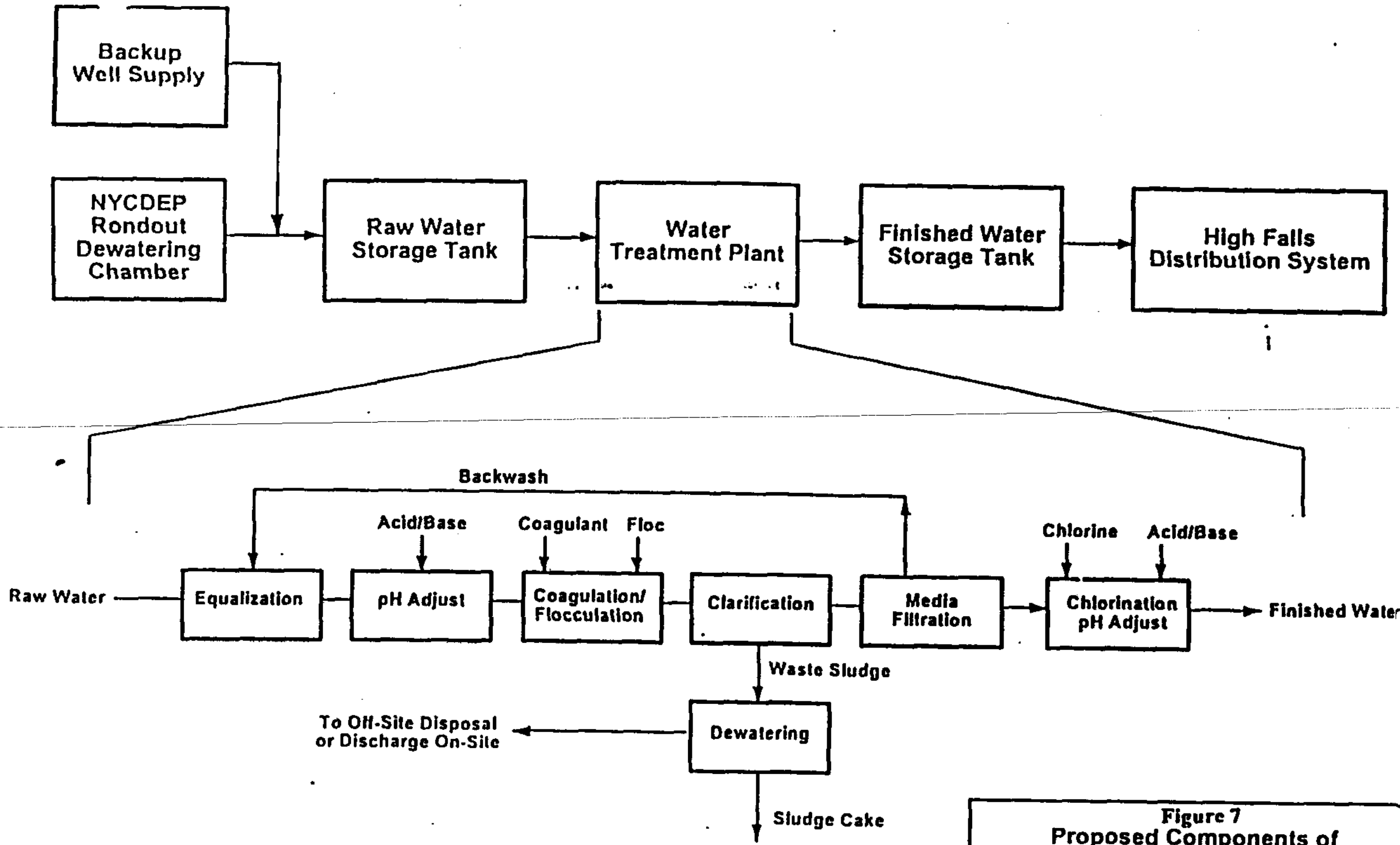


Figure 7
Proposed Components of Alternative AWS 3: Water Supply Using Catskill Aqueduct (Including Backup Supply)

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

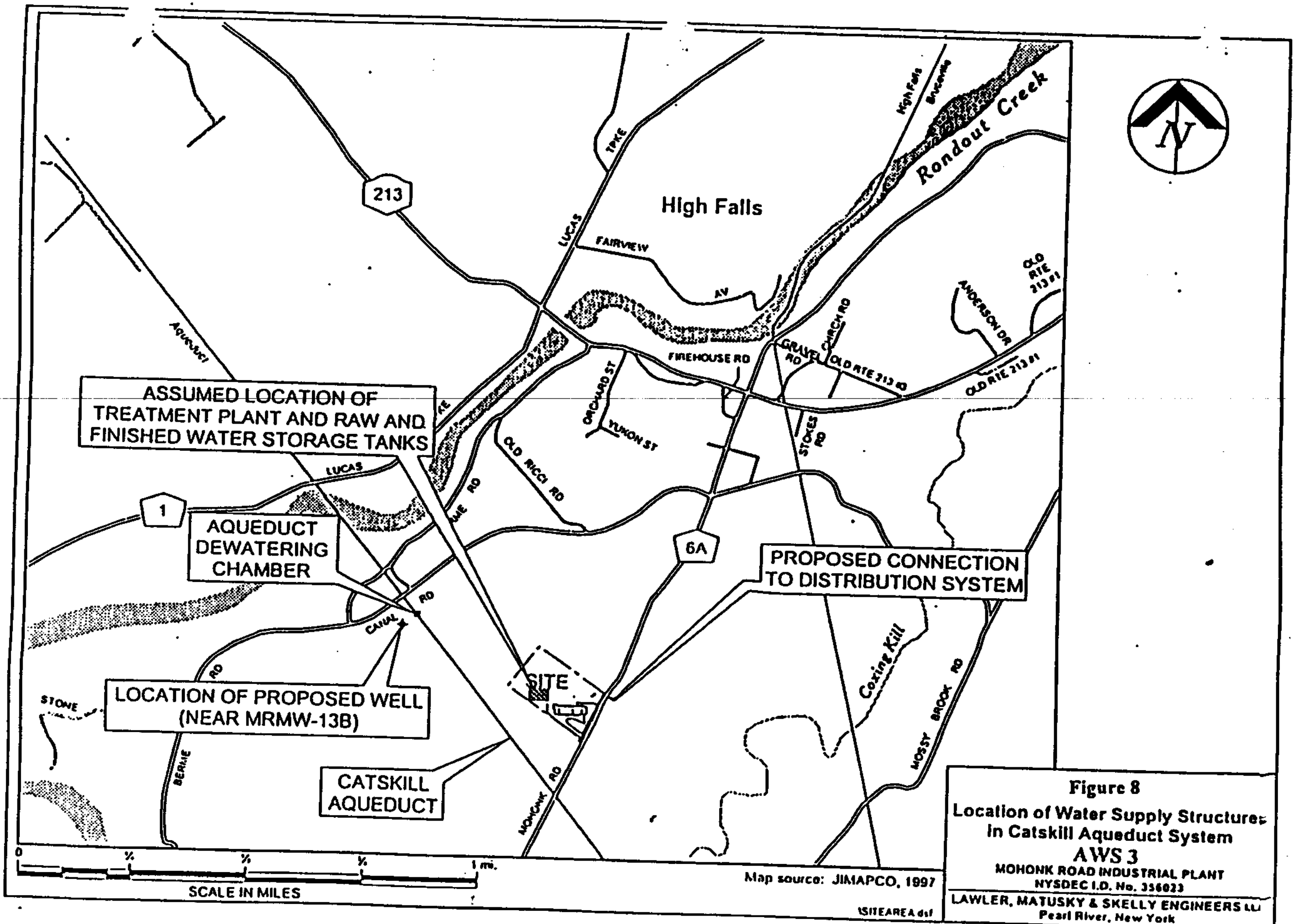


Figure 8

Location of Water Supply Structures In Catskill Aqueduct System

AWS 3

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

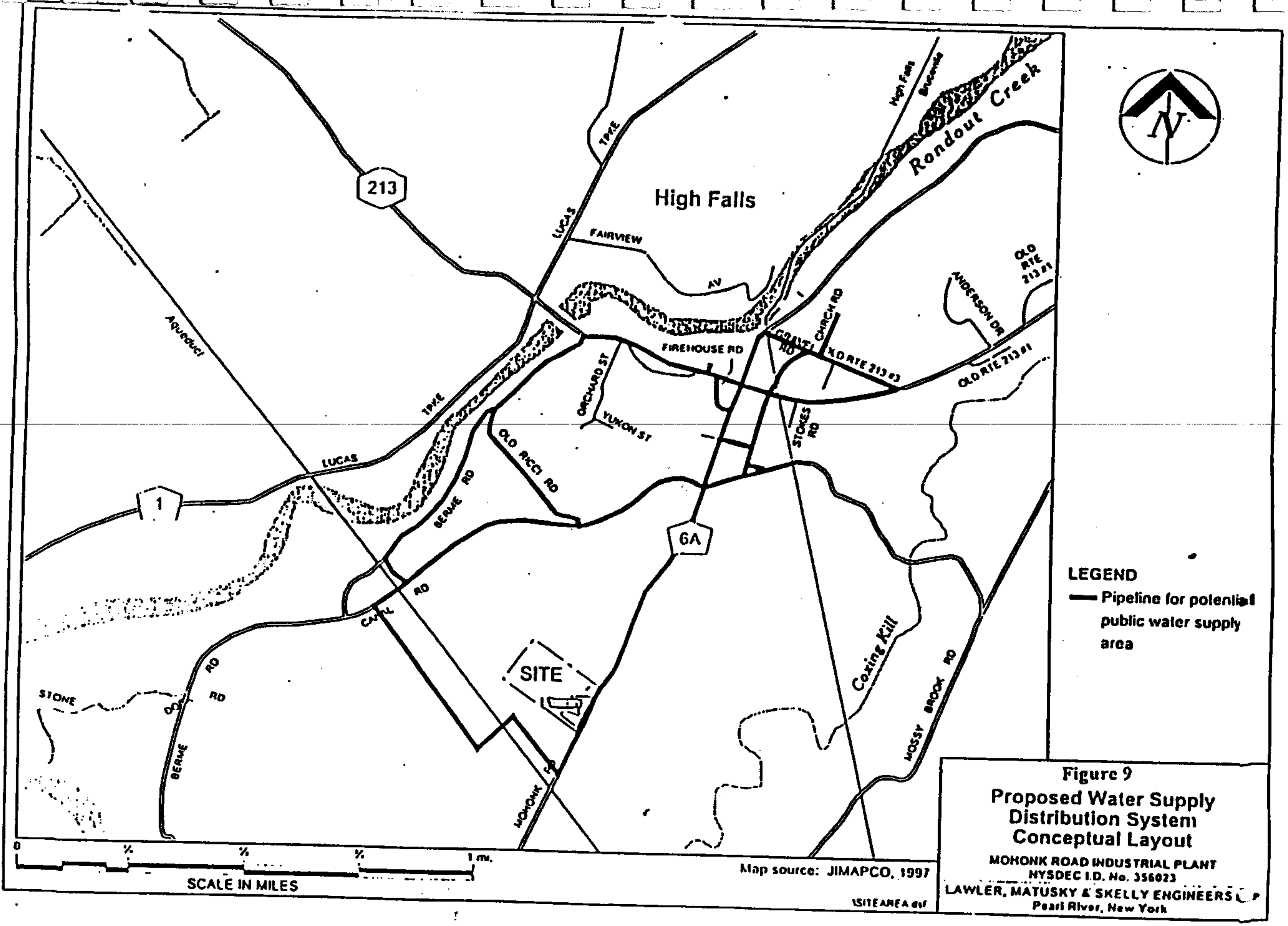
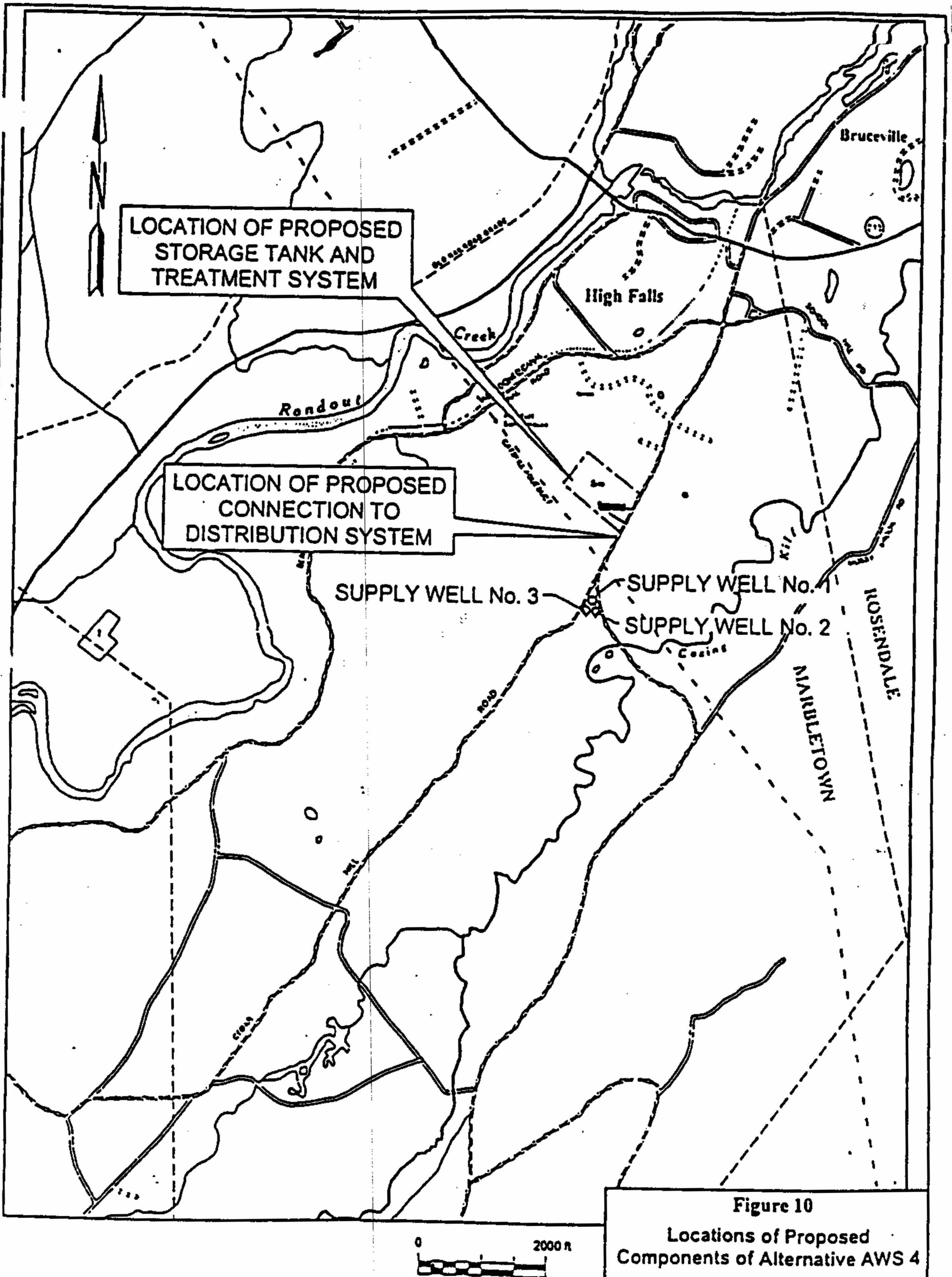


Figure 9
Proposed Water Supply Distribution System Conceptual Layout

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023
LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York



Map source. Based on
USGS 7.5-minute Quadrangle Map,
Mohonk Lake, NY, 1964.
Rosendale, NY, 1964, photorevised 1980.

Figure 10

Locations of Proposed Components of Alternative AWS 4

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

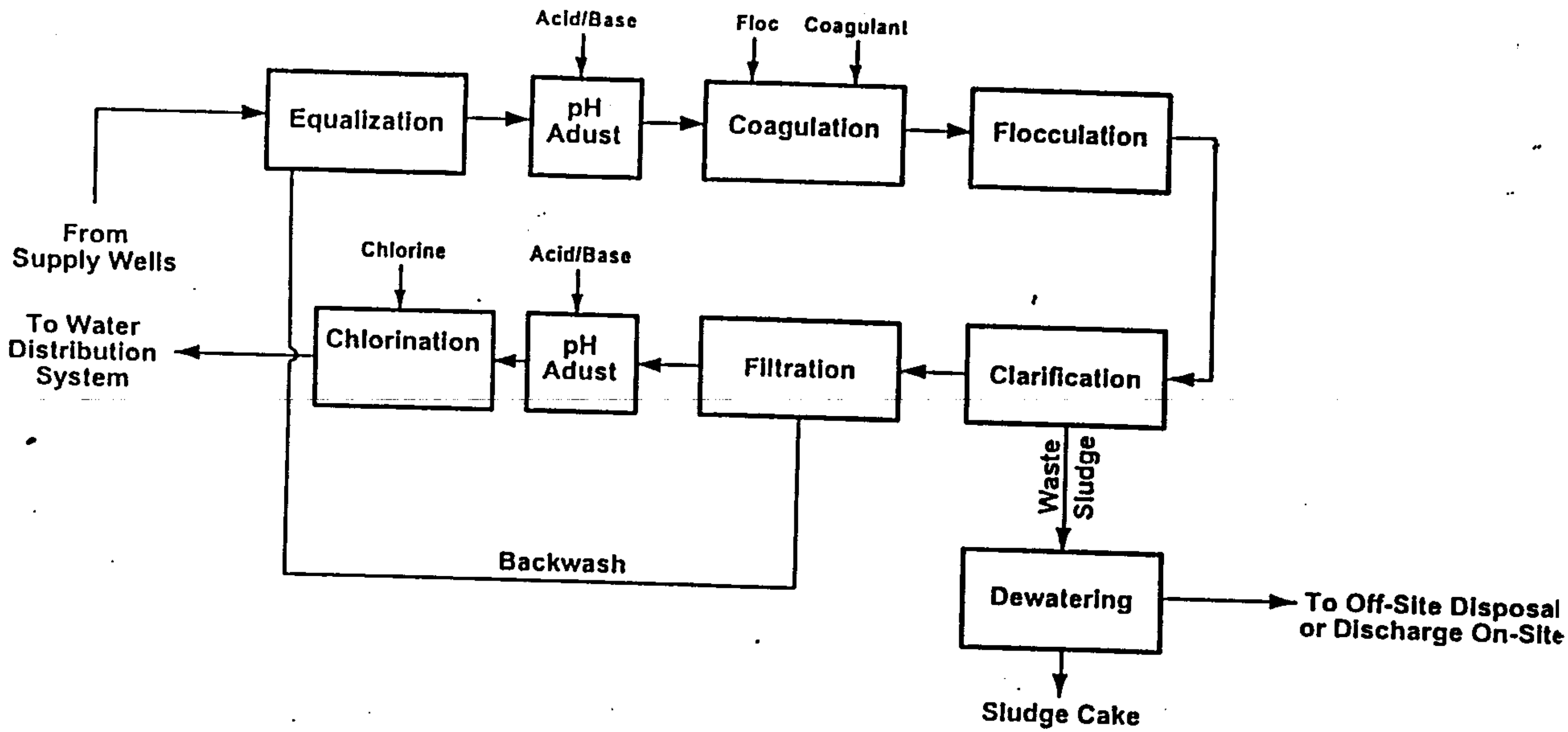
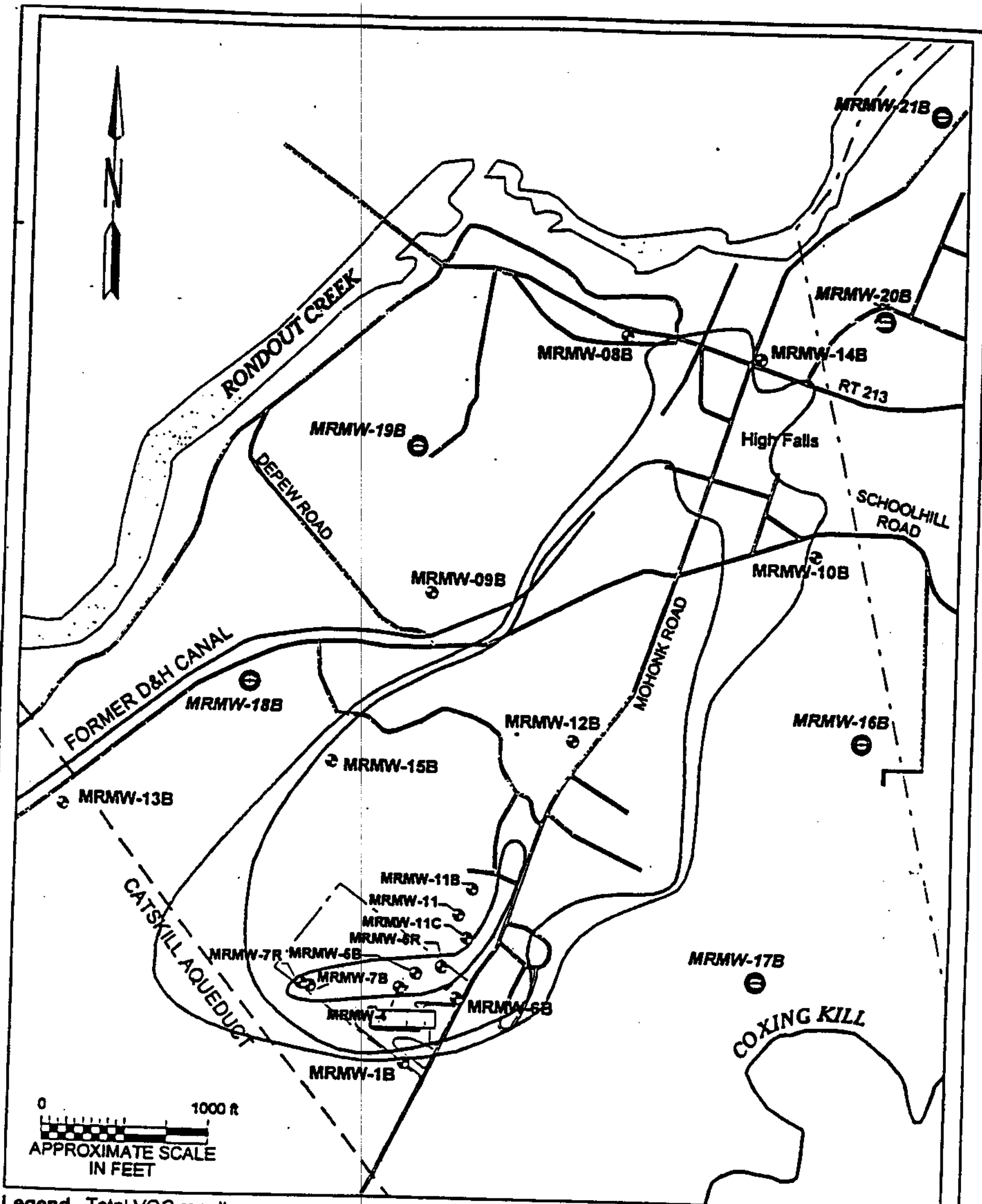


Figure 11

Treatment Units of Alternative AWS 4

MOHONK ROAD INDUSTRIAL PLANT
NYSDEC I.D. No. 356023

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York



Legend Total VOC results

10 µg/l

100 µg/l

1000 µg/l

10,000 µg/l

MRMW-11 Existing monitoring well

MRMW-17B Proposed monitoring well

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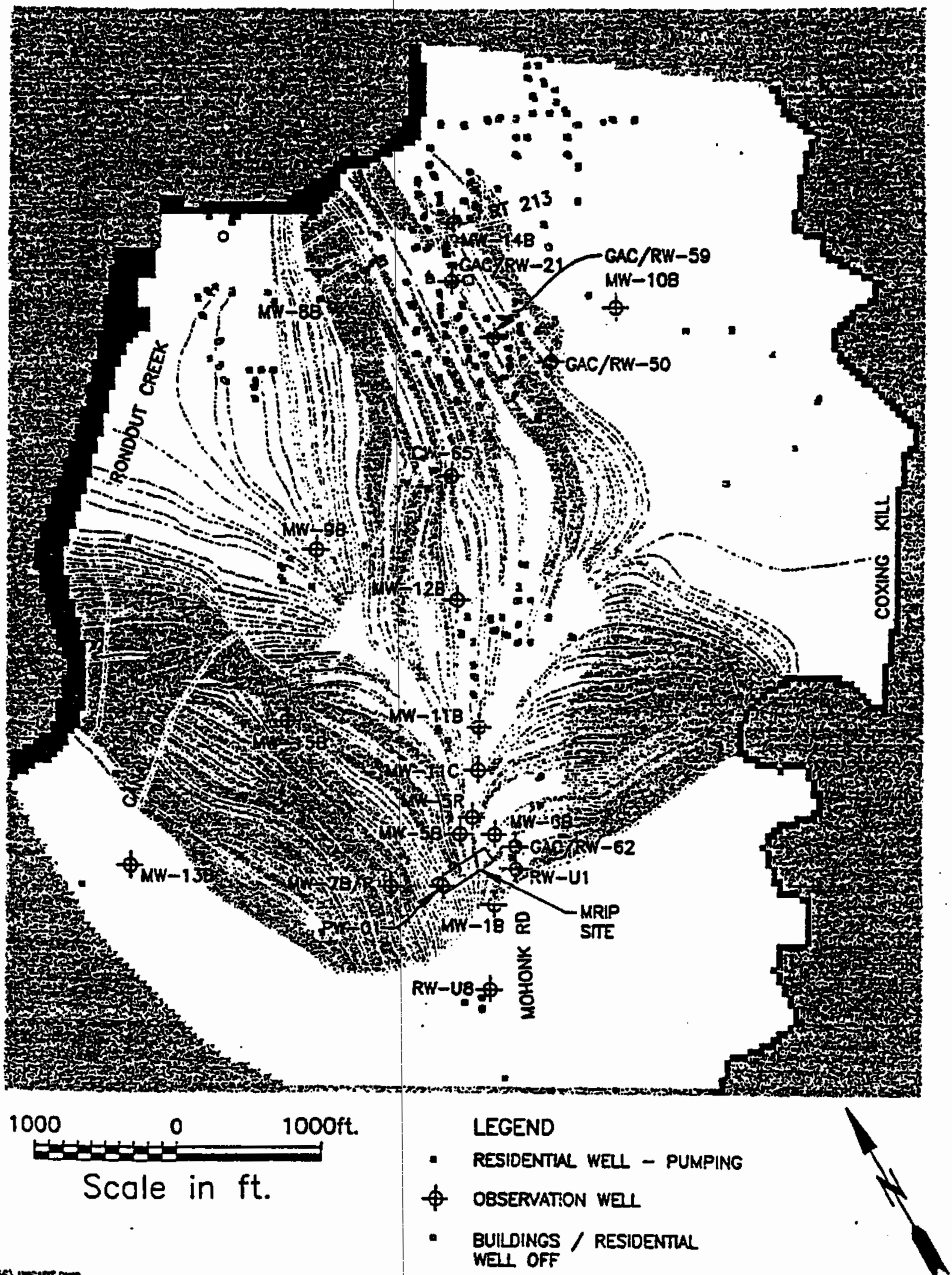
One Blue Hill Plaza • Pearl River, New York 10965
ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS

Proposed Monitoring Well Locations for Alternatives GR-1 & GR-2

Mohonk Road Industrial Plant **NYSDEC I.D. No. 356023**

Figure 12



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LMS Lawler, Matusky & Skelly Engineers LLP
One Blue Hill Plaza Pearl River, New York 10965
ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS

MOHONK ROAD INDUSTRIAL PLANT SITE
STEADY STATE PARTICLE TRACKING
EXISTING CONDITIONS

Figure 13

RESPONSIVENESS SUMMARY

Appendix B - Public Notice

The United States Environmental Protection Agency

and

New York State Department of Environmental Conservation

Announce the Release of a

Proposed Remedial Action Plan for the Mohonk Road Industrial Plant Superfund Site

High Falls, Ulster County, New York

The U.S. Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (NYSDEC) have released for public review and comment a Proposed Remedial Action Plan for the long-term cleanup of the Mohonk Road Industrial Plant (MRIP) Superfund Site located in High Falls, Ulster County, New York. The public comment period on this plan will run from **November 15, 1999 through January 15, 2000.** Comments may be sent to:

Pat Hamblin, Remedial Project Manager, U.S. Environmental Protection Agency
290 Broadway, 20th Floor, New York, NY 10007-1866

EPA and NYSDEC propose to:

① construct and begin operation of a new public water supply system to provide clean, safe potable water to the residences or businesses in the towns of Marbletown and Rosendale with impacted or threatened private supply wells. The source of this new public water supply would be the Catskill Aqueduct. **Note:** this would require the establishment of a community water district in the towns of Marbletown and Rosendale;

② construct and operate a groundwater extraction and treatment system to cleanup groundwater contamination that has migrated away from the MRIP property. **Note:** EPA will continue to operate the treatment system currently being constructed to address the grossly contaminated groundwater underlying the MRIP property;

③ excavate contaminated subsurface soils on the MRIP property and transport those soils to a waste treatment or disposal facility.

The full Proposed Remedial Action Plan (PRAP), which includes a summary of NYSDEC's comprehensive investigation of contamination at the site and evaluation of several long-term solutions to the contamination, is available for public review at the Stone Ridge and Rosendale Libraries.

The public also is invited to give EPA and NYSDEC comments on and discuss the plan at a **Public Meeting** being held on:

December 2, 1999
7:00 p.m.
High Falls Firehouse

EPA

EXTENDS PUBLIC COMMENT PERIOD
for the
Mohonk Road Industrial Plant Superfund Site
Proposed Remedial Action Plan

* * * * * * * * * *

thru
FEBRUARY 15, 2000

* * * * * * * * * *

EPA and the New York State Department of Environmental Conservation issued a proposed plan for the long-term cleanup of the site. EPA and NYSDEC propose to:

1. construct and begin operation of a new public water supply system to provide clean, safe potable water to the residences or businesses in the towns of Marbletown and Rosendale with impacted or threatened private supply wells. The source of this new public water supply is proposed to be the Catskill Aqueduct. Note: this would require the establishment of a community water district in the towns of Marbletown and Rosendale;

2. construct and operate a groundwater extraction and treatment system to cleanup groundwater contamination that has migrated away from the MRIP property. Note: EPA will continue to operate the treatment system it's currently constructing to address the grossly contaminated groundwater underlying the MRIP property;

3. excavate contaminated subsurface soils on the MRIP property and transport those soils to a waste treatment or disposal.

EPA relies on the public's input and comments when selecting a final cleanup plan. The full proposed plan is available for public review at the Stoneridge and Rosendale Libraries. Send your comments to:

Pat Hamblin, Remedial Project Manager
U.S. EPA - Emergency & Remedial Response Division
290 Broadway, 20th Floor
New York, New York 10007-1866

RESPONSIVENESS SUMMARY

Appendix C - December 2, 1999 Public Meeting Attendance Sheet

MOHONK ROAD INDUSTRIAL PLANT SITE
PUBLIC MEETING
DECEMBER 2, 1999

AME/ORGANIZATION	ADDRESS		PHONE/FAX	Check if you are already receiving mail from EPA
Robert Every	844 Lucas Ave	Hurley	339-8085	
[illegible]	[illegible]	[illegible]	687-4079	✓
Mr & Mrs Kenneth A Tokle	800 OLD Rt 213,	High Falls, 12440	687-7108	✓
Brenda Blanchard (Nathan Suchman)	60 Old Rt 213	High Falls 12440	6870253	
JAMES EATON	17 OLD RT. 213	High Falls 12440	6874960	✓
Elayne Kossuth	POB 126 - Kennedy Ln.	HF 12440	687-7165	✓
John Conrad Conrad Geoscience	8 Raymond Ave	Poughkeepsie NY 12603	914/454-2544	✓
Brian Pickard - wants	1033 Berme Road	High Falls NY 12440	914 6878756	
Roy Gumpel - wants well tested	old rt. 213	High Falls	6872109	
NATE RAND	52 ALBIE RD	RED HOOK	876-1765	✓
LARRY SERRAVALLI	14 BRUCEVILLE RD	HIGH FALLS	6879600	✓
THE JOHN HALLS	P.O. BOX 387	HIGH FALLS	6879407	
Ruth Bush	P.O. Box 253	High Falls	687 9493	
Daniel Koehler	41 Canal Road	High Falls	687-8939	✓
[illegible]	10 [illegible] RD	HIGH FALLS	687[illegible]	
MICHAEL J. AHEARN	985 BERME RD HIGH FALLS,		687-4192 FAX 339-9306 E-MAIL = JH 87125@AOL.COM	

MOHONK ROAD INDUSTRIAL PLANT SITE
PUBLIC MEETING
DECEMBER 2, 1999

NAME/ORGANIZATION	ADDRESS	PHONE/FAX	Check if you are already receiving mail from EPA
MAURA ELLYN	52 CANAL RD.	687-9150	✓
Phil Terpening	270 Whiteport Rd - Kingston, N.Y 12401	340-1667	

MOHONK ROAD INDUSTRIAL PLANT SITE
PUBLIC MEETING
DECEMBER 2, 1999

NAME/ORGANIZATION	ADDRESS	PHONE/FAX	Check if you are already receiving mail from EPA
Emmett McGuire	222 Mohonk Rd.	687-4550/687-4228	
MARK McLEAN	33 BONE HOLLOW RD	687-4303	
Patrick Kemple	138 Mohonk Rd.	687-9109	✓
Allan Dumas, UCHD	300 Flatbush Ave., Kingston	914-340-3035	–
KEVIN COTHREN	PO BOX 27 STEEPHILL RD.	687-4292	✓
JAMES J. BRADY	mail address → 90 BALLARD RD GANSEVOORT N.Y. 26-050-213 HIGH FALLS N.Y.	518-583-6051	• copy of transcript
Filomena Brady	SAME AS ABOUT		
LARRY Ricci	30 Depew RD	687-4168	
Steve & Carol Kastanis	1054 Berme Rd HF	687-9532	✓
Martin Koehler	41 Canal RD H.F	687-8939	
MICHAEL KEATING	22 CORNICEDALE LANE	687-7245	
Robert L. Homm	24 Mohonk Rd	687-9552	✓
PAT ROWE	157 Woodland Rd Stone Ridge	657-6227	
PAT MARSH	Tillson NY	658-7541	
Nancy Donohue	112 School Hill Rd HF	687-7546	

MOHONK ROAD INDUSTRIAL PLANT SITE
PUBLIC MEETING
DECEMBER 2, 1999

NAME/ORGANIZATION	ADDRESS	PHONE/FAX	Check if you are already receiving mail from EPA
DAVID URSO	1204 STATE RT. 213 HIGH FALLS	687-4410	✓
Richard Murphy	PO Box 242 High Falls NY	687-4398	✓
Thomas M. Crispell	10 PROSPECT ST. MODENA, NY 12548	883-7807	
Ron Rosa	20 Bone Hollow Rd. Accord NY	687-0884	
KELLY HOULIHAN	PO BOX 420 HIGH FALLS	255-0749	
Bob Allen	MOHONK Rd HIGH FALLS	255-0749	
SUSAN PARKIN-HINES	CANAL RD	687-9333	✓
" "	PO Box 241, ROCK CLIFF HOUSE HIGH FALLS	687-9913	

RESPONSIVENESS SUMMARY

Appendix D - Letters Submitted During the Public Comment Period

COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEES:
AGRICULTURE, RURAL DEVELOPMENT, FOOD AND DRUG ADMINISTRATION, AND RELATED AGENCIES
INTERIOR

Congress of the United States
House of Representatives
Washington, DC 20515–3226

WASHINGTON, DC 20515–3226
(202) 225–6335

BINGHAMTON OFFICE:
100A FEDERAL BUILDING
BINGHAMTON, NY 13901
(607) 773–2768

KINGSTON OFFICE:
291 WALL STREET
KINGSTON, NY 12401
(914) 331–4466

ITHACA OFFICE:
123 S. CAYUGA ST., SUITE 201
ITHACA, NY 14850
(607) 273–1388

MONTICELLO OFFICE:
(914) 791–7116

February 15, 2000

U.S. Environmental Protection Agency
Mr. Patrick Hamblin
Remedial Project Manager
290 Broadway, 20th Floor
New York, NY 10007-1866

Dear Mr. Hamblin:

Rosendale Town Supervisor Jeannie F. Laik, has requested my assistance regarding the proposed High Falls Water District. Enclosed please find information which explains the situation.

As you can see, the Towns of Rosendale and Marbletown are attempting to obtain reimbursements that are required to create the proposed High Falls Water District. I support this request and would appreciate it if you would look into this matter. Please respond to John Svare, in my Kingston District Office listed above.

Thank you for your assistance.

Sincerely,

Maurice D. Hinchey

MDH/jds
Enclosure

Cc: Jeannie F. Laik
Tom Jackson

JAN 18 2000

Rosendale Town Supervisor

(914) 658-3159

PO Box 423
Rosendale, NY 12472

January 18, 2000

Honorable Maurice Hinchey
291 Wall Street
Kingston, New York 12401

Dear Congressman Hinchey,

We are attempting to obtain reimbursement from the United States Environmental Protection Agency for the costs required to create the proposed High Falls Water District. As the result of contamination and through no fault of their own the residents of the area are faced with financial hardship and the water district will start with a deficit as a result.

We are respectfully requesting that you write a letter to the US Environmental Protection Agency and request that they reimburse the Towns of Rosendale and Marbletown for the expenditures that are required to create the proposed High Falls Water District.

We appreciate any assistance you can give us in this matter.

Very truly yours,

Jeannie F. Laik

Jeannie F. Laik
Supervisor

JOHN J. BONACIC
SENATOR, 40TH DISTRICT

THE SENATE
STATE OF NEW YORK

CHAIRMAN
COMMITTEE ON
HOUSING, CONSTRUCTION &
COMMUNITY DEVELOPMENT

COMMITTEES
BANKS
COMMERCE, ECONOMIC DEVELOPMENT
& SMALL BUSINESS
JUDICIARY
LABOR
LOCAL GOVERNMENT

January 31, 2000

Mr. Richard Caspe, Director
U.S. Environmental Protection Agency
Remedial Response Division
290 Broadway, 20th. Floor
New York, NY 10007-1866

Dear Mr. Caspe:

I am writing in support of the request from the Towns of Rosendale and Marbletown to obtain reimbursement for the expenditures that are required to create the proposed High Falls Water District.

The residents of the area are faced with a financial hardship as the result of a contamination they did not create.

Any assistance you can provide would be greatly appreciated.

Sincerely,

JOHN J. BONACIC
State Senator

JJB:sc
cc: Congressman Hinchey
Jeannie Laik

☐ ALBANY OFFICE, ROOM 815 LEGISLATIVE OFFICE BUILDING, ALBANY, NY 12247 (518) 455-3181
☑ DISTRICT OFFICE, 279 MAIN STREET, SUITE 202, NEW PALTZ, NY 12561 (914) 255-9656
☐ DELAWARE CO OFFICE, 111 MAIN STREET, DELHI, NY 13753 (607) 746-6075

KEVIN A. CAHILL
Assemblyman 101st District

THE ASSEMBLY
STATE OF NEW YORK
ALBANY

COMMITTEES
Health
Higher Education
Economic Development, Job Creation, Commerce & Industry
Consumer Affairs

January 31, 2000

United States Environmental Protection Agency
Patrick Hamblin, Remedial Project Manager
290 Broadway, 20th Floor
New York, New York 10007-1866

Dear Mr. Hamblin:

I write to join in the request from Supervisors Jeannie Laik and Tom Jackson for financial assistance to start the proceedings to create a water district in the hamlet of High Falls. The communities in Rosendale and Marbletown have already suffered hardship due to the contamination at the Mohonk Road Industrial Plant. Adding the financial liability of creating a water district to these municipalities is an onerous burden. The payment of administrative costs relating to the formation of this district would be a great benefit to the residents in these townships and allow them to restore the high quality and safety of their water sources, tainted through no fault of their own.

I appreciate your consideration of this request. If I can provide any additional information or assistance regarding this, please do not hesitate to contact me.

Sincerely,

Kevin Cahill

Kevin A. Cahill
Member of Assembly

cc: Jeannie F. Laik, Supervisor
Tom Jackson, Supervisor

KAC/lg

Room 527, Legislative Office Building, Albany, New York 12248, (518) 455-4436, FAX (518) 455-5576
Governor Clinton Building, 1 Albany Avenue, Suite G-4, Kingston, New York 12401, (914) 338-9610, FAX (914) 338-9590
E-mail: cahillk@assembly.state.ny.us

Town of Rosendale
Jeannie Fleming-Laik
P.O. Box 423
Rosendale, New York 12472
Phone 914-658-3159

Town of Marbletown
Tom Jackson
P.O. Box 217
Stone Ridge, New York 12484
Phone 914-687-7601

January 18, 2000

U.S. Environmental Protection Agency
Remedial Response Division
Richard Caspe, Director
290 Broadway, 20th Floor
New York, New York 10007-1866

Dear Mr. Caspe,

The enclosed correspondence was sent to Patrick Hamblin, Remedial Project Manager on September 14, 1999.

As we are sure you are aware, the proposed High Falls Water District will start with a deficit for a contamination they had no part of. The Town Boards of Marbletown and Rosendale have worked together to keep all costs at a minimum so as to reduce the financial burden.

At the July 29, 1999 joint Town Board meeting, the Town Boards of Rosendale and Marbletown authorized the expenditure of $14,500.00 for the preparation of the map, plan, report, and legal fees which is a requirement for said proposed district.

Therefore, the Towns of Marbletown and Rosendale respectfully request reimbursement for the expenditures that are required to create the proposed High Falls Water District.

Very truly yours,

Jeannie F. Laik

Jeannie F. Laik

Very truly yours,

Tom Jackson

cc: Patrick Hamblin U.S. EPA Remedial Project Manager
Honorable Maurice Hinchey, 26th Congressional District
Honorable John H. Bonacic, 40th Senatorial District
Honorable Kevin Cahill, 101st Assembly District

Town of Rosendale
Jeannie Fleming-Laik
P.O. Box 423
Rosendale, New York 12472
Phone 914-658-3159

Town of Marbletown
Tom Jackson
P.O. Box 217
Stone Ridge, New York 12484
Phone 914-687-7601

September 14, 1999

U.S. Environmental Protection Agency
Patrick Hamblin
Remedial Project Manager
290 Broadway, 20th Floor
New York, New York 10007-1866

Dear Patrick,

On behalf of the Town Boards of Rosendale and Marbletown, please consider this letter a formal request for financial assistance to start the proceedings to create a water district in the hamlet of High Falls.

At the July 29, 1999 joint Town Board meeting, the Town Boards of Rosendale and Marbletown authorized the expenditure of $14,500.00 for the preparation of the map, plan, report, and legal fees for the creation of the proposed High Falls Water District.

The proposed district is creating a financial hardship to the residents of this area through no fault of their own. The water district will start with a deficit that they did not create nor do they want.

Therefore, since no responsible party has been found, as of yet, for the contamination, both municipalities are requesting assistance to relieve the burden of financing the development of the new water district.

We would appreciate serious consideration be given our request.

As always should you have any questions please do not hesitate to contact me.

Very truly yours,

Jeannie F. Laik

Jeannie F. Laik

Very truly yours.

Tom Jackson

MARTIN F. TULLY
JAMES L. MELBERT

TEL. 255-0403
AREA CODE 914
FAX. 255-0838

TULLY AND MELBERT
Counsellors at Law
176 MAIN STREET
P. O. BOX 574
NEW PALTZ, NEW YORK 12561-0574

November 22, 1999

Mr. Patrick Hamblin, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 20th Floor
New York, N.Y. 10007-1866

RE: Mohonk Road Industrial Plant Site

Dear Mr. Hamblin:

I reside at 1 Dutch Barn Drive, High Falls, New York, less than a 1/2 mile to the East of the above contamination site.

I enclose EPA News letter for November 1999 and marked in red a particular paragraph in the upper left column. Frankly I do not understand the last sentence, and ask for your clarification.

My private well was tested this past July for contamination by a Mr. Gregory Mapstone, Senior Public Health Engineer, Ulster County and the water is found to be of satisfactory quality.

Thank you for your attention.

Very truly yours,

Martin F. Tully

MFT/mm
encs

Important News

Superfund Program

EPA

Region 2

Mohonk Road Industrial Plant Site

High Falls, New York

November 1999

EPA and New York State Propose a Long-Term Cleanup Plan for the Mohonk Site:

The United States Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (NYSDEC) have released for public review and comment a Proposed Remedial Action Plan (PRAP) for the long-term cleanup of the Mohonk Road Industrial Plant (MRIP) site. This plan is available at the information repositories listed below. The site is located in the Hamlet of High Falls and was occupied from the early 1960s until 1992 by various business that used chemicals or solvents in their operations.

After completing a comprehensive site investigation to determine the nature and extent of the contamination and evaluating various cleanup options, NYSDEC, with assistance from EPA, prepared a Proposed Remedial Action Plan (PRAP) outlining the preferred alternatives to protect human health and the environment from the site contamination. **The primary goals of the plan are to:**

1. eliminate human exposure to groundwater contaminated by the MRIP site that does not meet state or federal drinking water standards;
2. restore the groundwater contaminated by the MRIP site to meet drinking water standards and prevent the contaminated groundwater from spreading and further impacting the aquifer;
3. eliminate the potential for human exposure to any contaminants in subsurface soils on the MRIP property or the release of those contaminants into the groundwater.

EPA and NYSDEC Propose to:

1. construct and begin operation of a new public water supply system to provide clean, safe potable water to the residences or businesses in the towns of Marbletown and Rosendale with impacted or threatened private supply wells. The source of this new public water supply is proposed to be the Catskill Aqueduct. **Note:** this would require the establishment of a community water district in the towns of Marbletown and Rosendale;
2. construct and operate a groundwater extraction and treatment system to cleanup groundwater contamination that has migrated away from the MRIP property. **Note:** EPA will continue to operate the treatment system currently being constructed to address the grossly contaminated groundwater underlying the MRIP property;
3. excavate contaminated subsurface soils on the MRIP property and transport those soils to a waste treatment or disposal.

MARK YOUR CALENDAR !

December 2, 1999
Public Meeting
to discuss and give EPA your comments on the proposed plan
7:00 p.m.
High Falls Firehouse

November 15, 1999 thru January 15, 2000
Public Comment Period
on Proposed Long-Term Cleanup Plan for the Mohonk Site.

The total estimated cost for this proposed plan is $14,869,000. EPA will select and be the lead agency responsible for the final cleanup plan. EPA is continuing it's investigations to identify parties responsible for the contamination. EPA typically offers such parties the opportunity to pay for and implement the final plan. If the responsible parties are not willing or able to do so, EPA will pay for and undertake the long-term cleanup work under the federal Superfund program and subsequently seek to recover its cleanup cost from those parties.

Why are EPA and NYSDEC proposing this plan?

NYSDEC evaluated several approaches to address each of the three primary areas of concern: safe potable water supply, groundwater contamination and soil contamination. The combination of alternatives outlined in this proposed plan will allow EPA to effectively address all of these areas at the same time and best meet the criteria used to evaluate cleanup plans under Superfund. These criteria include: protection of human health and the environment, short-term and long-term effectiveness, implementability, cost and conformity with existing laws and regulations.

Why can't those properties with contaminated private wells just use the individual treatment units that are already working?

EPA and NYSDEC did consider and evaluate the option of the continuing the use of the individual treatment systems that NYSDEC already has installed on 70 contaminated private wells and installing new ones where additional wells are threatened. However, if this alternative were selected, EPA would not be able to operate a treatment system to cleanup the contaminated groundwater that has moved off the MRIP property because nearby private wells could run dry.

If the alternative of constructing a public water system is selected, the NYSDEC will continue to maintain the individual treatment systems until the new public water supply is available.

Who will receive water from the new public water supply system?

EPA, NYSDEC and the Ulster County Department of Health have identified the boundaries of a proposed public water service area (PWSA), which includes all properties currently impacted or considered threatened by contamination from the MRIP site. The PWSA is comprised of 174 lots in the towns of Marbletown and Rosendale, of which approximately 143 are currently developed for municipal, residential or commercial use and contain private wells.

A map of the specific lots within the PWSA is included in the Feasibility Study, which is available for public review at the Stone Ridge Library and Rosendale Libraries.

More about the proposed public water system...

In order for EPA to construct a public water system, the towns of Marbletown and Rosendale must first establish a community water district for the long-term maintenance and operation of the public water supply system.

In addition, if the Catskill Aqueduct is selected as the source for the new water system, the towns of Marbletown and Rosendale and the New York City Department of Environmental Protection must establish a use agreement, which is an option available to towns through which the aqueduct runs.

A backup system would also be constructed to supply drinking water during periods of time when the Catskill Aqueduct is temporarily out of service. Sources currently considered for the backup supply are the Roundout Creek and a well in an uncontaminated area of the aquifer.

In accordance with the federal Safe Drinking Water Act and the Surface Water Treatment Rule, the raw water from the Catskill Aqueduct and the backup source would be treated with a conventional treatment system, including filtration and disinfection.

Contacts at EPA

Patrick Hamblin, Remedial Project Manager
(212) 637-3314
Hamblin.Patrick@epamail.epa.gov

Mary Helen Cervantes-Gross, Community Involvement Coordinator
(212) 637-3675
Cervantes.Mary@epamail.epa.gov

Dave Rosoff, On-Scene Coordinator
(732) 906-6879
Phone at MRIP Site: (914) 687-7113

State and Local Contacts

Mike Komoroske, NYSDEC Project Manager
(518) 457-3395
mjkomoro@gw.dec.state.ny.us

Geoff Laccetti, NYS Department of Health
(518) 402-7880 or 1-800-458-1158:ext. 2-7880

Greg Mapstone, Ulster County Health Department
(914) 340-3031

Send Us Your Comments !

Send your comments through **January 15, 2000** to:

Patrick Hamblin, Remedial Project Manager
290 Broadway, 20th Floor
New York, NY 10007-1866

EPA relies on public input to ensure that the concerns of the community are considered when selecting cleanup plans for each Superfund site. EPA has extended the normal 30-day comment period to 60 days to allow the community additional time to review and comment on this plan.

Before selecting a final cleanup plan for this site, EPA will prepare a written response to all public comments in a **Responsiveness Summary** document, which will be placed in the site information repositories.

Information Repositories

Now available for public review at the Rosendale and Stone Ridge Libraries and offices of the EPA and NYSDEC:

Proposed Remedial Action Plan and other documents related to the site, including site history documents, investigation reports and information about EPA and NYSDEC interim cleanup actions.

High Falls Water Coalition, Inc.
P.O. Box 44
High Falls, NY 12440

December 9, 1999

Mr. Patrick Hamblin
Remedial Project Manager
EPA
290 Broadway, 20th Floor
New York, New York 10007-1866

SUBJECT: EXTENSION OF PUBLIC COMMENT PERIOD FOR MRIP PRAP

As you know, our organization is in the process of hiring our technical advisors. While we have selected a firm and are beginning contract negotiations, due to the upcoming holidays, we will not be able to complete this process until the beginning of the New Year. We feel that it is critical that our technical advisors be given at least a few weeks to examine the background material and PRAP in order to provide us with enough information to make an informed response to the EPA. Therefore, the High Falls Water Coalition requests that the public comment period for the MRIP PRAP be extended an additional 30 days, to conclude on February 15, 2000.

Considering that our organization just received funding in September, and the detailed procurement procedures that EPA requires us to follow, we feel that we have done an excellent job of moving ahead with the selection and hiring of our advisors. We now need adequate time for those advisors to do their job.

Thank you for your attention to this important matter.

Sincerely,

GRETCHEN REED
President, High Falls Water Coalition

Cc: Mr. Tom Jackson, Marbletown Town Supervisor
Ms. Jeannie Fleming-Laik, Rosendale Town Supervisor
Mr. John Andrews, Rhode, Soyka & Andrews

TOWN OF MARBLETOWN

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SUPERVISOR
687-9673

TOWN
CLERK
687-7601

JUSTICE
687-1328

HIGHWAY
687-9613

BUILDING
687-7500

PLANNING
/ZONING
687-7500

ASSESSOR
687-9523

YOUTH
/RECREATION
687-0800

TAX
COLLECTOR
687-7601

FAX
914-687-9068

December 10, 1999

Mr. Patrick Hamblin, Project Manager
Emergency & Remedial Response Division
290 Broadway, 20th Floor
New York, NY 10007-1866

Re: Mohonk Road Industrial Plant Site

Dear Pat:

I am writing this letter on behalf of the Marbletown Town Board to support the High Falls Water Coalition's request that the public comment period for the Proposed Remedial Action Plan be extended to February 15, 2000. We would like to assure that the coalition has adequate time to retain technical advisors and to make an informed response within the public comment period.

Also, based on discussion with Town Board members and other interested parties, I would like to request that the PRAP be amended to include an evaluation of the feasibility of utilizing the extracted groundwater for the backup water supply for the proposed water district.

The Town Board members also request that the proposed water supply distribution pipeline along Berme Road be extended southwesterly along Berme Road to its intersection with Canal Road.

Thank you for your anticipated cooperation in this matter.

Very truly yours,

Thomas H. Jackson, Jr.
Supervisor

THJ:ch

cc: Gretchen Reed, President - High Falls Water Coalition
Jeannie Laik - Supervisor, Town of Rosendal
Marbletown Town Board
Dennis Larios, P.E.
Lewis C. Di Stasi, Jr., Esq.

Jeannie Fleming-Laik
Rosendale Town Supervisor

(914) 658-3159
Fax (914) 658-8744

PO Box 423
Rosendale, NY 12472

December 13, 1999

Patrick Hamblin, Project Manager
Emergency & Remedial Response Division
290 Broadway, 20th Floor
New York, New York 10007-1866

Re: Mohonk Road Industrial Plant Site

Dear Pat:

On behalf of the Town Board of the Town of Rosendale, we respectfully request that the public comment period for the Proposed Remedial Action Plan, (PRAP) be extended to February 15, 2000. The High Falls Water Coalition requires additional time to seek a technical consultant to advise the Coalition.

Thank you for your anticipated cooperation on this matter. Should you have any questions, please do not hesitate to contact me.

Very truly yours,

Jeannie F. Laik

JEANNIE F. LAIK
SUPERVISOR

JFL:js

cc: Gretchen Reed, President, High Falls Water Coalition
Supervisor Thomas Jackson, Marbletown
Dennis Larios, P.E.
Lewis De Stasi, Esq.
Rosendale Town Board

18 Bruceville Rd.
High Falls, NY 12440

Dec. 27, 1999

Mr. Patrick Hamblin, Project Mgr. EPA
EPA
Emergency & Remedial Response Div.
290 Broadway, 20th Floor
New York, NY 10007-1866

Dear Mr. Hamblin,

I have some comments on The Proposed Remedial Action Plan concerning the Mohonk Road Industrial Plant Site, dated November 1999.

1. Please refer to Figure 9 - Proposed Water Supply - as of this date, properties located along Bruceville Road(which my property is located), Gravel Road, old Rte 213 #3, and other properties located north of route 213 in this area have not been affected the contamination from the Industrial Plant in question, and I doubt very much will be, as the main source has been eleminated for some years.
2. The Proposed Water Service Area Boundries indicate 174 properties and 143 lots with private wells. The estimate cost per user would be $369 to $448, using the Aqueduct, as a water supply using a Well Field would be $506 to $615. In either case the cost would be a financial burden on many retirees on fixed incomes.
3. If a Water Supply Distribution system was approved, who would pick up the cost of equipment failures?

The Proposed Remedial Action Plan is a good plan, but there aren't enough properties on the present plan to defray the cost. High Falls Park, High Falls, NY has Well Field for a water supply, and their annual cost is $240.

Yours truly,

Alfred Friedman

Alfred Friedman

Jeannie Fleming-Laik
Rosendale Town Supervisor

(914) 658-3159
Fax (914) 658-8744

PO Box 423
Rosendale, NY 12472

January 20, 2000

Patrick Hamblin, Project Manager
Emergency & Remedial Response Division
290 Broadway, 20th Floor
New York, New York 10007-1866

Re: Mohonk Road Industrial Plant Site

Dear Pat:

On behalf of the Town Board of the Town of Rosendale we extend our sincere appreciation for the extension on the public comment period for the Proposed Remedial Action Plan.

The Town Board members request that the boundaries of the proposed water district be extended to include the following properties:

1) 77 School House Road, lot 70.1-2-28.100
Property Owners: Kenneth and Marie Johnson
15 Strawberry Bank Road
High Falls, New York 12440

2) 15 Strawberry Banks Road, lot 70.1-2-28.100
Property Owners: Kenneth and Marie Johnson
15 Strawberry Bank Road
High Falls, New York 12440

This is the actual property that the Johnson residence is located. Paul Lendvay is constructing a house on a portion of the Johnson property that is located at 77 School House Road. It is anticipated that in the future the property will transfer to the Lendvay's as owner. A separate lot reference number will be assigned at that time.

3) 1061 Route 213, lot 70.1-2-29.00, this is the motel property. Property Owners; Lorna & Henry Schimmrich
1061 Route 213
High Falls, New York 1240

4) 1 Dutch Barn Drive, lot, 70.1-2-25
Property Owners: Martin & Jeannine Tully
High Falls, New York 12440

Please take note of the property map numbers. Some or the numbers given to me were incorrect. The Town Board requests serious consideration be given to our request.

As always, should you have any questions, please do not hesitate to contact me.

Very truly yours,

Jeannie F. Laik

JEANNIE F. LAIK
SUPERVISOR

JFL:jcs

cc: Honorable Thomas Jackson, Supervisor, Town of Marbletown
Gretchen Reed, President, High Falls Water Coalition
Dennis Larios, PE, Brinnier and Larios, P.C.
Lewis C. DiStasi, Jr. Esq.
Rosendale Town Board
Michael Komoraske, RI/FS Project Manager, NYS DEC
Alan Dumas, Ulster County Health Department

92 Mossybrook Rd.
High Falls, NY 12440
February 1, 2000

Mr. Patrick Hamlin
Environmental Protection Agency
Project Manager
290 Broadway
20th Floor
New York, NY 10007

Dear Mr. Hamlin:

I am a resident of High Falls and own land that borders the proposed High Falls water district.

I want to go on record as requesting that my water be tested before the High Falls water district is established.

My land is listed as land bordering the proposed High Fall Water District. This water district is proposed as a component of the Proposed Remedial Action Plan (PRAP) dated November 19, 1999 to address groundwater contamination which has impacted and threatened private supply wells in the High Falls area.

I want to also be assured that if my water (private well) is found to have groundwater contamination the problem will be corrected at no cost to me.

If you need additional information, you may contact me at the above address.

Thank you

Sincerely,

Raymond B. Sykes

Elayne Kossuth
POB 126 - Kennedy Lane
High Falls, NY 12440

Pat Hamblin, Remedial Project Manager
U.S. EPA - Emergency & Remedial Response Div.
290 Broadway - 20th Floor
New York, NY 10007-1866

February 3, 2000

Re: Mohonk Rd. Superfund Site

Dear Mr. Hamblin;

Having attended the Residents' Forum for the PRAP at the High Falls Fire House last evening, I have been left feeling a bit victimized by the news that the present thinking, on the part of the EPA and the DEC, is that the hook-up to the proposed water district by all residents within the proposed district is to be mandatory. AND that all wells on said residents property are to be considered 'abandoned' and 'sealed'.

While I applaud the efforts already made on the part of all parties involved, I feel that this latest trend in thinking smacks a good deal of "Big Brotherism". I understand the reasoning behind the non-use of wells by residents hooked-up to the water system, i.e., cross-contamination, etc. John Andrews of the engineering firm of Rhode, Soyka & Andrews, the firm providing technical assistance to the High Falls Water Coalition, explained all that quite well. And while I was considering hooking-up, even though my property lies in Rosendale near the edge of the proposed area, and is presently unaffected, I am not quite ready to sacrifice my well in such a manner.

My well was drilled in the end of the sixties, in the fifth year of a five-year drought and at a time when many of the wells in the area were still dry. It came in at the amazing rate of 100 gallons per minute! At the time the well-driller, Eckerson of Milton, stated that it was pure dumb luck to find such a vein and that 6 inches either way could have missed it. I feel that my well is not connected to the aquifer in question and will not likely be affected by the draw-down, either volume-wise or an increase in contamination. If I'm wrong, and I may be, then the expense of hooking up or filtration should be borne by me. I feel that when we are nearer to completion of the laying of the water lines then, and only then, the residents should be given the option of connecting or not. A release could be signed absolving any regulating parties from any further financial responsibility. Until then, with a 3 to 5 year forcast for completion, bi-annual or quarterly tests should be done and results would perhaps change the minds of die-hards like myself. And there seems to many of us die-hards around!

There may be other ways to resolve this problem, but I can't see that mandatory connections and well closures should be implemented or even considered at this stage. And I realize that there are many facts to be weighed and concerns to be addressed and that a lot of this will fall on those now is the area affected. I also have been informed that no one on the Town Boards of either township resides in the designated area. While I realize it is important that the water district be composed of a representative sampling, it appears that many of these decisions are being made BEFORE the water district is organized. Even though many things must be decided as quickly as possible, certainly some decisions can and should be made by the people more directly involved, and considering the time-frame, not neccesarily immediately?

I have been told by parties who have been involved in this type of formative process before that this is the time for any kicking and screaming. So please put me on record as being someone who, while lauding many of the plans and the efforts put forth, still feels not quite ready to jump on board and embrace "Big Brother".

Yours truly,

Elayne Kossuth

Elayne Kossuth

cc: Jeanne Laik, Supervisor
Town of Rosendale

Tom Jackson, Supervisor
Town of Marbletown

ANDREW LEE SILVERMAN, PH.D.
EMMETT J.P. MCGUIRE

222 Mohonk Road
High Falls, New York 12440
Phone: (914) 687-4350
(914) 687-4550
Fax: (603) 699-7700

February 8, 2000

Mr. Patrick Hamblin
Remedial Project Manager
EPA
Emergency & Remedial Response Division
290 Broadway, 20th Floor
New York, New York 10007-1866

Dear Mr. Hamblin:

This letter is in regard to the Proposed Remedial Action Plan, Mohonk Road Industrial Plant Site, (MRIP), High Falls, New York, Site Number 3-56-023.

Our property at 222 Mohonk Road is immediately south of the MRIP site, outside of the contaminated area and just beyond the boundaries of the proposed water district. We are concerned that our water supply may be diminished, and possibly depleted, by the on-site "pump and treat" activity, (GR2 - active treatment of the nearfield plume), that is scheduled to commence in a few weeks. It is our understanding that once this process starts, it is expected to continue for the next 30 or more years.

Our well is 85 feet deep and our pump is set at a depth of 80 feet. Last August, in the midst of the drought, we used a plumb line in our well and measured only 22 feet of remaining water. We were told by Dave Rosoff, the on-scene coordinator for the EPA, that he expects our well to experience 10 or more feet of "draw down" as a result of the "pump and treat" activity. Given a year in which a similar or more severe drought occurs, our property could be left without any water whatsoever.

The EPA wells on the MRIP site are much deeper than ours. It is our understanding that the pumps in the MRIP wells are at a depth of 175 to 225 feet - two to three times the depth of our pump. The EPA wells could continue pumping water long after our well would run dry. Are there safeguards in place so that this cannot happen?

We have several questions that have not been completely answered:

What plans are in place to assure that the pumping does not dry up residential wells in the immediate vicinity of the MRIP?
Sentinel wells have been placed at various points along the edge of the plume. It is unclear to us how and how often the actual level of the water table will be monitored. We have also been told that the sentinel wells may not accurately monitor unexpected flows through bedrock fractures. Depending on bedrock formations, a more distant well may be adversely affected by pumping even though a sentinel well shows no unusual activity. What can be done to make sure this does not happen?

Whom do we notify if we suspect that the pumping is affecting our water supply? Is a procedure in place?
Dave Rosoff said that he should be notified immediately. The High Falls Water Coalition suggested calling everyone on the contact list. There should be a clear, published procedure.

What remedial measures is the EPA prepared to take if residential wells are pumped dry by this

process?
Dave Rosoff indicated several possible measures:
1. Reduce the rate of pumping and/or interrupt the pumping to raise the water table.
2. If possible, set the pump at a deeper level in the affected well.
3. Drill a deeper well.

Who decides what measures will be taken? How is that decision reached? Will the EPA bear the costs for remedial action?

What impact will the sustained pumping have on the water table in the immediate vicinity of the MRIP?
The plan is to extract water from the aquifer at a rate of 40 to 80 gallons per minute on a continuous basis. This far exceeds the current daily water usage of the entire affected area:

Average U.S. per capita water usage (*Encyclopedia Britannica*):	100 gal/day
Approximate Households in Affected Area:	150
Estimated High Falls Daily Usage:	15,000 gal/day

Low-level Treatment Usage:	57,600 gal/day
High-level Treatment Usage:	115,200 gal/day

In other words, the plan is to extract 4 to 8 times more water per day than the entire affected population uses on a daily basis. This means that within the next few weeks the 10 residential wells in the immediate vicinity of the MRIP will suddenly have an experience as if their water table were being shared by 550 to 1100 other households. Is this sustainable? For what period of time? What effect will the more aggressive phase of treatment, GR3 - the treatment of the farfield plume, have on these wells?

We have additional concerns regarding the longer range proposals, GR3 and AWS3, which involve the formation of a High Falls Water District to permit the more aggressive treatment of the aquifer beneath the entire hamlet.

At the urging of the EPA, the town governments of Marbletown and Rosendale are drafting a very detailed "Map Plan and Report" to establish the governmental taxing authority to form and control the water district. However, the EPA has not yet determined the backup water source which will be required by the water district when the Catskill Aqueduct periodically goes out of service. The location of the backup water source will have a profound impact on the boundaries of the district. The water source must be in an uncontaminated area of the hamlet and its operation could have an adverse impact on residential wells that are not currently within the proposed boundaries. The EPA should complete all aspects of the design that have an impact on the water district boundaries so that the town residents and governments can make informed, intelligent decisions. This is especially important given the current plans by the town governments for mandatory connection to the water system and the forced abandonment of wells.

Thank you for this opportunity to respond to the Proposed Remedial Action Plan.

Yours truly,

cc. Kevin Cahill, Assemblyman 101st District, State of New York
Maurice Hinchey, Congressman 26th Congressional District of New York, House of Representatives
Tom Jackson, Town Supervisor, Town of Marbletown
Gretchen Reed, President, High Falls Water Coalition
Dave Rosoff, On-Scene Coordinator, EPA

TOWN OF MARBLETOWN

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JUSTICE 687-1328
HIGHWAY 687-9615
BUILDING 687-7500
PLANNING /ZONING 687-7500
ASSESSOR 687-9523
YOUTH /RECREATION 687-0800
TAX COLLECTOR 687-7601
FAX 914-687-9068

February 14, 2000

VIA FAX: (212) 637-3966

Mr. Pat Hamblin, Project Manager
Emergency & Remedial Response Division
290 Broadway, 20th Floor
New York, NY 10007-1866

Re: Mohonk Road Industrial Plant Site

Dear Pat:

Please accept this letter as additional written comment on the proposed Remedial Action Plan for the Mohonk Road Industrial Plant Superfund site.

The Marbletown Town Board formally requests that the boundaries of the proposed High Falls Water District be amended to include the properties along Berme and Canal Roads and in proximity to the intersection of said roads, as discussed at the joint Town Board meeting on January 27.

Based on discussions with our engineering and legal consultants, we believe it would be in the best interest of the residents in this area to be included in the Water District because of its near proximity to the contamination plume, and because of the possibility that the plume could expand to contaminate their wells.

Very truly yours,

Thomas H. Jackson, Jr.
Supervisor

THJ:ch

cc: Marbletown Town Board
Gretchen Reed, President - High Falls Water Coalition
Dennis Larios, P.E.
Lewis C. Di Stasi, Jr., Esq.

JAMES AND SHAREN EATON
17 OLD ROUTE 213
HIGH FALLS, NY 12440
(914) 687-4960
(914) 256-2005 (WORK)

February 15, 2000

Mr. Patrick Hamblin
Remedial Project Manager
EPA
FAX NO. 212-637-3966

RE: Mohonk Road Industrial Plant Superfund Site

Dear Mr. Hamblin:

On behalf of my family, I would like to thank you and the EPA for the opportunity to make comments on the Proposed Remedial Action Plan and the proposed High Falls Water District. After attending a resident's forum in late January, my husband and I came away with the following concerns:

1. The map of the water district at that time included a street called "Fourth Street" which no longer exists. It is our understanding that Fourth Street at one time ran right through what is currently our front yard and the vacant lot next to us. Gravel Road also was not properly located on the map and seemed to be located where Old Route 213 is, in fact, located. My guess is by now these inaccuracies have been addressed but if not, we would ask that they be looked into.

2. That the water plant be large enough to account for any residents who may need to tie in to city water once the pumping of the groundwater commences. We are also concerned that the system be large enough to take into consideration any currently undeveloped land which may need to tie in to city water should it be purchased and built upon.

3. That the backup source of water be sufficient enough to be used as the primary source of water should New York City decide to raise the rate of the aqueduct water to an unacceptable rate.

4. We are also concerned about the location of the off-site pumping wells. We purchased our property in part because of its location and view. The lot next to us, although not owned by us, is vacant. If it were to be used as an off-site pumping location, we wonder what the impact would be to the natural beauty of the land.

Again I would like to express our thanks for the EPA's consideration of our comments. The amount of time, effort and expense that the agency is putting forth is appreciated.

Very truly yours,

Sharen Eaton

Sharen Eaton
High Falls Resident

High Falls Water Coalition, Inc.
P.O. Box 44
High Falls, NY 12440

Mr. Patrick Hamblin
Remedial Project Manager
EPA
290 Broadway, 20th Floor
New York, New York 10007-1866

February 8, 2000

SUBJECT: COMMENTS ON MRIP PRAP

As we discussed, attached please find comments from the High Falls Water Coalition and our technical advisors on the Mohonk Road Industrial Plant Site Proposed Remedial Action Plan.

These comments reflect questions and concerns expressed to the Coalition by our Trustees, other local residents, and our technical advisors. As you know, on February 1, 2000, the Coalition held a Residents' Forum meeting at which thirty local citizens discussed the many important issues surrounding the EPA's proposed alternate water supply and removal actions. Additionally, the Coalition has received many phone calls regarding site activities and the proposed alternate water supply. A compilation of issues raised by local residents is attached.

Also attached are comments from our technical advisors Rhode, Soyka & Andrews and Leggette, Brashears & Graham. RSA's comments focus mainly on engineering and design issues, while LBG's comments center on ground-water and environmental issues.

While many residents support the EPA's clean up efforts and the selected public water supply alternative, serious questions remain about some of the details of these plans.

We recognize that some of these issues involve not only the EPA, but also the proposed High Falls Water District that is under consideration by the Towns of Marbletown and Rosendale. Consequently, we are also forwarding this material to the respective Town Supervisors.

We appreciate the EPA's continued sensitivity to the local residents during this difficult process. We look forward to working with you to address these important questions and concerns, and to reach a mutually satisfactory conclusion.

GRETCHEN REED
President, High Falls Water Coalition

Cc: Mr. Tom Jackson, Marbletown Town Supervisor
Ms. Jeannie Fleming-Laik, Rosendale Town Supervisor
Mr. John Andrews, Rhode, Soyka & Andrews

RESIDENT COMMENTS ON
THE MOHONK ROAD INDUSTRIAL PLANT SITE
PROPOSED REMEDIAL ACTION PLAN

• Alternate Water Supply - many residents support the creation of a public water supply using the Catskill Aqueduct as the best alternative for providing safe drinking water and allowing EPA to perform their groundwater clean up activities. However, serious questions remain about some of the details of these plans.

• Water District Boundary - there is concern regarding the establishment of the boundary for the proposed alternate water supply. Recent sampling has indicated possible contamination of areas outside the proposed alternate water supply area. It appears that additional testing may be warranted to make certain that all potentially affected properties are included.

• District Extension - related to the boundary issue, there is concern about the mechanism for extending the water district should additional properties become contaminated or lose their wells due to draw down or other EPA-related activities. The public water supply system would need to be able to handle these additional properties.

• Back Up Water Supply - there are serious questions regarding the back up water supply that would be required for the proposed water district. A number of residents have expressed strong opposition to the use of local creek water from the Rondout or Coxingkill. The question of using treated water from the Site has been raised. Residents want to have more detailed information on the nature of the back up supply, and be assured of its sufficiency.

• Mandatory Connection of Properties - some residents are concerned about the possibility of a mandatory hook up requirement, especially for those residents with currently uncontaminated wells.

• Disconnection of Wells - a number of residents have expressed the desire to maintain their wells for outdoor use.

• Sufficiency of Monitoring of Treated Water - there is concern about the frequency and accuracy of monitoring of the treated contaminated water.

• Ongoing Testing and Monitoring of Wells - there is a question regarding the ongoing monitoring of wells, especially on the perimeter of the district. Who will be responsible for this monitoring, and for what time period?

• Treatment of Drinking Water - the community wants more specifics about the type of treatment and treatment facility which will be used for the public water supply.

• Historic District Issues - much of the proposed alternate water supply district is also a designated National Historic District, and many of the homes are historically significant. In addition, there are a number of important artifacts of the D&H Canal, including the Five Locks Walk, a National Historic Landmark. Residents want assurance that EPA acknowledges and will protect these important resources.

• Vacant Property - there is concern about the impact of possible development on the district, and the district's ability to handle such development.

• Construction Issues - there are a number of concerns surrounding the actual construction of the public water supply. First and foremost is the potential for damage to residents' homes, followed by the disruption of roads during the construction. This disruption could have a significant impact on local businesses.

• Selection of Contractors - related to the item above, residents are concerned that the contractors selected for both the removal action and alternate water supply project not be just "low bidders."

• Location of Additional Treatment Pumps - residents are concerned about the possible placement of additional treatment pumps and/or facilities off the site. EPA has not specified the exact number nor the proposed locations of these pumps.

ROHDE, SOYKA
& ANDREWS
Consulting Engineers, P.C.

40 Garden Street
Poughkeepsie, NY 12601
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Wilfred A. Rohde, P.E • Michael W. Soyka, P.E • John V. Andrews, Jr., P.E.

February 11, 2000

VIA E-MAIL
HARD COPY U.S. MAIL

Gretchen Reed, President
High Falls Water Coalition, Inc.
PO Box 44
High Falls, NY 12440

RE: **PROPOSED REMEDIAL ACTION PLAN**
MOHONK ROAD INDUSTRIAL PLANT SITE
HAMLET OF HIGH FALLS, ULSTER COUNTY, NEW YORK
SITE NUMBER 3-56-023
DATED: NOVEMBER 1999

Dear Ms. Reed:

We have reviewed the Proposed Remedial Action Plan (PRAP) for the Mohonk Road Industrial Plant Site (MRIP) dated November 1999 as prepared by the New York State Department of Environment Conservation (NYSDEC) – Division of Environmental Remediation. The comments contained herein are offered to the High Falls Water Coalition for their consideration. By copy of this letter, these comments are also being submitted to Patrick Hamblin, Project Manager, EPA as formal written comments on the PRAP.

The remedial action plan is summarized as follows:

- Construction of a new public water system to supply clean and safe potable water in the Hamlet of High Falls, portions being in both the Town of Marbletown and the Town of Rosendale for residents with impacted or threatened private water supply wells.
- Continuation of the monitoring and maintenance of individual granular activated carbon filtration systems until the water supply is fully operational.
- Completion and continued operation of the on-site extraction and treatment system for contaminated bedrock groundwater.
- Excavation and off-site disposal of contaminated subsurface soils on the MRIP property.
- Capture and treatment of contaminated groundwater off the MRIP site.
- Long term groundwater monitoring.

The key component of the PRAP is the provision of a reliable alternative potable water supply system for residences with impacted or threatened private water supply wells. This proposed remedy is contingent upon the creation of a municipal water district covering portions of the Towns of Marbletown and Rosendale under New York State Town Law. Without the alternative public water supply source, other key elements are likely to break down and fail to meet the overall objectives of the remediation action.

Based on our review of the PRAP, the following comments are offered for your consideration:

1. POTABLE WATER SUPPLY ALTERNATIVES

A. The selected remedy involves the creation of a municipal water district. The primary water supply for the new district will be a connection to the Catskill Aqueduct under the terms and conditions of an agreement with the New York City Department of Environmental Protection. Neither the municipal water district nor the agreement with the New York City Department of Environmental Protection have yet been completed. The district formation process is currently underway involving both Towns. An initial public information meeting has been held at which time the preliminary Map, Plan and Report required by Town Law for district formation was presented. Attached hereto and fully incorporated herein is a copy of our memo to you dated January 27, 2000 which outlines general questions or issues that must be addressed during the district formation process. These same comments are applicable to the PRAP.

B. The Catskill Aqueduct is the proposed primary source of water. A backup water supply is required for those periods when the aqueduct is temporarily out of service. The PRAP considers either use of the Rondout Creek or bedrock supply wells as the backup source. For the purposes of cost evaluation, the bedrock well was identified as the backup supply.

- The Catskill Aqueduct was chosen as the preferred alternative as it was considered to be the most reliable source of potable water over the long term. The Catskill Aqueduct does have a history of service interruptions and temporary removals from service. The backup supply is therefore a key element. The PRAP identifies a backup water supply for a minimum period of five (5) days. We believe such a design to be narrow and possibly inadequate over the long run. We do not consider the Rondout Creek to be a long-term reliable backup due to water quality concerns, drought restrictions and the variation in possible treatment for creek water versus aqueduct water. We believe the most appropriate backup water supply to be bedrock wells.

- The PRAP states that under the contaminated bedrock aquifer response alternative, both off-site and on-site pumping is necessary. Groundwater extraction at high pumping rates may result in variations in groundwater levels within the bedrock aquifer. Any bedrock well selected for a backup supply must be remote from and not impacted by the local aquifer. The PRAP has suggested that identification of the alternate supply and the groundwater extraction rates be determined during the remedial design phase. It would appear that final selection, rating and capacity of the backup water supply must be coordinated with the proposed extraction system. We believe that the extraction system must be in and operating with a reasonable performance history prior to final siting, rating and capacity establishment of the backup supply.

- Certain residents have questioned the potential use of the treated water from the groundwater treatment systems as the backup supply for the potable water system. The water will be treated and discharged to surface water bodies at different quality standards than are appropriate for drinking water supplies. We do not believe that the discharge from the remediation systems provides an acceptable backup supply, however, in the long-term, when, if or as groundwater conditions improve, consideration should be given to possible use of this water as back up water. The design and implementation of the discharge piping should not preclude such a future use.

C. The issue of vacant land within the public water supply service area and immediately adjacent to the public water supply service area is only vaguely addressed. Sufficient water source capacity should be developed to support reasonable growth within vacant areas. Development outside the public water supply service area, which may require the use of private wells, should be addressed in the long-term institutional controls developed for the overall remediation plan. Additionally, there could be a minimum three-year window before the water system is fully operational. The institutional controls should address interim development of the vacant parcels within the public water supply service area, particularly the analysis, assessment and possible permitting of private water systems for the vacant lands.

2. CONTAMINATED BEDROCK AQUIFER RESPONSE ALTERNATIVE

A. The selected alternative involves active remediation of contaminated water via extraction and treatment site wide. This includes both the on-site treatment system currently being completed and placed into operation and a similar system or systems off the MRIP property. The details of off-site placement, appearance and discharge are not fully developed in the PRAP. Preliminary thresholds identifying appropriate locations for placement of the extraction facilities, the appearance of the extraction and treatment facilities and the proposed discharge routes should be addressed at this time.

B. The groundwater response alternatives include, as necessary components, institutional controls and long-term monitoring. The PRAP fails to fully define and establish responsibility for the financial and oversight responsibilities related to the institutional contracts or long-term monitoring. The PRAP also fails to define continued use of impacted or threatened wells by residents for other than drinking water purposes. Abandonment of existing private water supply wells is not addressed in the PRAP. Consideration should be given at this time to developing the necessary criteria for abandonment, the timing of abandonment and the logistics of abandonment, given the wide variety of types, locations and depths of the private water supply wells.

- Our January 27, 2000 memo contains comments relative to the establishment of the boundaries of the public water supply service area. This boundary has been somewhat of a moving target and continues to be a moving target. Implementation of the remedies identified in the PRAP may further serve to move the public water supply boundary. It seems appropriate that an additional area, outside the defined public water supply service area, be identified and baseline data developed for properties included in that area, specifically covering water quality and well depth. This baseline data should further include both the Rondout Creek and the Coxing Kill.

> ➢ The groundwater response alternative clearly establishes a connection between overall groundwater levels in the bedrock aquifer and the proposed extraction and treatment. The properties contained within the public water supply service area have been selected based, in part, on the projected impacts of the extraction rates on the aquifer. The PRAP should establish an appropriate methodology to respond to possible out of area well impacts, to investigate and evaluate these impacts, and to mitigate impacts to private water supply wells. Any such methodology must include appropriate financial provisions related to connection to the public water supply and other similar costs.

3. GENERAL COMMENTS

A. The proposed remedial action plan relies heavily on the formation of a municipal water district. The municipal water district formation is the subject of specific policies, procedures and requirements as outlined in State Law. The current approach of the involved Town Boards includes the potential for a mandatory referendum on district formation. The proposed remedial action plan breaks down if the municipal district is not formed. The proposed remedial action plan insufficiently details the responsibilities that will ultimately be transferred to the district and further, fails to identify the costs related thereto. To ensure public participation and success of any referendum, full and complete details of all required district activities and costs should be developed now.

B. The proposed remedial action plan has identified an entire set of significant details to be addressed during the remedial design phase. The document is silent, however, on the manner and method by which the proposed remedial action plan is to be or can be modified based on data generated during the remedial design phase. The procedure for identifying a variation, communicating it to the public and charting a new course should be defined and outlined at this stage.

We trust the comments contained herein satisfy your requirements. If we can be of additional assistance, please advise.

Yours very truly,

ROHDE, SOYKA & ANDREWS
CONSULTING ENGINEERS, P.C.

John V. Andrews, Jr., P.E.

Enclosure

cc: Patrick Hamblin, Project Manager, EPA via Federal Express & E-Mail
Karen DeStefanis, LBG

ROHDE, SOYKA
& ANDREWS
Consulting Engineers, P.C.

40 Garden Street
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Phone: (914) 452-7515 Fax: (914) 452-8335
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Wilfred A. Rohde, P.E • Michael W. Soyka, P.E • John V. Andrews, Jr., P.E.

MEMORANDUM

Via E-Mail – Hard Copy U.S. Mail

TO: Gretchen Reed – High Falls Water Coalition

FROM: John V. Andrews, Jr., P.E.

PROJECT: HIGH FALLS WATER COALITION TECHNICAL ADVISOR

SUBJECT: District Formation Issues

JOB NO.: 99-335-01

DATE: January 27, 2000

Pursuant to your request, we have developed the following list of questions/issues to be reviewed with the involved Town Boards and their consultants concerning district formation. We have not been provided with a copy of the preliminary Map, Plan and Report (MP&R) or the draft inter-municipal agreement. As a consequence, some of the questions and/or issues framed herein may already be addressed in the documents.

1. In general terms, a public information meeting on a MP&R usually occurs at such time as it is possible to identify exactly who will be included in the proposed district and the approximate costs related thereto. Formation of a district at this time would appear to be premature considering the requirements imposed by Town Law related to district formation.

   The agencies are currently accepting public comment on the Proposed Remedial Action Plan (PRAP). At the close of public comment, the agencies will move toward a Record of Decision (ROD). Upon signing of the ROD, the project will proceed into the remedial design phase. Ideally, the MP&R should be prepared following the ROD and nearing the end of the remedial design phase.

2. The district boundary has been established based on the best available information accumulated to date. Recent sampling has indicated possible involved areas outside the previously delineated public water supply service area. The PRAP clearly indicates that implementation of the recommended groundwater treatment alternative may result in changes to groundwater conditions which may impact existing or proposed well sources and as a consequence recommends that implementation of the groundwater treatment alternative only occur if there is a alternative public water supply. It is possible, particularly based on the recent sampling, if upheld, that the limits of the public water supply service area may need to be expanded. This suggests that finalization of the MP&R should be delayed until all evaluations have been completed or that the MP&R specifically include procedures for the expansion and inclusion of other potentially impacted properties.

3. District formation requires that the municipalities fully comply with the State Environmental Quality Review Act (SEQRA). This action also involves a federal agency. That agency must comply with the National Environmental Policy Act. No involved agencies under SEQRA can fund, undertake or approve an action until the federal environmental review process has been completed and appropriate findings issued. The status and timeframes associated with the federal review need to be determined and factored into the municipality's SEQRA requirements.

4. The proposed district involves properties located within two (2) separate and distinct municipal entities, the Town of Marbletown and the Town of Rosendale. To implement the district as currently contemplated, an overall inter-municipal agreement is necessary.

   ? Does implementation of the district, as contemplated, require that separately formed individual districts, one in each community, be created first, thereby necessitating parallel, lock step district formation paths.

   ? If this is the case, two (2) actions, one by each Town Board, will be required at each step of the district formation process. The impact of the joint effort will most likely occur at the time of a referendum. If separate referendums are required, it may skew the vote and therefore, the outcome. A failure of the referendum in one community may significantly impact the ultimate arrangement.

   ? Details of exactly how the inter-municipal agreement will function need to be provided. Typically, inter-municipal agreements involve creation of an independent board to oversee the joint entity. Any such board should include representatives from the area being serviced. The agreement should also fully spell out responsibilities, funding and assessments within each community.

5. No clear indication of the costs to be absorbed by the district has been established. In addition, any costs that have been provided lack detail in defining how such costs were developed. The PRAP identifies a wide variety of future ongoing costs. The PRAP does not clearly establish who will be responsible for such costs. The MP&R must clearly define district responsibilities, identify the costs related thereto and include those costs in the district budget as appropriate.

   The respective Town budgets will need to reimbursed for the costs related to the preparation of the MP&R upon completion of the district formation process. Other than the reimbursement of these costs, it appears as though all other capital costs, i.e. those costs related to construction of the proposed facilities and connection of the individual homes, will be the responsibility of the EPA/DEC. This needs to be clarified and definitively confirmed in the MP&R.

   Depending upon the total cost to the typical property, exclusive of hook-up fees, and the need for the individual Towns to incur debt related to the district formation process, approval of the State Comptroller may be necessary for completion of the district formation process. Timeframes for this approval must be adequately accounted for the in the overall project timeframe.

6. The actual timeframe for district costs to kick in must be clearly identified. The record appears to suggest that two (2) years is allocated for design and construction, potentially one (1) year for shake down of the facility, with turnover of the completed facility to the district for full operation and maintenance a minimum of three (3) years out. All costs incurred during that period must be clearly accounted for and if any are the responsibility of the district, they need to be included in the MP&R.

7. The record is unclear as to what role the district will play in the design and construction of the proposed facilities. Obviously, since the district will ultimately be responsible for long term operation and maintenance of the facility, the district should have a clearly defined role in the remedial design phase with full ability to comment on design issues and cost allocations. District

participation in the remedial design phase will need to be funded. The arrangements for such funding should be clearly indicated in the MP&R.

8. Final resolution adopted by the respective Town Boards must include the following:

   A A determination by the Town Board that the Notice of Hearing was properly posted and published;

   B A determination that all property and property owners within the proposed district are benefited;

   C A determination that all property and property owners which will be benefited by the district are included within the boundaries of the district; and

   D A determination that the establishment of the proposed district will be in the public's interest.

   It does not appear, from the information available to us at this time, that all such determinations can be made by the respective Town Boards.

9. District formation is normally subject permissive referendum. If the respective Town Board's intent is a mandatory referendum, the resolution approving the creation of the proposed district must contain language identifying the requirements for this referendum and a true and correct copy of the resolution as approved and adopted posted in the Town's newspaper. The timeframes for the conduct of such a referendum must be factored into the process, particularly if EPA has no intent on signing the ROD until such time as the district formation process has been competed.

10. No clear cut decision has been made on mandatory connection of all properties located within the proposed district. The respective Town Boards should address this issue now and the MP&R should include appropriate language covering connection policies and procedures. Further, no clear cut determination has been made relative to allowing homeowners to maintain their existing wells for irrigation purposes. If individual wells are permitted to be retained, it may impact future district costs as the New York State Department of Health (NYSDOH) may require regular inspections in order to ensure that a potential cross connection between the private and public source does not occur.

We trust the comments contained herein satisfy your requirements. If we can be of additional assistance, please advise. Once we are provided with hard copies of the various documents, we would be in a position to more appropriately frame our comments and/or questions. The real issue remains the fact that this is still somewhat of a moving target which is not contemplated by or easily handled in the district formation process.

John V. Andrews, Jr., P.E.

cc: Karen Destefanis, LBG (hard copy only)

LEGGETTE, BRASHEARS & GRAHAM, INC.

PROFESSIONAL GROUND-WATER AND
ENVIRONMENTAL ENGINEERING SERVICES

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February 7, 2000

Ms. Gretchen Reed
High Falls Water Coalition, Inc.
P.O. Box 44
High Falls, NY 12440

Dear Ms. Reed

At the request of the High Falls Coalition, Leggette, Brashears & Graham, Inc. (LBG) have reviewed the 1998-1999 Remedial Investigation/Feasibility Study (RI/FS) prepared by Lawler, Matusky & Skelly (LMS) and the Proposed Remedial Action Plan (PRAP) prepared by the New York State Department of Environmental Conservation (NYSDEC) for the Mohonk Road Industrial Plant Site located in High Falls, New York. We have provided a brief summary regarding the documents reviewed and conclude with our comments related to the PRAP.

BACKGROUND

Site History

The Mohonk Road Industrial Plant is a 14.5-acre property located outside of the Hamlet of High Falls, Ulster County, New York. The property is located in a residential area and is undeveloped with the exception of a 43,000 ft^2 building located in the southern corner of the site. The building was originally built in the early 1940's and used as a chicken coop. In the early 1960's the building was converted to a manufacturing facility that was occupied by various companies until 1992 when the property was repossessed by the Banco Popular of Puerto Rico. A year later the property was sold and sublet to various businesses. Between 1960 and 1992 solvents were reportedly used at the site for cleaning and finishing metal parts

In 1994, the New York State Department of Health (NYSDOH) tested the ground water from a private well in response to a resident's concern. A variety of volatile organic compounds (VOCs) were detected in the well water. These VOCs included 1,1,1-trichloroethane (1,1,1-TCA) as the primary contaminant with lower concentrations of trichloroethylene (TCE), 1,1-

dichlorotheylene (1,1-DCE) and 1,1-dichloroethane (1,1-DCA). Over 100 private water supplies in the area were tested and ground water from 70 private supply wells is currently treated by granular activated carbon (GAC) filtration systems. The filtration systems were installed, maintained and monitored by the NYSDEC. The NYSDEC has identified the Mohonk Road Industrial Plant as the source of the contamination and designated it as a Class 2 site on the New York State Registry of Inactive Hazardous Waste Sites. This classification indicates that the site poses a significant threat to public health and the environment. Based on the results of the environmental investigations that have been conducted, the site was included on the Federal National Priorities List on January 19, 1999. As a result of this listing, the United States Environmental Protection Agency (EPA) is the lead agency for the project.

Summary of Remedial Investigation/Feasibility Study

Various investigations have been conducted at the site beginning in 1992. After ground-water contamination was discovered in private offsite potable supply wells, additional investigations were conducted by the NYSDEC (1995) and subsequently the NYSDEC subcontractor LMS. Between 1996 and 1998, LMS installed monitor wells at varying depths in the overburden material and in the bedrock both on and off the property; collected soil gas samples; sludge samples; soil samples; surface-water samples; ground-water samples (on and offsite monitoring wells and private potable supply wells); traced septic piping and other drains exiting the building; dug test pits in suspect areas; and conducted pumping tests on two bedrock wells to determine aquifer characteristics of the area.

In the fall of 1997 a 1,000-gallon underground storage tank (UST) located north of the building was excavated and removed from the site. This tank was assumed to be a source of the contaminants found in the ground water because sludge samples from the tank contained high concentrations of 1,1,1-TCA (26%). Corrosion and numerous holes were observed on the bottom of the tank, supporting the theory that this tank contributed to the ground-water contamination. Although 25 tons of contaminated soil from below the tank was excavated and disposed of off site, reported concentrations of VOCs in the soils were above the cleanup levels but were not hazardous.

The results of the soil investigations identified several source areas on the property. These areas include the soils located on the west side of the building (Area 1), limited soil underneath the building (Area D-1), soils in the vicinity of the junction box on the west side of the building (Area D-2) and soils to the north of the building in the vicinity of the 1,000-gallon UST that was removed in 1997. Based on the RI, these areas encompass approximately 9,018 ft^3 or 334 yd^3 of soil contaminated with VOCs above the cleanup criteria.

The results of the ground-water investigations identified a VOC plume consisting primarily of 1,1,1-TCA, 1,1-DCE, TCE and 1,1-DCA (found offsite only). The VOCs have been identified in the onsite overburden aquifer and the onsite and offsite bedrock aquifer. The total area of the 1998 bedrock plume with VOC concentrations exceeding 10 $\mu g/l$ (micrograms per liter) includes approximately 170 acres (approximately 6.3 acres "near field" with concentrations greater than 1,000$\mu g/l$). This plume extends approximately 4,000 feet from the site, from the Catskill Aqueduct located approximately 700 feet southwest of the site to north of the juncture of Route 213 and Mohonk Road. A volume of 1,100 million gallons of contaminated ground water was estimated in the RI.

The surface water sampled from five offsite locations indicated that VOCs are not present with the exception of one location. This sample was obtained from a shallow cistern located downgradient of the site. The source of the contamination is attributed to the contaminated overburden material from the site. The four remaining surface water sampling locations did not contain VOCs.

Based on the various investigations conducted on the site, several remedial alternatives were reviewed and presented in the March 1999 Feasibility Study (FS). These alternatives specifically address options for developing alternative water supplies to the affected area, means of addressing the onsite contaminated soils that act as a continuing source of ground-water contamination and remediation of both the onsite and offsite contaminated ground water in the bedrock. In an effort to aid and narrow the remedial alternatives evaluation, a ground-water flow model was developed. This model was used to predict the potential flow of contaminated ground water under the various proposed alternatives and the potential impact to the private water supplies and surface water bodies in the area.

PROPOSED REMEDY

Proposed Remedial Action Plan (PRAP)

The PRAP for the site was submitted by the NYSDEC in November 1999. The PRAP presents the viable alternatives that were presented in the FS to remediate the site and the surrounding area. As part of the PRAP, the FS alternatives were reviewed and narrowed further based on several factors including: providing protection of human health and the environment, maintaining cost-effectiveness, achieving compliance with statutory laws and, providing permanent solutions. The options presented in the PRAP to address the need for a potable water supply include: AWS-1) No Further Action, AWS-2) Installation and Maintenance of Additional GAC Filter Systems, AWS-3) Public Water Supply Using the Catskill Aqueduct, and AWS-4) Public Water Supply Using a Well Field. The options to address the contaminated bedrock aquifer alternatives include: GR-1) No Further Action, GR-2) Continuation of Non-Time Critical Removal Action (pump and treat site ground water for the next 30 years) and, GR-3) Extraction and Ex-Situ Treatment (pump and treat on and offsite contaminated ground water). The options to address contaminated subsurface soils identified on the property include SC-1) No Further Action, SC-2) Excavation and Ex-Situ Treatment Performed at the Site and, SC-3) Excavation and Offsite Disposal.

The preferred remedy presented in the PRAP includes: construction of a new public water supply system through connection with the Catskill Aqueduct (AWS 3); operation of onsite and offsite extraction and treatment systems for bedrock contaminated ground water (GR-3); and excavation and offsite disposal of contaminated soil identified on the property (SC-3).

COMMENTS

After reviewing the RI/FS and PRAP, there are several items that warrant further clarification from the agencies. These items have been presented as they relate to the proposed selected remedy.

AWS-3 Public Water Supply Using Catskill Aqueduct

Review of the available information indicates that this alternative is likely the best solution for the area. Utilizing the Catskill Aqueduct would provide a reliable source of contaminant-free water. This alternative would also allow remediation of the ground water in the bedrock aquifer that will likely impact several private water supplies. In addition, connection with the Catskill Aqueduct could allow for future growth of the High Falls community. However, several points were brought up under this alternative that warrant comment.

1. As specified in the PRAP, a backup supply of water will be required for periods when the Aqueduct is temporarily taken out of service. The PRAP considers the Rondout Creek or a bedrock supply well. Because of poor water quality, potential pollution and variation in flow (flow during summer and drought conditions will likely be insufficient), we do not believe the Rondout is a reliable source for a backup water supply.

2. A possible backup supply well MRMW-13B, located on Canal Road approximately 2,100 feet northwest of the site, has been described as an artesian well yielding between 100 and 150gpm. Water-quality testing has indicated that this well does not contain VOC contamination. Because of the artesian nature and present water quality, this well is a good candidate as a potential backup well. However, as part of the selected remedy, offsite remediation through pumping will be implemented. It will be critical to determine if the offsite pumping will impact the pumping yield of the backup supply well. In addition, the backup well should be pumped at the projected rates over a significant period of time to determine if the pumping will draw contaminants to the well.

3. The PRAP indicates that in order to utilize the Catskill Aqueduct, a community water district will have to be established. The boundary of this water district has been defined based on historic water quality of affected wells. The information provided in the RI does not give a clear indication that the vertical extent of the contamination has been fully defined. Information regarding the elevations of each well (monitor and private wells) in relationship to

the site were not provided in the documents that were reviewed. In addition, it is not clear from the documents if all of the private water supplies that could potentially be impacted have been sampled. As a result, there could be private water supplies that are completed at deeper intervals located beyond the proposed boundary which could potentially be affected by the ground-water plume. The preliminary 1999 ground-water results support this concern.

<u>GR-3 Remediation of Onsite and Offsite Bedrock Aquifer</u>

Review of the available information indicates that this alternative is the best solution. This is the only alternative that was provided that will attempt to restore the near and far field contaminated bedrock aquifer to drinking water standards. Currently the EPA has initiated operations of the onsite remediation system by installing two ground-water recovery wells located on the site (near field). These wells are designed to pump a combined total of 40 gpm. The extracted ground water will be treated by air stripping and then discharged offsite into the Coxing Kill. In addition to the onsite remediation system, the EPA proposes installing additional bedrock wells (three to six) offsite (far field) to prevent further plume migration. The ground water would be treated to remove VOCs to achieve New York State surface water discharge requirements prior to discharge to the Rondout Creek. As part of this remedy, long-term ground-water monitoring would be conducted until contamination levels are below the remedial action limits for two consecutive years. However, several points were brought up under this alternative that warrant comment.

1. This remedy only addresses the underlying bedrock aquifer. As of 1998, water quality from the overburden Well MW-4 contained the highest VOC concentrations found in any ground water that has been tested (including both overburden and bedrock). The concentration of 1,1,1-TCA detected in this well was 15,000 $\mu g/l$ and total VOC concentrations detected in this well were approximately 20,000 $\mu g/l$. The RI indicates that onsite there is a strong downward gradient. Therefore, the overburden aquifer will continue to act as a source of contamination to the underlying bedrock aquifer. To achieve ground-water remediation in the bedrock, the onsite overburden contamination should be fully defined and remediated. Remediation could be

achieved by conventional extraction of the water or high vacuum extraction with treatment.

2. There is no indication in the RI or FS that the Rondout Creek or the Coxing Kill were ever sampled for VOCs. The ground-water contour maps presented in both documents show ground-water flow towards both surface water bodies (fig 5-7, 5-8 in the RI). We recommend that the surface water and sediment from Rondout Creek and Coxing Kill be included in the long-term monitoring program. In addition, if samples have not been obtained from these two surface-water bodies, we recommend that they be obtained prior to any offsite remediation activities to develop a background water and sediment quality database.

3. In a recent meeting (February 1, 2000), the Coalition questioned whether the onsite treated ground water that will be discharged to the Coxing Kill could be used as a backup water supply or an alternative water supply to the Catskill Aqueduct. At a minimum, the ground water will be treated to meet New York State surface water discharge requirements prior to discharge to the Coxing Kill. However, these requirements are not as stringent as the Drinking Water Standards. Therefore, we do not recommend this suggestion as a viable option unless additional treatment and daily water-quality monitoring of the extracted ground water was guaranteed.

4. As part of this proposed remedy, the EPA has committed to implementing a ground-water and surface-water monitoring program. We recommend that the monitoring locations included in the program be sampled quarterly prior to the system being implemented to develop a background water-quality database. In addition, if the system is going to be implemented prior to the formation of the water district, we recommend that water levels of homes that could be affected by the offsite pumping be monitored and the pumping rate of the offsite remediation system be adjusted to minimize any impact.

5. The selected remedy indicates that no new monitoring wells are proposed for the long-term monitoring program. Bedrock ground-water contour maps provided in the RI (fig 5-7

and 5-8) show upgradient Monitor Well MW-1B as potentially downgradient of the site. The ground-water flow model presented in the FS indicates that flow is to the north, northeast and northwest. Water quality in the various wells tested support this flow direction. It is not apparent in the RI that homes "upgradient" of the site have been tested. Communications with the EPA have indicated that the homes upgradient of the site have in fact been sampled and several homes are sampled quarterly to monitor that their water quality is not impacted. However, the overburden and bedrock cluster (MW-1 and MW-1B) appear to be completed above the contaminant plume. For example, the bedrock well MW-5R, which contains over 2,000 μg/l of total VOCs, was completed approximately 50 feet lower than the bedrock Well MW-1B. The RI indicates that several significant water bearing fractures were encountered in many of the bedrock monitor wells (including MW-5R) at depths greater than the "upgradient" bedrock well. Based on the onsite water-quality data, VOCs could potentially be found in the onsite overburden aquifer or in the deeper bedrock aquifer. Because ground-water flow through bedrock is complex by nature, it may be prudent to consider installing additional monitor wells located in the "upgradient" area for further vertical definition.

Additionally, shale was reported in the onsite bedrock Well MW-11C. This shale would have a significant influence in ground-water flow in the bedrock aquifer. The ground-water flow model presented in the FS is based on a continuous shale layer throughout the area. However, shale was not noted in the RI text for any of the other monitor wells with the exception of MW-11C. No geologic well logs were provided for this review. In addition, there were no geologic data related to private wells in the area. As a result, it is not clear if the vertical extent of the bedrock contamination has been fully defined. It may be prudent to consider installing additional monitor wells in the far field plume for better understanding of ground-water flow in the bedrock.

SC-3 Subsurface Contaminated Soils on the Property

Review of the available information indicates that this alternative is the best solution. This alternative is especially important because the source of continuing contamination to the ground water will be permanently removed. Because of the sporadic locations of the affected soils, excavation and offsite removal makes the most sense. However, several points were brought up under this alternative that warrant comment.

1. The PRAP states that contaminated soil would be stockpiled or placed in rolloff containers on the property. Although it was not indicated in the document, it is standard practice to stockpile and cover the soils on plastic sheeting to minimize any potential runoff from precipitation events. If soils are going to be placed in rolloff containers, these containers should be lined and the soils covered each night to minimize potential leaks.

2. Estimated volumes of contaminated soils requiring excavation that were presented in the RI and the FS were 9,018 ft^3 (334 yd^3). This estimate was based on four areas identified during the investigations which include: Area 1A, 1B and 1C (Area 1) located west of the building and including 3,510 ft^3 of affected soils; Area 2A and 2B (Area 2) located in the vicinity of the former underground tank and including 1,917 ft^3 of affected soils; Area D-1 located in an area underneath the building that has a volume of 216 ft^3; and Area D-2 around an area below the junction box located outside of the building with a volume of 3,375 ft^3. The PRAP indicates that only 200 yd^3 of soil will require excavation and offsite disposal from Areas 1A, 1B, 2B D-1 and D-2. There is no rationale explaining why excavation of affected soils from Areas 1C and 2A is not included in the final remedy.

3. The PRAP indicates that an additional disposal area was discovered on the site in which approximately 300 yd^3 of soil was contaminated with paint wastes. This area was identified by the EPA through a geophysical survey and test pits. Based on the recent discovery, the fact that only 25 tons of soils were removed from the 1,000-gallon UST source area and relatively minor soil contamination has been detected on the site to date, we recommend additional investigations such as a review of historical aerial photographs and/or conducting a site-wide geophysical survey to find other potential source areas.

Characterization of Ground-Water Flow

1. Ground-water contour maps were constructed for the bedrock aquifer using data collected on September 1997, December 1997 and May 1998. Ground-water flow is shown to migrate to the north, northwest and northeast of the site. Of the three contour maps, only the December 1997 map includes water elevations from residential Wells RW-U8, RW-U1 and RW-62. Water-level elevations from these wells suggest that ground water may also migrate to the south. More data should be collected to confirm that ground water within the bedrock only flows to the north, northwest and northeast.

2. Two pumping tests were completed to determine aquifer parameters within the bedrock aquifer. The results from the pumping tests show the dependence of ground-water responses to fractures within a generally competent bedrock system. For example, during the MRPW-2 pumping test, drawdowns at MRMW-5B and MRMW-11B were 0.31 foot and 2.13 feet, respectively. However, MRMW-11B is over twice the distance from the pumping well as MRMW-5B. The RI indicated that the cone of depression from the MRMW-11B pumping test was asymmetrical and showed strong bias toward larger drawdown south and west of the pumping well. The cone of depression from the MRPW-2 was noted to be symmetrical. Neither pumping test had sufficient coverage east of the site and, therefore, fractures and ground-water flow to the east has not been adequately studied. Further characterization of ground-water flow east of the site is recommended to determine the significance of impacts and remedial objectives in this region.

3. The RI presents two geologic cross sections for the study area. The first cross section identifies a thrust fault near the study area. The impacts of the fault on ground-water flow are not examined further in the RI. In addition, the RI does not indicate whether fracture traces utilizing aerial photographs were completed for the study area. Understanding the faults and fractures within the bedrock would create a better understanding of ground-water flow within the study area and it would provide important data for evaluating remedial alternatives for the region. It is recommended that a fracture trace be completed to further understand ground-water

flow characteristics for the region. In addition, packer tests should be completed in several offsite bedrock wells (MW-8B, MW-9B, MW-10B, MW-14B and MW-15B) to create a better understanding of vertical impacts within the bedrock aquifer. Finally, borehole geophysical techniques should be employed in each of the bedrock wells that were not tested during the RI (MW-1B, MW-5B, MW-5R, MW-6B, MW-7B, MW-7R, MW-11C and MW-15B) for further characterization of the bedrock fracture system.

4. During the drilling of MW-11C, shale was encountered at approximately 210 feet below grade. The extent of the shale was not investigated. The presence of MW-11C presents a pathway for contaminants to migrate to the shale layer. A packer test should be completed within the shale to determine the permeability of the shale and any contaminant impacts to the shale aquifer. The extent of the shale should be further described.

5. The FS indicates that Upper Silurian fractured shale, dolostone and limestone of the High Falls Formation exist in a thin section on the eastern edge of Roundout Creek. The interaction between the formations and ground-water flow along the contact should be considered during the offsite remediation design phase. Contacts between different formations may play a significant role in ground-water flow within the study region.

<u>Ground-Water Flow Model</u>

1. The numerical ground-water flow model MODFLOW is not intended to simulate ground-water flow within competent or fractured bedrock as identified within the subject region. Great care should be taken when evaluating the results from the model for a ground-water system which appears to be dominated by fracture flow as shown by the pumping test results. Contaminated ground water may migrate in the direction of fractures within the bedrock and not necessarily at right angles to water-elevation contours.

2. The model thickness is identified as 200 feet. The RI indicates that the base of the quartzite conglomerate (Shawangunk Formation) to be the Martinburg Shale. The model

thickness should correspond with this contact. If the shale identified at the base of MW-11C is determined to be continuous and impacted, a layer should be added to the model to describe flow within the shale.

3. The southern model boundary is simulated by a general head boundary. Many assumptions including water elevation were made at this contact. The close proximity of the southern general head boundary to the site, may influence the simulated ground-water contours during pumping simulations. The southern model limit should be expanded further south to avoid influencing ground-water orientation during pumping simulations.

Very truly yours,

LEGGETTE, BRASHEARS & GRAHAM, INC.

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