Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Cole-Zaiser Site
Amboy (T), Oswego County
Site Number 7-38-013

December 1998

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Cole-Zaiser Inactive Hazardous Waste Site

Town of Amboy, Oswego County, New York
Site No. 7-38-013

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Cole-Zaiser inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40 CFR 300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Cole-Zaiser Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health or the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Cole-Zaiser site and the criteria identified for evaluation of alternatives the NYSDEC has selected ex-situ soil vapor extraction to address subsurface soil contaminated with chlorinated solvents. The components of the remedy are as follows:

1. A remedial design program.

2. The installation of a replacement well for the impacted, off site residence.

3. The excavation of contaminated, subsurface soil in the former lagoon / bermed area. Soil will be treated by ex-situ soil vapor extraction until remedial goals are achieved. Soil will be backfilled on site. Following the removal of the contaminated soil, groundwater in the source area will be removed for appropriate treatment/disposal.

4. Deed restrictions will be placed on the Cole-Zaiser site and the adjacent property with an impacted well. These restrictions will prohibit certain activities within the zone of groundwater contamination.

5. A groundwater monitoring program will be implemented to determine when contaminants attenuate to below groundwater standards. The site will be periodically evaluated to determine whether a change in classification on the Registry of Inactive Hazardous Waste Disposal Sites is warranted.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

12-9-98
Date

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

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SECTION 1: SITE LOCATION AND DESCRIPTION

The Cole-Zaiser site is a former waste oil reclamation facility which operated from 1973 to 1977. The site consists of approximately 2½ acres of developed land on Little Pond Road, Amboy Township, Oswego County, New York. A 1974 Oswego County Tax Map indicates that the site is situated on a 16.62 acre parcel. The site is located in a highly forested, rural area used for agricultural and residential purposes. The western end of the site is near the crest of a knoll. A Class 2 NYSDEC Wetland (WM-13) is located approximately 550 feet east-southeast of the site. The northen site boundary is marked by Little Pond Road, across which lies a residential property and forested area. An unplanted field to the south is separated from the site by a line of small trees. Grass fields are located to the west and east. The site location is shown on Figure 1 and the site features are shown on Figure 2.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

Cole-Zaiser, Inc. operated a waste oil reclamation facility at the site, which treated waste oil collected from a number of industrial clients, including: Morse Chain Company (whose successor is Borg-Warner Automotive, Inc.), Xerox Corporation, Morton Salt Company, American Brass, Ithaca Gun Company, Rollway Bearing, and Crucible Steel. Some of the waste oil accepted by Cole-Zaiser Inc contained "trichlor," which is presumably a chlorinated solvent.

The reclamation of waste oil entailed a filtration and dehydration process. Solids were allowed to settle out, and the waste oil was then processed by thermal dehydration. The waste oil was processed in three 10,000-gallon tanks. Waste oil was separated from water by heating the oil with electric coils inside the tank. As a result of the heating process, water, water-soluble oil, and chlorinated solvents ("tri-chlor") would settle at the bottom of the tanks.

The hydrocarbon oil that was recovered from the process was filtered in the main building and then sold as a heating fuel supplement.

In general, contamination at the site seems to be a result of poor house keeping practices. There were several reports of a waste oil lagoon on site, which was reportedly located in the area of highest subsurface soil contamination. Mr. Cole, a former owner of Cole-Zaiser, Inc., stated that no lagoon existed, but that a soil berm was constructed to collect spilled oil. Mr. Cole also cited several spills. One of the historical spills cited was associated with a 5,000 gallon tank truck that was used to store liquids generated from the reclamation process. Located at or near the former lagoon area, the truck reportedly developed a leak producing a 300 foot long oil slick that ran down hill to the south and southeast. Available information also indicates that surficial soil in the vicinity of the former unloading area became stained as a result of miscellaneous oil releases during Cole-Zaiser operations. Mr. Cole stated that some tank clean out wastes (e.g. sludge) were disposed on the ground in this area. Finally, Mr. Cole stated that following a fire or explosion, when the site was operated by Mr. Uhl, reclamation activities ceased. It is unknown whether the explosion/fire resulted in any release of material.

2.2: Remedial History

April 1976: NYSDEC cited Cole-Zaiser for violating Section 27-0301 of the Environmental Conservation Law after noting that liquid wastes had been released to the soil.

December 1983: The Cole-Zaiser site was added to the New York State Registry of Inactive Hazardous Waste Disposal Sites as a Class 2a site. A Class 2a designation is a temporary classification assigned to sites with insufficient data for inclusion in any other classification.

May 1987: A sample was collected from the on site residential drinking well by the Oswego County Health Department. The solvent trichloroethene (TCE) was detected at a concentration of 2 ug/L. The drinking water standard for TCE is 5 ug/L.

June 1989: A Phase I investigation was conducted for the NYSDEC to determine whether or not the site posed a significant threat to human health or the environment. The report concluded that there was insufficient data to make a determination.

November 1990: The Oswego County Health Department again sampled the on site residential well. No contaminants were detected.

August 1992: The NYSDOH collected samples from the on site drinking water well and a down gradient off site residential well. Chlorinated solvents above drinking water standards were detected in the off site down gradient residential well. Bottled water was supplied to this off site residence from October 1992 to July 1994.

November 1992: A Phase II investigation conducted for the NYSDEC was completed. The report recommended the site be reclassified as a Class 2 site on the NYS Registry of Inactive Hazardous Waste Disposal Sites. A Class 2 designation indicates that the site presents a significant threat to public health or the environment and that action is required. This determination was based on additional groundwater and soil samples that were collected as part of the Phase II investigation.

January 1993: The site was reclassified to Class 2 on the NYS Registry of Inactive Hazardous Waste Disposal Sites based on the Phase II investigation results.

October 1993: The NYSDEC installed a granular activated carbon (GAC) filter on the impacted down gradient residential well. Samples were collected showing that contaminants were being effectively removed by the treatment system. This filter is currently being maintained by the NYSDEC.

May 1995: The NYSDEC and Borg-Warner Automotive, Inc. entered into Consent Order A7-0320-94-11. In this order, Borg-Warner committed to the completion of a Remedial Investigation and Feasibility Study (RI/FS).

March 1998: The Remedial Investigation (RI) was completed by Borg-Warner Automotive which defined the nature and extent of contamination at the site. The results of the RI are presented in Section 4.1.

August 1998: The Feasibility Study (FS) was completed by Borg-Warner Automotive which recommended a remedy to address contamination at the site. The results of the FS are presented in Section 7.

SECTION 3: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to human health and the environment posed by the presence of hazardous waste, Borg-Warner Automotive, Inc., the successor to Morse Chain and one of the PRPs at the site, has recently conducted a Remedial Investigation/Feasibility Study (RI/FS).

3.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

The RI had three phases of fieldwork. The first phase was conducted between June 1996 and July 1996, the second phase between January 1997 and February 1997, and the third phase between October 27 and October 29, 1997. A report entitled; *Remedial Investigation, Cole-Zaiser Site, Amboy, Site No. 7-38-013, March 3, 1998* has been prepared describing the field activities and findings of the RI in detail.

The RI included the following activities:

- Geophysical investigation involving a magnetic detection survey to evaluate potential presence of buried metallic objects (e.g. drums).
- Collection of Geoprobe® soil gas samples from 33 locations in the vicinity of suspected source areas.
- Collection of Geoprobe® groundwater samples to be used in conjunction with soil gas results to approximate extent of contamination.
- Installation of soil borings and excavation of test pits.

- Installation of shallow and deep groundwater monitoring wells.

- Sampling and analysis of monitoring wells and surface/subsurface soils.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance values (SCGs). Groundwater SCGs identified for the Cole-Zaiser site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. For soils, NYSDEC TAGM 4046 provides soil cleanup guidelines for the protection of groundwater, background conditions, and health based exposure scenarios. Guidance values for evaluating contamination in sediments are provided in the NYSDEC "Technical Guidance for Screening Contaminated Sediments."

Based on the Remedial Investigation results, in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in part per million (ppm) and parts per billion (ppb). For comparison purposes, where applicable, SCGs are provided for each medium.

3.1.1 Nature of Contamination:

Chlorinated solvents and their breakdown products represent the most prevalent organic groundwater contaminants in the country. These solvents have been used widely for degreasing engines, manufactured parts, electronic components, and clothing. Once dirty, chlorinated solvents have often been disposed of into refuse sites, waste pits and lagoons, and storage tanks. Because of their relative solubility in water and their somewhat poor sorption to soil, they tend to migrate downward through soil, contaminating groundwater with which they come into contact. Being denser than water, their downward movement is not impeded when they reach the water table, so they can penetrate deeply beneath the water table. Chlorinated solvents and petroleum products break down by physical, chemical, and biological processes in the environment. It is important to note that some break down products of chlorinated solvents are more toxic than their parent compounds (i.e.,: vinyl chloride produced by the breakdown of trichloroethene). Besides groundwater transport, chlorinated solvents are readily transported by volatilization.

As described in the RI Report, many soil gas, surface soil, sub-surface soil and groundwater samples were collected at the site to characterize the nature and extent of contamination. The main category of contaminants which exceed their SCGs are volatile organic compounds (VOCs). The compounds 1,1-dichloroethene (1,1-DCE); 1,2-dichloroethene (1,2-DCE); 1,1,1-trichloroethane (TCA); trichloroethene (TCE); and tetrachloroethene (PCE); have consistently been detected in site soils, monitoring wells and in the impacted residential well.

3.1.2 Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in the soil and ground water and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Soil

During the RI, surface and sub-surface soil samples were collected from selected areas around the site. Figure 3 shows where soil samples were taken and the relative amounts of contaminants at each sampling point. No VOCs were detected in surface soil samples above SCGs. A soil gas survey was used to locate areas of subsurface contamination. Based on soil gas results and historical information a test pit investigation was conducted to determine the extent of subsurface contamination. Test pit sampling identified a localized area of solvent contaminated subsurface soil in the former lagoon/bermed area. Some of the more important compounds that were found to exceed the SCGs in subsurface soil are as follows: TCA, 1,2-DCE, toluene, and xylenes. The SCGs were exceeded by as much as the following values: 1900 ppb, 2000 ppb, 600 ppb, and 48800 ppb, respectively. This, and additional information, is tabulated in Table 1.

Groundwater

Groundwater elevations measured in the on-site monitoring wells indicate a groundwater flow direction in the upper 50 feet of glacial deposits to the east-northeast. A private residential well which has been impacted by the site, is located down gradient across Little Pond Road and to the north of the site. The average hydraulic gradient for the groundwater levels measured in shallow and deep monitoring wells during the RI is estimated at 0.04 feet per foot. The hydraulic conductivity (K) of the two monitoring zones were estimated at 2×10^{-4} feet per minute (ft/min) for the shallow wells and 2×10^{-6} ft/min for the deep wells. The seepage velocity in the shallow monitoring zone has been estimated at approximately 14 ft/year, while a much lower seepage velocity of 0.1 ft/year has been estimated for the deep zone.

On-site monitoring well MW-7, located in or near the suspected source of contamination, contained the highest levels of 1,2-DCE, PCE, and TCE. These contaminants were detected as high as 20,000 ppb, 490 ppb, and 280 ppb respectively during different sampling events. MW-6, which is located north of the former lagoon area and just west of the two concrete block buildings, contained the highest detected level of TCA at 840 ppb. MW-3 contained the highest level of vinyl chloride at 2,900 ppb. This is to be expected since MW-3 is located directly down gradient from MW-7, which contains parent compounds of vinyl chloride. Monitoring wells MW-4 and MW-5, located down gradient from MW-7 and the former lagoon area, also contained elevated levels of contaminants mainly consisting of TCA, 1,1-DCA, 1,2-DCE, TCE, and PCE.

The off-site residential drinking water well TMB-01 is located down gradient, and to the north, of the site. Water samples collected from this well indicate contamination consisting of, but not limited to, TCA [3 ppb], 1,1-DCE [2 ppb], and TCE [28 ppb]. The concentrations of these chemicals were far lower than those detected in on-site monitoring wells.

3.2 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 1993 the NYSDEC installed a Granular Activated Carbon system (GAC), on the impacted off-site residential drinking water well to remove the VOC contamination which was present above drinking water standards.

3.3 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 site. A more detailed discussion of the health risks can be found in Section 6.1 of the RI Report.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Pathways which are known to or may exist at the site affect future on-site residents and both current and future off-site residents. Assuming a child or adult resident could spend part or all of their day outdoors, inadvertent ingestion and dermal contact with contaminated soils could provide a pathway for exposure. Exposure to groundwater can also provide a pathway for exposure both to future residents and current off-site residents. Exposure can occur through ingestion of ground water, dermal contact with ground water during showering or household uses, and inhalation of volatiles in ground water during showering. In the case of the impacted off-site residential property the ground water pathway was formerly complete; however, exposure is currently eliminated by the well head treatment provided by the carbon filter.

3.4 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 Analysis included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources.

The only exposure pathway which appears significant is direct contact with subsurface soils on the site by resident organisms. Indirect exposures are also possible via ingestion of plant and/or animal tissues which may have accumulated site chemicals by primary, secondary, and tertiary consumers. However, the secondary and tertiary vertebrate consumers are unlikely to derive a significant proportion of their diet from the site, because such animals tend to have foraging areas substantially larger than the site. No off site soil, sediment or surface water samples were collected to help evaluate off site impacts. However, data collected from the site did not indicate a potential offsite impact beyond that of the affected residential wells.

SECTION 4: ENFORCEMENT STATUS

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 NYSDEC and Borg-Warner Automotive, Inc. entered into a Consent Order on May 5, 1995. The Order obligated this responsible party to implement a RI/FS program. Upon issuance of the Record of Decision, the NYSDEC will approach all of the PRPs, to implement the selected remedy under an Order on Consent.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to restore the site to pre-disposal conditions to the extent feasible and authorized by law.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Reduce, control, or eliminate to the extent practicable the contamination present within the soils on site and their impact on groundwater.
- Eliminate the potential for direct human or animal contact with the contaminated soils on site.
- Mitigate the impacts of contaminated groundwater to the environment.
- Provide for attainment of SCGs for groundwater quality at the limits of the area of concern (AOC), to the extent practicable.

SECTION 6: 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 Cole-Zaiser site were identified, screened and evaluated in the report entitled "Focused Feasibility Study Report - Cole-Zaiser Site Amboy, New York, June 1, 1998."

A summary of the detailed analysis follows. As presented below, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

6.1 Description of Alternatives

The potential remedies are intended to address the contaminated subsurface soil and groundwater at the site. The feasibility of restoring groundwater quality at a site is highly dependent on site characteristics. The seepage velocity in the shallow monitoring zone at Cole-Zaiser has been estimated at approximately 14 ft/year, while a much lower seepage velocity of 0.1 ft/year has been estimated for the deep zone. The slow seepage velocity and low hydraulic conductivity found at the site make traditional groundwater remedial techniques impractical. The alternatives developed address the source area of contamination in the lagoon/bermed area and remove groundwater receptors by providing a source of drinking water to the affected groundwater user outside the area of contamination. All the alternatives developed, with the exception of the no action alternative, eliminate exposures to the public and environment. The alternatives will also facilitate the restoration of groundwater to pre-disposal conditions through natural attenuation by removing the source of groundwater contamination.

Alternative 1: No Further Action

Present Worth:	$ 0
Capital Cost:	$ 0
Annual O&M:	$ 0
Time to Implement:	Immediate

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain contaminated. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2A: Ex-Situ Low Temperature Thermal Desorption (LTTD) and Institutional Controls

Present Worth:	$ 825,400
Capital Cost:	$ 685,100
Annual O&M:	$ 32,400
Time to Implement:	9-12 Months

The source area of contamination at the Cole-Zaiser site contains highly contaminated soil and groundwater. This alternative would involve the excavation and on-site treatment of subsurface soils in order to meet the proposed remedial goals. Confirmatory sampling of the walls and floor of the excavation would be done to ensure that all contaminated soil is removed. Although no long term groundwater remediation program is called for in this alternative, there is a provision to collect highly contaminated groundwater in the direct vicinity of the source. Since there will be an open excavation, the removal of groundwater that collects in that excavation is feasible and should reduce the time frame for attaining the remedial objectives which includes restoration of the site to pre-disposal conditions. Determining how much water to remove from the excavation will be highly dependent on site conditions, which won't be known until construction of the remedy. These conditions include the size of the excavation, rate of groundwater infiltration, and groundwater elevation. To provide treatment of the groundwater component of the contamination source, in and adjacent to the source area, the excavation would be left open and groundwater would continue to be collected and removed for treatment/disposal. The intent of the groundwater removal is not to aggressively dewater the formation, but to remove the groundwater component of the source area. The removal would be ended based upon the hydraulic conditions at the site, after a time period to be determined by the NYSDEC.

Following excavation, soil would be treated using LTTD and returned to the excavated area as clean fill. LTTD is a process by which heat is used to volatilize the contaminants from the contaminated soil. Once freed from the soil, the vapors are collected and treated by an appropriate method. The impacted off site groundwater well currently in use would be replaced with a new, deeper well located upgradient or side gradient of the plume. Deed restrictions would be placed on the Cole-Zaiser site and impacted off site residence to prevent use of existing wells, future well installations or basement excavations. These restrictions would be obtained through an agreement with the affected property owners. If agreements with the affected property owners could not be reached, alternate means of addressing groundwater contamination would be pursued. Ground water would be monitored following the implementation of this alternative and would continue until groundwater standards were achieved.

Alternative 2B: Ex-Situ Soil Vapor Extraction and Institutional Controls

Present Worth:	$ 554,300
Capital Cost:	$ 414,000
Annual O&M:	$ 32,400
Time to Implement:	8-9 Months

The excavation and institutional controls planned for this alternative would be identical to Alternative 2A except that the VOC contaminated soil would be treated by an onsite, ex-situ soil vapor extraction system. This process would be used to extract volatile organic compounds (VOCs) from soils. Soil would be excavated, stockpiled, and covered with a polyethylene liner. Horizontal slotted piping would be placed within the waste mass, from which air could be drawn or injected. The slotted piping network would be connected to a blower, which would create a negative pressure gradient throughout the soil pile. Because of the pressure gradient, the contaminants in the soil would volatilize and diffuse through air spaces between soil particles to the extraction pipes. The vacuum established would continuously draw VOC contaminated air from the soil pores and draw fresh air from the injection pipes.

The removed volatiles would be processed through a liquid-vapor separator and then treated initially by an activated carbon bed, catalytic converter, or after burner. If air monitoring demonstrates emission levels are below values calculated using the NYSDEC's Air Guide 1, Version 3.1 (or latest version), air treatment could be discontinued with NYSDEC approval. In addition, a gravel layer connected to a sump would be installed to collect any leachate generated initially by stockpiling saturated soil. Water collected from the pile would be stored and either treated on site, or sent off site for disposal/treatment.

The removal and treatment of the groundwater component of the source, backfilling operations, groundwater monitoring and the replacement of the residential well would occur as described in Alternative 2A.

<u>Alternative 3: Off-Site Disposal and Institutional Controls</u>

Present Worth:	$ 1,351,500
Capital Cost:	$ 1,211,200
Annual O&M:	$ 32,400
Time to Implement:	3-6 Months

The excavation and institutional controls planned for this alternative would be identical to Alternatives 2A and 2B except that excavated soils would be transported off-site to a hazardous waste landfill for disposal. The removal and treatment of the groundwater component of the source area would be carried out as described in Alternative 2. Excavated soil materials would be replaced with clean fill. Ground water monitoring and residential well replacement would occur as described in Alternative 2A.

<u>Alternative 4: In-Situ Soil Vapor Extraction (SVE) and Institutional Controls</u>

Present Worth:	$ 592,800
Capital Cost:	$ 298,100
Annual O&M:	$ 68,075
Time to Implement:	Immediate

Vapor extraction wells would be installed in the source area and would be screened above the water table in the vadose zone. All wells would be joined with a manifold and connected to the vacuum side of a blower motor, which induces a negative pressure gradient within the soil. This pressure gradient creates an air current through the soil pores causing air to diffuse from the soil into the extraction wells for removal. Atmospheric air is then drawn into the soil and the process is repeated. The introduction of air induces an equilibrium shift where sorbed VOCs volatilize into a vapor, diffuse through the soil airspace towards the extraction wells, and are removed. The induced vacuum continuously extracts VOCs from the soil. The VOCs removed would be treated as described in Alternative 2B. A new residential well would also be installed as in 2A, 2B, and 3.

6.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is included in the Feasibility Study.

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 addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

The no action alternative would not meet SCGs since it leaves concentrations of contaminants of concern in the soil above remedial goals. In addition, this alternative does nothing to mitigate the identified exposure pathways or protect the off-site receptor.

Alternatives 2A, 2B, 3, and 4 all meet applicable SCGs for the source area soil since the soil would either be treated to contaminant levels that are below remedial goals, or removed from the site entirely. The SCGs for groundwater would be addressed to the extent practicable through natural attenuation.

Table 3 contains a list of applicable SCGs.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

The no action alternative (Alternative 1) would not be protective of human health or the environment.

There has currently been no specific significant threat to the environment identified which is related to the contaminated groundwater at the site. A private residential well, which has been impacted by the site, is located across Little Pond Road down gradient and to the north of the site. The remedy calls for the installation of a new drinking water well which would eliminate the existing threat to public health posed by the contaminated groundwater. Therefore, with the implementation of alternatives 2A, 2B, 3, or 4; there would be no significant threats remaining to the public health or the environment. Although the contaminated plume of groundwater would not be actively treated, the removal of the contaminant source and natural attenuation should provide removal/degradation of contaminants that would be consistent with the results obtained from an active treatment system. This is due primarily to the existing soil characteristics at the site (e.g. compacted silty sand).

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.

The no action alternative would not increase risks in the short-term, since no intrusive activities would occur. Alternatives 2A, 2B, and 3 would involve excavation and handling of contaminated soil. These actions could potentially impact worker health and safety, the environment, and nearby down-wind receptors. Alternative 4 would involve minimal invasive activities. With the exception of the no action alternative, this alternative presents the lowest short term impacts to the site and surrounding area. The use of proper health and safety procedures, good personal hygiene, proper use of engineering controls such as dust suppression, and air monitoring would minimize the short term impacts associated with all alternatives.

Alternative 3 would involve off-site transportation of contaminated soils. This alternative may present a short-term risk due to possible spills of contaminated soil off-site. This effect could be minimized by proper distribution of the load, covering the load with a tarp, and ensuring that all drivers are familiar with emergency spill response measures.

Alternatives 2A, 2B, and 4 would be expected to involve treatment of air emissions prior to discharge; depending on the nature and concentrations of the vapor constituents. These alternatives would pose a short-term risk should the air emissions control devices fail and the concentrations of the vapor constituents are at an unacceptable level. This risk would be minimized through the use of air treatment devices, and the establishment of emergency procedures to be utilized in the event of a release.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the

magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

The no action alternative would not be effective or permanent because no contaminant reduction would occur. Alternatives 2A, 2B, 3 and 4 would all be effective and permanent in the long term since all likely exposure pathways would be eliminated, contaminant concentrations in soil would be reduced below remedial goals, and groundwater contaminant concentrations would be expected to decrease over time.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

The no action alternative would not reduce the toxicity, mobility, or volume of any contaminant in soil or groundwater. Alternatives 2A, 2B, 3, and 4 would all provide a reduction in toxicity, mobility, and volume in the source area by removing or treating the soils containing the highest concentrations of contaminants.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction 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..

The no action alternative would be the easiest to implement at the site since no construction would be required and no monitoring would be performed. Alternative 3 would also be relatively easy to implement since no staging or storage area would be required. Alternatives 2A and 2B, although more involved than the previous alternatives, could be easily engineered. Vendor equipment is readily available, and there are no significant regulatory requirements. Properly planned, these alternatives would be easy to implement and operate to completion. Alternative 4 may be more difficult to implement since it would require pilot testing and O&M throughout the operation of in-situ SVE.

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.

The costs include the present worth based on a 5% discount rate over five years. A five year period was selected since the operation and maintenance, which would consist of groundwater monitoring following completion of the soil remediation activities, is expected to continue through this time frame. The reduction in contaminant levels would be evaluated at the end of the five year period and, if necessary, additional monitoring requirements would be addressed.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon 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 have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to the concerns raised. In general the public comments received were supportive of the selected remedy. Two property owners requested that their wells be analyzed due to their close proximity to the site.

One of the wells was tested in 1992 and found to be free from contamination.

Data collected during the site remedial investigation support that the well should not have been impacted by the site. In response to the recent request, the Oswego County Health Department collected a sample from the well and analyzed it for the site contaminants. The contaminants toluene, ethylbenzene, sec-butylbenzene, and 4-isopropyltoluene were detected in the private well. The contaminants found in this well are constituents in many common petroleum products; including gasoline, fuel oil, and diesel fuel. Although the source of contamination in the well has not yet been identified, based on the existing analytical data and our evaluation of the transport mechanisms, this contamination does not appear to be related to the Cole-Zaiser site. A more detailed account of this well sampling can be found in the Responsiveness Summary section of this Record of Decision.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is selecting **Alternative 2B: Ex-Situ Soil Vapor Extraction and Institutional Controls** as the remedy for this site.

This selection is based upon the evaluation of the five alternatives developed for this site. With the exception of the no action alternative, each of the alternatives would comply with the threshold criteria. In addition, all four alternatives are similar with respect to the majority of the balancing criteria. The only major differences between these alternatives are cost. Alternatives 2B (ex-situ SVE) and 4 (in-situ SVE) were the lowest cost alternatives. Alternative 4, is the only alternative which would not actively remove and treat contaminated soil which is contributing to groundwater contamination. Furthermore, this alternative would require the implementation of a pilot test in order to collect additional data necessary to properly design a full scale SVE system for the site. Alternative 2B will provide for the removal of the source materials from the ground, allowing a visual and analytical inspection to ensure that all of the soil containing contaminants in excess of the proposed remedial goals will be removed and treated before being replaced in the ground. Alternative 2B will also be the lower cost of the two alternatives.

Although active groundwater remediation is not practical at the Cole-Zaiser site, the removal of the source area of contamination (the former waste oil lagoon) should facilitate the restoration of pre-disposal groundwater conditions. In January 1997 monitoring well MW-7, located in or near the suspected source of contamination, contained the highest levels of total volatiles (approx 22 ppm). MW-6, which is located 95 feet north of the former lagoon area, contained much lower total volatiles (approx 0.73 ppm). The impacted off site drinking water well, located 285 feet from the lagoon area, contained still lower total volatiles (0.032 ppm). Based on the available data, it is evident that groundwater is flowing slowly and that chlorinated solvent concentrations drop rapidly with distance from the source area. In addition, vinyl chloride concentrations are greater at wells further from the source area. Since vinyl chloride is a break down product of the chlorinated solvents disposed, this indicates that contaminants are attenuating naturally. By removing the source of groundwater contamination, the residual contaminants should attenuate naturally to pre-disposal conditions.

The estimated present worth cost to implement the remedy is $554,300. The cost to construct the remedy is estimated to be $414,000 and the estimated present worth for the operation and maintenance cost over 5 years is $140,300.

The elements of the selected remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved.

2. An approximately 75' x 100' staging pad will be constructed for the ex-situ SVE treatment system. The actual dimensions of the pad will be determined during design, based on the SVE system requirements. A leachate collection system for initially dewatering soil, and later for collecting leachate during treatment activities, will be constructed on the staging pad.

3. Contaminated soil will be excavated from the area containing the most contamination and placed on the staging pad. Confirmatory samples will then be collected from the sides and bottom of the excavation to ensure that all contaminated soil has been removed with attention to sampling in the areas of the former lagoon and southeast drainage ditch. Excavation will continue until sampling showed soil, above the remedial goals presented in Table 3, had been removed.

4. To provide treatment of the groundwater component of the contamination source, in and adjacent to the source area, the excavation will be left open and groundwater will continue to be collected and removed for treatment/disposal. The intent of the groundwater removal is not to aggressively dewater the formation, but to remove the groundwater component of the source area. The removal would be ended based upon the hydraulic conditions at the site, after a time period to be determined by the NYSDEC.

5. An ex-situ SVE system comprised of the soil pile, lateral pipes for air induction and extraction, a blower, and a cover will be constructed on the staging pad. Air emissions will be treated until it is demonstrated that emission levels are below levels calculated using the NYSDEC's Air Guide 1, Version 3.1 (or latest version).

6. Soil will be treated until remedial goals are achieved. Since the remedial goals for hazardous waste at the site are based on TAGM 4046 screening levels, and are below those required under *40 CFR, Part 268, Land Disposal Restrictions Phase II - Universal Treatment Standards,* the soil will no longer have to be handled as hazardous waste and will be backfilled on site.

7. Upon completion of soil treatment the treated soil will be backfilled on the site. The entire area will be covered with a layer of topsoil, and seeded to promote vegetative cover; thereby reducing erosion.

8. As early in the process as possible, a new well will be installed on the residential property at a location which is side gradient to the existing groundwater contamination. This well will be sampled semi-annually for a period of two years. If the well remains free from contamination over this period, monitoring of the residential well will cease. If the well becomes contaminated, potable water will be provided by other means.

9. A written notification will be affixed to the deeds of the property comprising the Cole-Zaiser site and the adjacent property with an impacted well, at the Oswego County Recorder's Office which will prohibit the use of currently existing wells, prevent the installation of any additional potable or non-potable groundwater supply well, and the excavation of basements in the area of groundwater contamination on both properties. The restrictions will be placed through an agreement with the property owners. If an agreement can not be reached, other means of addressing groundwater contamination will be pursued.

10. Periodic groundwater samples will be collected and analyzed from monitoring wells until contaminants are below groundwater standards. The site will be periodically evaluated to determine whether a change in classification on the Registry of Inactive Hazardous Waste Disposal Sites is warranted.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation (CP) activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A repository for documents pertaining to the site was established.

- A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.

- A fact sheet was sent in June 1996 to the site mailing list announcing the commencement of the Remedial Investigation and describing the work planned.

- A fact was sent in September 1998 to the site mailing list announcing the release of the Proposed Remedial Action Plan (PRAP) and the public meeting. This fact sheet gave a very brief summary of the RI/FS, as well as the State's recommended remedy for the site.

- A public meeting was held on September 17, 1998 to present the results of the Remedial Investigation and Feasibility Study (RI/FS). Comments on the PRAP, which summarized the State's recommended remedy for the site, were solicited.

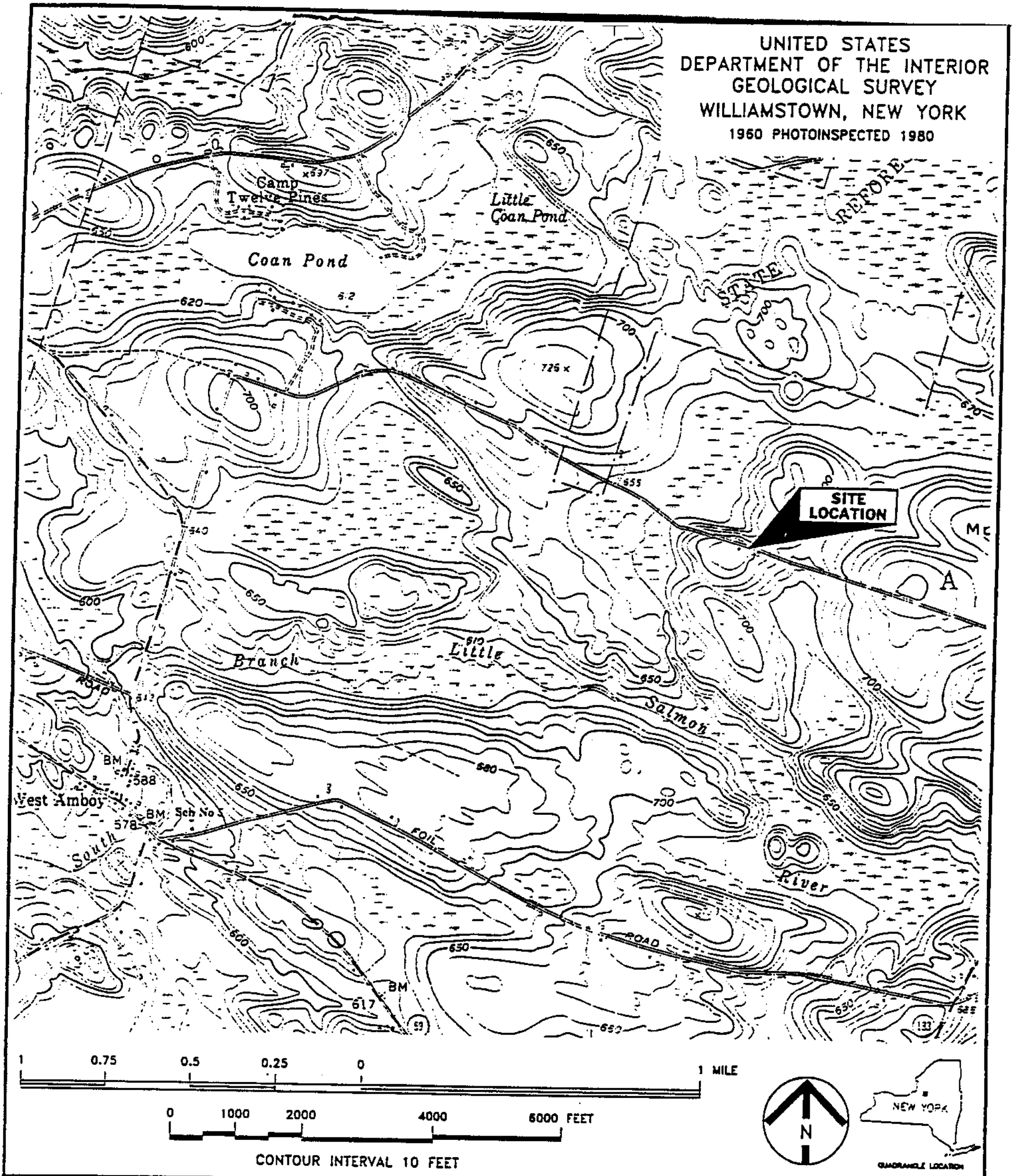
- In October 1998 a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the PRAP.

Table 1
Nature and Extent of Contamination for the Cole-Zaiser Site
Site No. 738013

MEDIA	CLASS	CONTAMINANT	CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND (.001) to 840	13 of 35	5
		1,1-Dichloroethane	ND (.001) to 280	13 of 35	5
		1,1-Dichloroethene	ND (.001) to 14	3 of 35	5
		1,2-Dichloroethene	ND (.001) to 20,000	15 of 35	5
		Benzene	ND (.001) to 23	1 of 35	1.0
		Tetrachloroethene	ND (.001) to 490	10 of 35	5
		Toluene	ND (.001) to 47	5 of 35	5
		Trichloroethene	ND (.001) to 280	10 of 35	5
		Vinyl Chloride	ND (.001) to 2,900	13 of 35	2
Soils	Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND (.001) to 2,700	2 of 36	800
		1,2-Dichloroethene	ND (.001) to 2,300	3 of 36	300
		Toluene	ND (.001) to 2,100	3 of 36	1,500
		Xylenes (Total)	ND (.001) to 50,000	3 of 36	1,200

Table 2 Remedial Alternative Cost			
Remedial Alternative	**Capital Cost**	**Annual O&M**	**Total Present Worth**
Alternative 1: No Further Action	$0	$0	$0
Alternative 2A: EX-Situ LTTD and Institutional Controls	$685,100	$32,400	$825,400
Alternative 2B: Ex-Situ Soil Vapor Extraction and Institutional Controls	$414,000	$32,400	$554,300
Alternative 3: Off-Site Disposal and Institutional Controls	$1,211,200	$32,400	$1,351,500
Alternative 4: In-Situ and Institutional Controls	$298,100	$68,075	$592,800

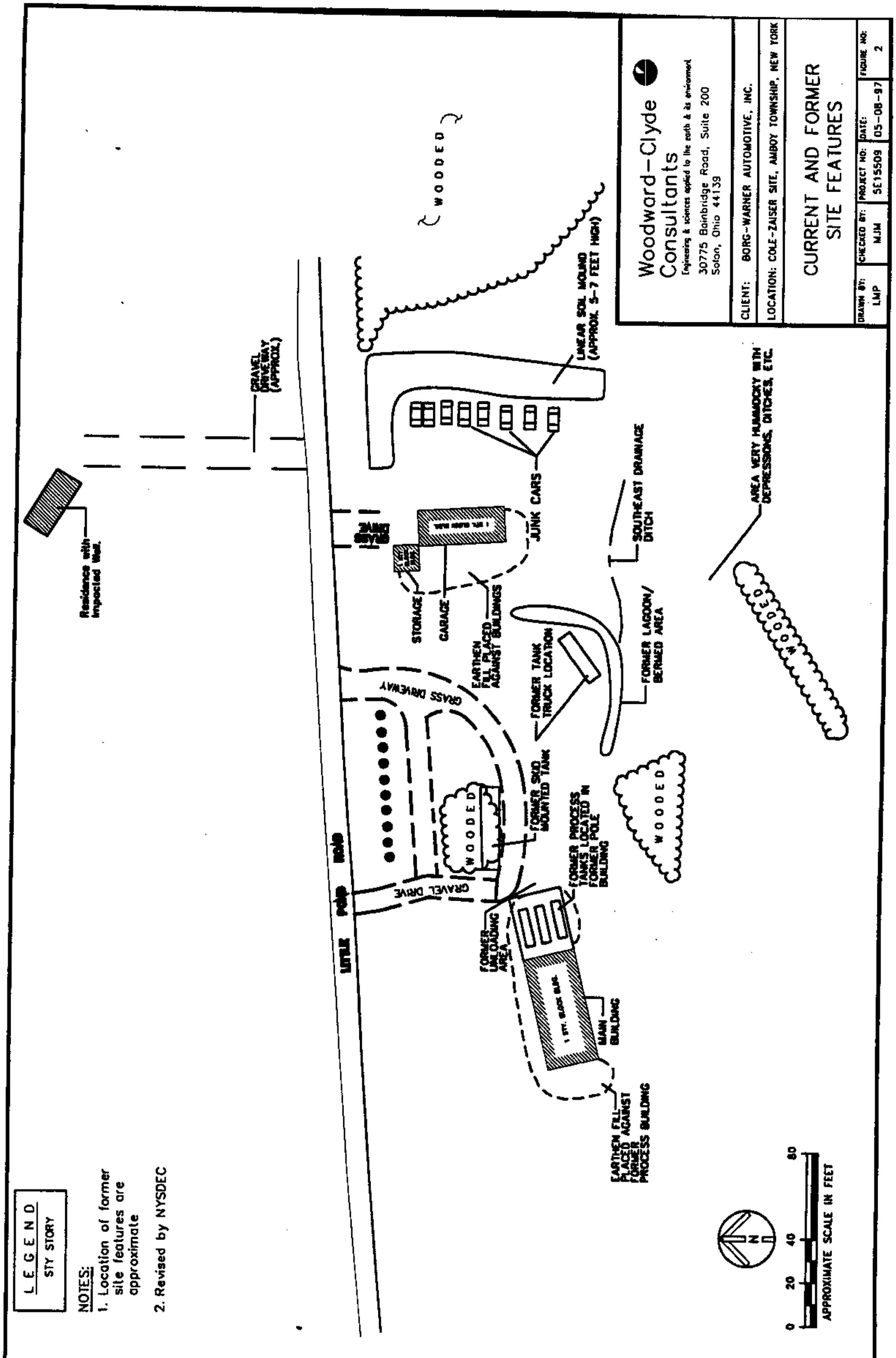
Table 3 Remedial Goals		
Compound	**Remedial Goal for Soil (ppb)**	**Remedial Goal for Groundwater (ppb)**
Chlorinated VOCs		
Tetrachloroethene	1,400	5
Trichloroethene	700	5
1,1,1-Trichloroethane	800	5
1,2-Dichloroethene	300	5
1,1-Dichloroethane	200	5
1,1-Dichloroethene	400	5
Vinyl Chloride	200	2
Petroleum-Related VOCs		
Benzene	60	1.0
Ethylbenzene	5,500	5
Toluene	1,500	5
Xylenes	1,200	5
Total VOCs	10,000	—

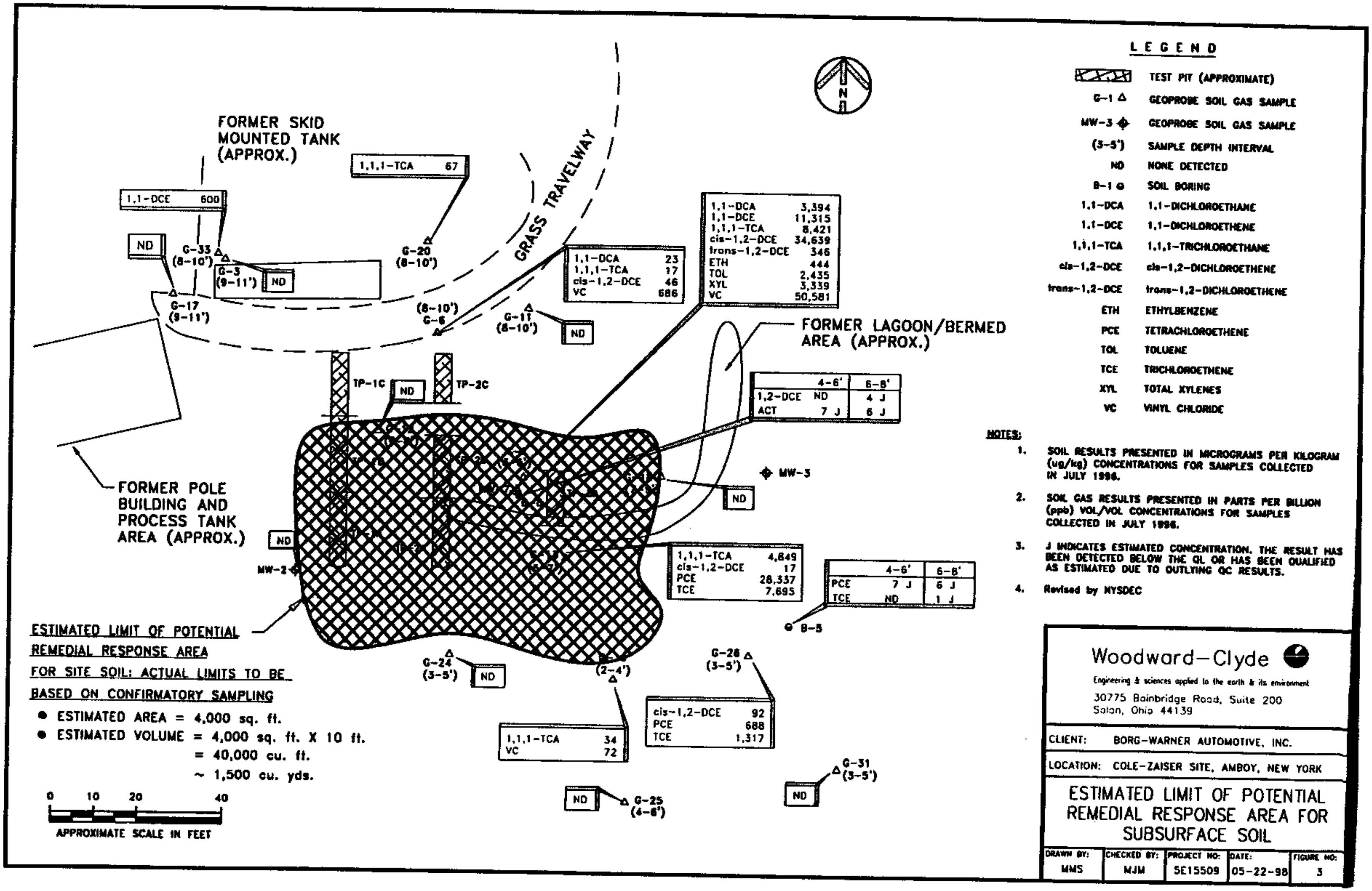


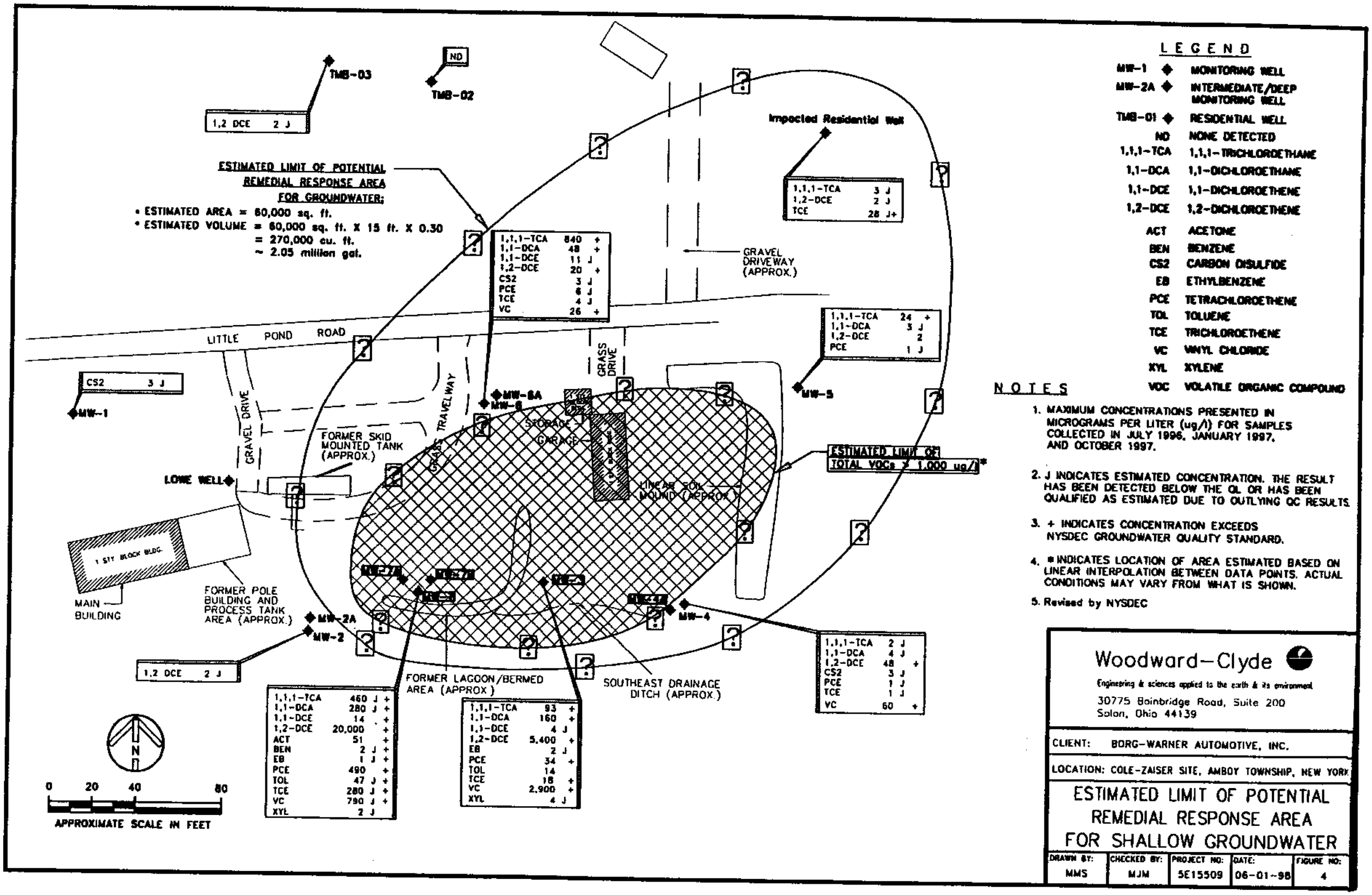
Woodward-Clyde Consultants

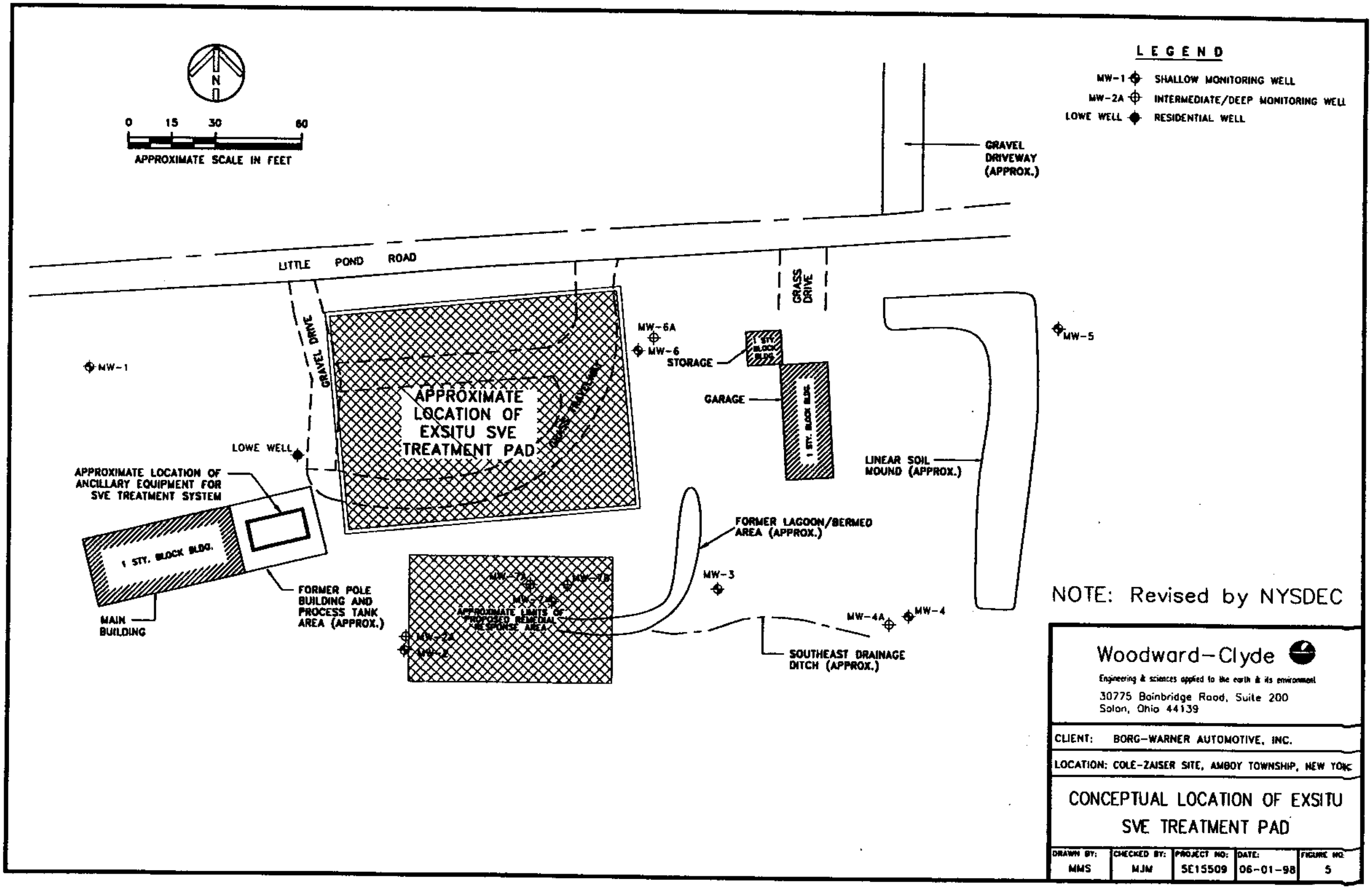
GENERAL LOCATION MAP
COLE-ZAISER SITE - AMBOY, NEW YORK

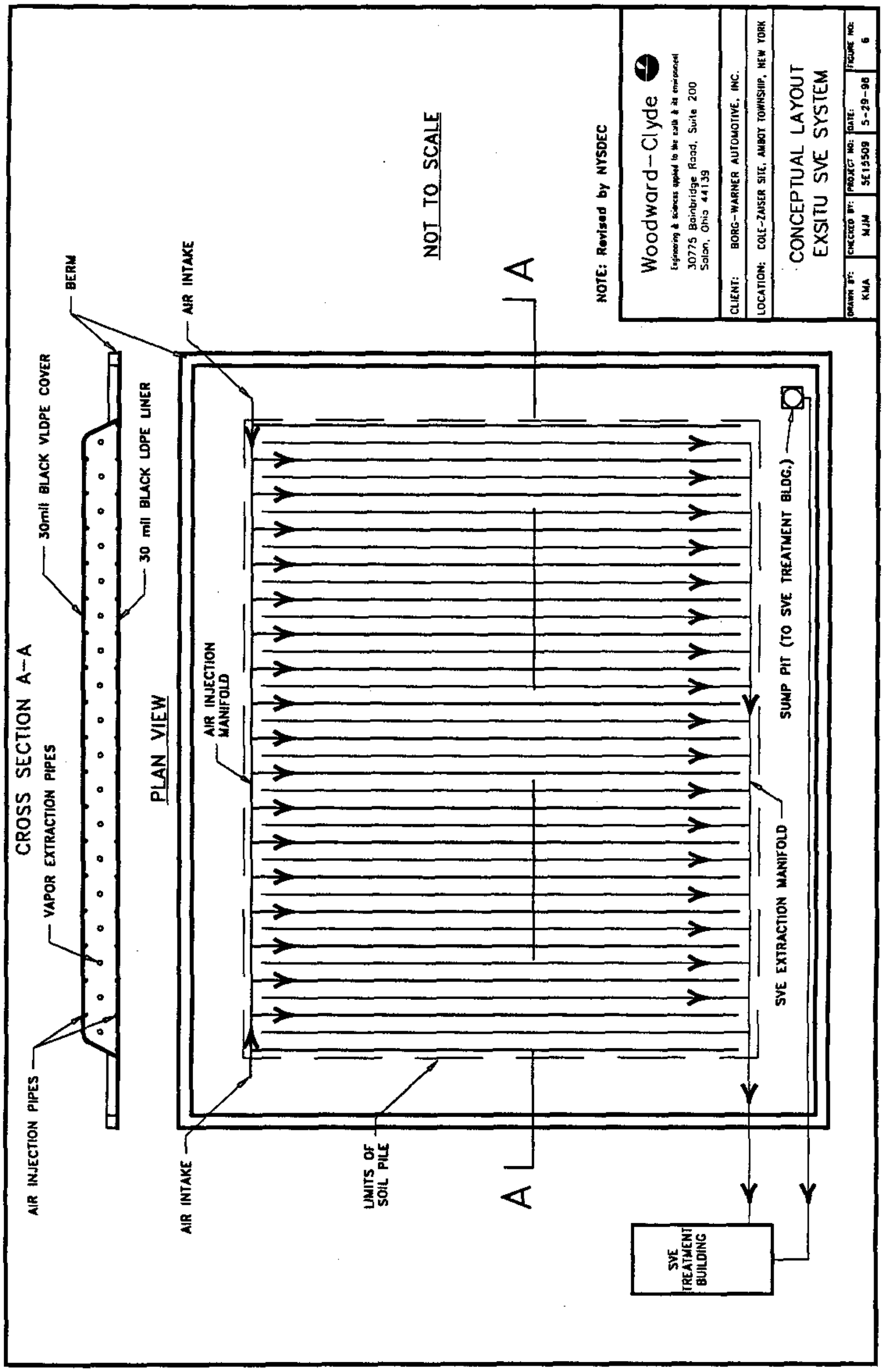
DRAWN BY: LMP	CHECKED BY: MJM	PROJECT NUMBER: 5E15509	DATE: 4-24-97	FIGURE NO: 1-1


Woodward-Clyde Consultants
Engineering & sciences applied to the earth & its environment
30775 Bainbridge Road, Suite 200
Solon, Ohio 44139
CLIENT: BORG-WARNER AUTOMOTIVE, INC.
LOCATION: COLE-ZAISER SITE, AMBOY TOWNSHIP, NEW YORK
CURRENT AND FORMER SITE FEATURES
DRAWN BY: LMP
CHECKED BY: MJM
PROJECT NO: 5E15509
DATE: 05-08-97
FIGURE NO: 2
WOODED
LINEAR SOIL MOUND (APPROX. 5-7 FEET HIGH)
GRAVEL DRIVEWAY (APPROX.)
Residence with Impacted Well.
JUNK CARS
SOUTHEAST DRAINAGE DITCH
AREA VERY HUMMOCKY WITH DEPRESSIONS, DITCHES, ETC.
GRASS DRIVE
1 STY. BLOCK BLDG.
STORAGE
GARAGE
EARTHEN FILL PLACED AGAINST BUILDINGS
FORMER TANK TRUCK LOCATION
FORMER LAGOON/ BERMED AREA
GRASS DRIVEWAY
FORMER SKID MOUNTED TANK
FORMER PROCESS TANKS LOCATED IN FORMER POLE BUILDING
GRAVEL DRIVE
LITTLE POND ROAD
FORMER UNLOADING AREA
MAIN BUILDING
EARTHEN FILL PLACED AGAINST FORMER PROCESS BUILDING
LEGEND
STY STORY
NOTES:
1. Location of former site features are approximate
2. Revised by NYSDEC
N
0 20 40 80
APPROXIMATE SCALE IN FEET


LEGEND
TEST PIT (APPROXIMATE)
G-1 GEOPROBE SOIL GAS SAMPLE
MW-3 GEOPROBE SOIL GAS SAMPLE
(3-5') SAMPLE DEPTH INTERVAL
ND NONE DETECTED
B-1 SOIL BORING
1,1-DCA 1,1-DICHLOROETHANE
1,1-DCE 1,1-DICHLOROETHENE
1,1,1-TCA 1,1,1-TRICHLOROETHANE
cis-1,2-DCE cis-1,2-DICHLOROETHENE
trans-1,2-DCE trans-1,2-DICHLOROETHENE
ETH ETHYLBENZENE
PCE TETRACHLOROETHENE
TOL TOLUENE
TCE TRICHLOROETHENE
XYL TOTAL XYLENES
VC VINYL CHLORIDE
NOTES:
1. SOIL RESULTS PRESENTED IN MICROGRAMS PER KILOGRAM (ug/kg) CONCENTRATIONS FOR SAMPLES COLLECTED IN JULY 1996.
2. SOIL GAS RESULTS PRESENTED IN PARTS PER BILLION (ppb) VOL/VOL CONCENTRATIONS FOR SAMPLES COLLECTED IN JULY 1996.
3. J INDICATES ESTIMATED CONCENTRATION. THE RESULT HAS BEEN DETECTED BELOW THE QL OR HAS BEEN QUALIFIED AS ESTIMATED DUE TO OUTLYING QC RESULTS.
4. Revised by NYSDEC
FORMER SKID MOUNTED TANK (APPROX.)
GRASS TRAVELWAY
FORMER LAGOON/BERMED AREA (APPROX.)
FORMER POLE BUILDING AND PROCESS TANK AREA (APPROX.)
1,1-DCE 600
1,1,1-TCA 67
1,1-DCA 23
1,1,1-TCA 17
cis-1,2-DCE 46
VC 686
1,1-DCA 3,394
1,1-DCE 11,315
1,1,1-TCA 8,421
cis-1,2-DCE 34,639
trans-1,2-DCE 346
ETH 444
TOL 2,435
XYL 3,339
VC 50,581
4-6' 6-8'
1,2-DCE ND 4 J
ACT 7 J 6 J
1,1,1-TCA 4,849
cis-1,2-DCE 17
PCE 28,337
TCE 7,695
4-6' 6-8'
PCE 7 J 6 J
TCE ND 1 J
cis-1,2-DCE 92
PCE 688
TCE 1,317
1,1,1-TCA 34
VC 72
G-33 (8-10')
G-3 (9-11')
G-17 (9-11')
G-20 (8-10')
G-6 (8-10')
G-11 (8-10')
TP-1C
TP-2C
MW-3
MW-2
B-5
G-24 (3-5')
G-26 (3-5')
(2-4')
G-25 (4-6')
G-31 (3-5')
ND
ESTIMATED LIMIT OF POTENTIAL REMEDIAL RESPONSE AREA FOR SITE SOIL: ACTUAL LIMITS TO BE BASED ON CONFIRMATORY SAMPLING
• ESTIMATED AREA = 4,000 sq. ft.
• ESTIMATED VOLUME = 4,000 sq. ft. X 10 ft.
= 40,000 cu. ft.
~ 1,500 cu. yds.
0 10 20 40
APPROXIMATE SCALE IN FEET
Woodward-Clyde
Engineering & sciences applied to the earth & its environment
30775 Bainbridge Road, Suite 200
Solon, Ohio 44139
CLIENT: BORG-WARNER AUTOMOTIVE, INC.
LOCATION: COLE-ZAISER SITE, AMBOY, NEW YORK
ESTIMATED LIMIT OF POTENTIAL REMEDIAL RESPONSE AREA FOR SUBSURFACE SOIL
DRAWN BY: MMS
CHECKED BY: MJM
PROJECT NO: 5E15509
DATE: 05-22-98
FIGURE NO: 3


LEGEND
MW-1 MONITORING WELL
MW-2A INTERMEDIATE/DEEP MONITORING WELL
TMB-01 RESIDENTIAL WELL
ND NONE DETECTED
1,1,1-TCA 1,1,1-TRICHLOROETHANE
1,1-DCA 1,1-DICHLOROETHANE
1,1-DCE 1,1-DICHLOROETHENE
1,2-DCE 1,2-DICHLOROETHENE
ACT ACETONE
BEN BENZENE
CS2 CARBON DISULFIDE
EB ETHYLBENZENE
PCE TETRACHLOROETHENE
TOL TOLUENE
TCE TRICHLOROETHENE
VC VINYL CHLORIDE
XYL XYLENE
VOC VOLATILE ORGANIC COMPOUND
NOTES
1. MAXIMUM CONCENTRATIONS PRESENTED IN MICROGRAMS PER LITER (ug/l) FOR SAMPLES COLLECTED IN JULY 1996, JANUARY 1997, AND OCTOBER 1997.
2. J INDICATES ESTIMATED CONCENTRATION. THE RESULT HAS BEEN DETECTED BELOW THE QL OR HAS BEEN QUALIFIED AS ESTIMATED DUE TO OUTLYING QC RESULTS.
3. + INDICATES CONCENTRATION EXCEEDS NYSDEC GROUNDWATER QUALITY STANDARD.
4. * INDICATES LOCATION OF AREA ESTIMATED BASED ON LINEAR INTERPOLATION BETWEEN DATA POINTS. ACTUAL CONDITIONS MAY VARY FROM WHAT IS SHOWN.
5. Revised by NYSDEC
ESTIMATED LIMIT OF POTENTIAL REMEDIAL RESPONSE AREA FOR GROUNDWATER:
• ESTIMATED AREA = 60,000 sq. ft.
• ESTIMATED VOLUME = 60,000 sq. ft. X 15 ft. X 0.30 = 270,000 cu. ft. ~ 2.05 million gal.
TMB-03
1,2 DCE 2 J
ND
TMB-02
Impacted Residential Well
1,1,1-TCA 3 J
1,2-DCE 2 J
TCE 28 J+
1,1,1-TCA 840 +
1,1-DCA 48 +
1,1-DCE 11 J
1,2-DCE 20 +
CS2 3 J
PCE 6 J
TCE 4 J
VC 26 +
GRAVEL DRIVEWAY (APPROX.)
LITTLE POND ROAD
GRASS DRIVE
1,1,1-TCA 24 +
1,1-DCA 3 J
1,2-DCE 2
PCE 1 J
MW-5
CS2 3 J
MW-1
MW-6A
MW-6
GRAVEL DRIVE
GRASS TRAVELWAY
FORMER SKID MOUNTED TANK (APPROX.)
STORAGE GARAGE
LINEAR SOIL MOUND (APPROX.)
ESTIMATED LIMIT OF TOTAL VOCs > 1,000 ug/l*
LOWE WELL
1 STY BLOCK BLDG.
MAIN BUILDING
FORMER POLE BUILDING AND PROCESS TANK AREA (APPROX.)
MW-7A
MW-7B
MW-7
MW-3
MW-4A
MW-4
MW-2A
MW-2
1,2 DCE 2 J
1,1,1-TCA 2 J
1,1-DCA 4 J
1,2-DCE 48 +
CS2 3 J
PCE 1 J
TCE 1 J
VC 60 +
FORMER LAGOON/BERMED AREA (APPROX)
SOUTHEAST DRAINAGE DITCH (APPROX.)
1,1,1-TCA 460 J +
1,1-DCA 280 J +
1,1-DCE 14 +
1,2-DCE 20,000 +
ACT 51 +
BEN 2 J +
EB 1 J +
PCE 490 +
TOL 47 J +
TCE 280 J +
VC 790 J +
XYL 2 J
1,1,1-TCA 93 +
1,1-DCA 160 +
1,1-DCE 4 J
1,2-DCE 5,400 +
EB 2 J
PCE 34 +
TOL 14
TCE 18 +
VC 2,900 +
XYL 4 J
N
0 20 40 80
APPROXIMATE SCALE IN FEET
Woodward-Clyde
Engineering & sciences applied to the earth & its environment
30775 Bainbridge Road, Suite 200
Solon, Ohio 44139
CLIENT: BORG-WARNER AUTOMOTIVE, INC.
LOCATION: COLE-ZAISER SITE, AMBOY TOWNSHIP, NEW YORK
ESTIMATED LIMIT OF POTENTIAL REMEDIAL RESPONSE AREA FOR SHALLOW GROUNDWATER
DRAWN BY: MMS
CHECKED BY: MJM
PROJECT NO: 5E15509
DATE: 06-01-98
FIGURE NO: 4


N
0 15 30 60
APPROXIMATE SCALE IN FEET
LEGEND
MW-1 SHALLOW MONITORING WELL
MW-2A INTERMEDIATE/DEEP MONITORING WELL
LOWE WELL RESIDENTIAL WELL
GRAVEL DRIVEWAY (APPROX.)
LITTLE POND ROAD
GRAVEL DRIVE
GRASS DRIVE
MW-6A
MW-6
STORAGE
1 STY. BLOCK BLDG.
GARAGE
1 STY. BLOCK BLDG.
MW-5
MW-1
APPROXIMATE LOCATION OF EXSITU SVE TREATMENT PAD
LOWE WELL
APPROXIMATE LOCATION OF ANCILLARY EQUIPMENT FOR SVE TREATMENT SYSTEM
LINEAR SOIL MOUND (APPROX.)
FORMER LAGOON/BERMED AREA (APPROX.)
1 STY. BLOCK BLDG.
MAIN BUILDING
FORMER POLE BUILDING AND PROCESS TANK AREA (APPROX.)
MW-3
MW-4A
MW-4
MW-2A
MW-2
APPROXIMATE LIMITS OF PROPOSED REMEDIAL RESPONSE AREA
SOUTHEAST DRAINAGE DITCH (APPROX.)
NOTE: Revised by NYSDEC
Woodward-Clyde
Engineering & sciences applied to the earth & its environment
30775 Bainbridge Road, Suite 200
Solon, Ohio 44139
CLIENT: BORG-WARNER AUTOMOTIVE, INC.
LOCATION: COLE-ZAISER SITE, AMBOY TOWNSHIP, NEW YORK
CONCEPTUAL LOCATION OF EXSITU SVE TREATMENT PAD
DRAWN BY: MMS
CHECKED BY: MJM
PROJECT NO: SE15509
DATE: 06-01-98
FIGURE NO: 5


CROSS SECTION A-A
VAPOR EXTRACTION PIPES
30mil BLACK VLDPE COVER
30 mil BLACK LDPE LINER
BERM
AIR INJECTION PIPES
PLAN VIEW
AIR INJECTION MANIFOLD
AIR INTAKE
AIR INTAKE
LIMITS OF SOIL PILE
SVE EXTRACTION MANIFOLD
SUMP PIT (TO SVE TREATMENT BLDG.)
SVE TREATMENT BUILDING
A
A
NOT TO SCALE
NOTE: Revised by NYSDEC
Woodward-Clyde
30775 Bainbridge Road, Suite 200
Solon, Ohio 44139
CLIENT: BORG-WARNER AUTOMOTIVE, INC.
LOCATION: COLE-ZAISER SITE, AMBOY TOWNSHIP, NEW YORK
CONCEPTUAL LAYOUT
EXSITU SVE SYSTEM
DRAWN BY: KMA
CHECKED BY: MJM
PROJECT NO: 5E15509
DATE: 5-29-98
FIGURE NO: 6

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Cole-Zaiser

Proposed Remedial Action Plan
Amboy(T),Oswego County
Site No. 7-38-013

The Proposed Remedial Action Plan (PRAP) for the Cole-Zaiser site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on September 4, 1998. This Plan outlined the preferred remedial measure proposed for the remediation of the contaminated soil and groundwater at the Cole-Zaiser site. The preferred remedy calls for the use of ex-situ soil vapor extraction to address volatile organic contamination present in site soils.

The release of the PRAP was announced via a notice to the mailing list, informing the public of the PRAP's availability.

A public meeting was held on September 17, 1998 which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. Written comments were received from Mr. Duane Romig, which have become part of the Administrative Record for this site.

The public comment period for the PRAP was to have ended on October 6, 1998. However, the comment period was extended to October 17, 1998 due to a typographical error in the PRAP. The comment period officially closed on October 17, 1998.

This Responsiveness Summary responds to all questions and comments raised at the September 17, 1998 public meeting and to the written comments received.

The following comments were received at the September 17, 1998 public meeting.

COMMENT 1: The State's preferred remedy specifies the replacement of my drinking water well. When will my well be replaced? Will I have to wait until after the soil is treated, in a couple of years? How will the well be installed? I would like it replaced as soon as possible.

RESPONSE 1: Based on discussions with one of the PRPs (Borg-Warner), the impacted, off site well should be replaced in the Spring of 1999. The NYSDEC has worked with Borg-Warner Automotive to complete the investigation and feasibility study for the site. Although no agreement is currently in place for the cleanup of the site, Borg-Warner has expressed a willingness to carry out that work. They have also indicated that they will install the replacement well prior to the treatment of the soil, once an Order on Consent with the NYSDEC has been signed. The well will be drilled in an area not impacted by site contaminants.

COMMENT 2: I live in the house with the impacted well. The State currently maintains a filter on my well, but the water is still dirty. If I pour a glass of water and let it sit, an oil film appears on the surface. Is the water alright to drink?

RESPONSE 2: The NYSDEC currently maintains your water filter. As part of that maintenance, the well is sampled semi-annually. Samples collected before and after the treatment unit show that site-related contaminants (chlorinated solvents) are being removed from your drinking water. Your shallow, dug well may contain iron bacteria, which can produce a sheen which looks similar to a gasoline sheen. Iron bacteria is not associated with the hazardous waste disposal at the Cole-Zaiser site, but is naturally occurring. This bacteria is not a health concern but does represent an aesthetic problem.

COMMENT 3: Were soil samples from the property with the impacted well tested?

RESPONSE 3: No soil samples were collected from the impacted property, since there has not been any indication of surface transport or offsite disposal of hazardous waste northeast (towards the off site, impacted property) of the Cole-Zaiser site. Although the drinking water well is contaminated, this contamination has been caused by the transport of chlorinated solvents in groundwater.

COMMENT 4: Who owns the site?

RESPONSE 4: The property is currently owned by Ms. Dorothy Lowe.

COMMENT 5: Will Borg-Warner buy the site?

RESPONSE 5: Borg-Warner Automotive has not indicated an intent to purchase the Cole-Zaiser site. While the selected remedy does not require purchase of the property, an agreement will have to be reached with the property owner to place deed restrictions on the property. The deed restrictions, if enacted, will prohibit activities in areas of contaminated groundwater until contaminants have attenuated to below drinking water standards.

COMMENT 6: I own property surrounding three sides of the site. What are the possible impacts to my property?

RESPONSE 6: The property in question is located south of the site. Based on the data collected during the remedial investigation, this property was not impacted by contaminant migration from the site. Historically, there was report of a spill running downhill a distance of 300 feet to the south of the site. However, results from the soil gas survey, geoprobe groundwater survey, surface soil sampling program, soil boring program, and monitoring well sampling did not indicate contaminants were present in this area at levels of concern. The identified areas of concern at the site are an isolated area of subsurface soil contamination in the former lagoon/bermed area and the shallow groundwater migrating from this source area. The shallow groundwater flows northeast, across Little Pond Road. Volatiles and petroleum products will biodegrade and/or volatilize when present in shallow soil, which likely explains why residuals from the 300 foot spill are no longer detectable.

COMMENT 7: I live near the site. Will someone sample my well? (Asked by two property owners)

RESPONSE 7: Both properties are located south of the site, which is upgradient of the subsurface soil and groundwater contamination. As stated above, data collected during the remedial investigation indicate that groundwater contamination is not moving in this direction.

One of the wells in question was sampled in 1992 and no site related contaminants were identified. That well, therefore, will not be sampled. The other well was sampled by the Oswego County Health Department. The results of this sampling is discussed under Comment 15.

COMMENT 8: Will there be any runoff from the treatment system that can affect our health?

RESPONSE 8: The treatment system, which is described in detail in the Record of Decision, is a closed system. As such, there will be no runoff from contaminated soil. Air discharges from the treatment system will be monitored, and initially treated. Treatment will continue as necessary, to insure that no compounds are released that would pose a threat to human health or the environment.

COMMENT 9: Will the treatment unit work in the winter?

RESPONSE 9: Although the treatment unit can be expected to run more efficiently in the warmer months, ex-situ soil vapor extraction has been successful year round in the northeast. A similar system was successfully operated in nearby Clay, NY.

COMMENT 10: How long will it take to complete the cleanup?

RESPONSE 10: Once the treatment system is constructed, soil treatment should continue for approximately one year, and be completed. A groundwater monitoring program will continue until contaminants attenuate to below groundwater standards. Once groundwater contaminants are below drinking water standards, the site will be considered for removal from the New York State List of Inactive Hazardous Waste Disposal Sites.

COMMENT 11: What if I want to put a house in the area of the groundwater contamination?

RESPONSE 11: Two properties have been impacted by the Cole-Zaiser site. The remedy calls for the placement of deed restrictions on these two properties which will prohibit activities that could cause a contaminant-related risk to human health or the environment. The construction of a house in a contaminated area would depend on exactly where the house was built and other details of construction. This could be decided on a case-by-case basis by the NYSDEC and NYSDOH, unless otherwise addressed in the deed restrictions.

COMMENT 12: How much is this site costing New York State?

RESPONSE 12: The NYSDEC and NYSDOH have spent approximately $140,000 on the Cole-Zaiser site. This amount includes conducting investigations, maintaining the residential water treatment system, and overseeing the work performed by Borg-Warner Automotive. Borg-Warner Automotive, Inc., in their Order on Consent with the NYSDEC, agreed to pay the State's costs associated with the Remedial Investigation and Feasibility Study (RI/FS). Costs incurred prior to the RI/FS was funded by the 1984 Environmental Quality Bond Act (New York State Superfund). It is expected that recovery of this money will be the subject of negotiations with the Potentially Responsible Parties (PRPs) in the future.

COMMENT 13: Do you know how this site came about? A guy had a farm right next door and his cow came down to the spring to drink. The cows ended up getting sick, so the State was notified. The State didn't do anything. Everybody in the neighborhood knew they were dumping oil into a pool and on top of the ground.

RESPONSE 13: The NYSDEC was informed by Mr. William Trumble in 1996 that cows in a nearby field had allegedly become sick in the past, and this was attributed to the site by the owner of the cows. The Cole-Zaiser site first officially came to the attention of the NYSDEC when they were fined in April 1976 for violating Section 270301 of the Environmental Conservation Law after a large spill. No further action was undertaken by the NYSDEC once the site ceased operation in 1977 since the Department had no authority to properly investigate hazardous waste sites at the time. This authority and funding were provided in 1984 by the Environmental Quality Bond Act.

COMMENT 14: I looked at analytical data I received for my well. For every contaminant analyzed for, the data showed a concentration of "1 ug/l U." How could the concentration be the same for every compound?

RESPONSE 14: When a laboratory analyzes a sample there is a certain concentration, called a detection limit, below which they cannot confidently determine the quantity of a chemical in that sample. This detection limit depends on the laboratory method used, the nature of the sample, and other factors. When laboratory results are reported, they generally report compounds not detected as "non-detect," which is designated by the detection limit followed by the letter "U." When you saw "1 ug/l U" for all compounds, that meant that the laboratory did not detect any contaminants, but that they could only detect concentrations greater than 1 ug/l. Since the allowable concentrations of these contaminants in drinking water is greater than 1 ug/l for the contaminants of concern, these detection limits were adequate. In other words, the contaminants may or may not be in the sample, but the laboratory could not detect them and they were not in the sample at a concentration greater than 1 ug/l.

The following comments were received in a September 23, 1998 letter from Mr. Duane E. Romig.

COMMENT 15: I attended the meeting regarding the Cole-Zaiser spill site located on Little Pond Road in Amboy, NY. I have also reviewed material regarding the spill and the proposed remedial action. Per your information on page 3, the 300 foot spill from the lagoon traveled south and southeast. That is the location of an underground spring and my dug well. As stated in the meeting, I believe that it is critical to the health of our families to insure that the water wells are tested in insure that they are not contaminated.

RESPONSE 15: At the request of Mr. Romig, the Oswego County Health Department sampled his newly constructed dug well on October 13, 1998. The well contained the following contaminants: toluene (80 ppb), ethylbenzene (0.8 ppb), sec-butylbenzene (0.5 ppb), and 4-isopropyltoluene (15 ppb). Each of these contaminants are constituents of gasoline, diesel fuel, and other common petroleum products. The maximum contaminants level in drinking water for these compounds is 5 ppb.

On November 4, 1998, representatives from the NYSDEC, NYSDOH, and Oswego County Health Department met with Mr. Romig to evaluate potential sources of contamination for his well. No signs of dumping were evident to casual observation and Mr. Romig stated that nobody had been in the area in years, with the exception of the contractor who installed his well. It was noted, however, that the fields are mowed with a gasoline powered farm tractor (circa 1950's) and there has been some logging in the area.

Transport of contaminants from the Cole-Zaiser site is unlikely. If it occurred, the only possible mechanisms of transport are surface drainage and shallow groundwater. The first mechanism, surface drainage from the site, does not appear to be a potential pathway. Based on field observations, the topography of the area would have carried any spills from Cole-Zaiser southeast, away from Mr. Romig's new well. To reach Mr. Romig's well directly, contaminants would have had to flow uphill rather than the prevailing downhill direction. Although surface drainage eventually leads to the same wet area that Mr. Romig uses as a water source, contaminants would have reached the swale at a point down gradient from his well location and would not have impacted the groundwater upgradient. The direction of spills (away from Mr. Romig's well) was confirmed by Mr. Comstock, who lived in the area during the operation of Cole-Zaiser. Based on topography, the eye witness account of Mr. Comstock, and the known history of the site; contamination should not have reached the area of the new well through surface runoff.

The other possible route of contaminant transport is by shallow groundwater. Monitoring wells installed on the site indicate shallow groundwater flows to the east and northeast; very closely following surface topography. It is possible that the most highly contaminated well (MW-7) is located on a groundwater divide, allowing contamination to also flow southeast from the source. However, topography indicates that even of contaminated groundwater were to flow in this direction, it should not have impacted Mr. Romig's well since it would reach the swale down gradient of the well location. Therefore, it does not appear that shallow groundwater could have transported contaminants to Mr. Romig's well.

During the Remedial Investigation, six soil gas samples and one Geoprobe groundwater sample were collected between the known source of contamination and Mr. Romig's well. None of the contaminants detected in Mr. Romig's well were detected in any of the samples. The contaminants of concern for the site (chlorinated solvents) were not detected in Mr. Romig's well. While toluene was detected in Mr. Romig's well at a concentration of 80 ppb, the highest concentration of toluene in groundwater found on site was 47 ppb. Therefore, the groundwater chemistry does not support the argument that Cole-Zaiser is the source of contamination in Mr. Romig's well.

The contaminants found in Mr. Romig's well are constituents in many common petroleum products; including gasoline, fuel oil, and diesel fuel. The concentrations detected, while above drinking water standards in some cases, are low and could have resulted from sources other than the site. Although the source of contamination in Mr. Romig's well has not yet been identified, based on the existing analytical data and our evaluation of the transport mechanisms, this contamination does not appear to be related to the Cole-Zaiser site. The Oswego County DOH has resampled the well to verify the results of the first round of sampling. The County and State will continue to work with Mr. Romig to identify the source of contamination in his well.

COMMENT 16: Your proposed action plan 2B, gives me great concern for the health and safety of the neighborhood families. As you stated in the meeting, the time frame to complete would be approximately 2 years and possibly longer based on how quickly the contamination reacts to the remedy. My second concern is the fact that this will be taking place in my backyard in the proximity of my house, airborne contaminants as well as the possibility of spreading contaminants on my property. I also would not like to be looking our my front window at this huge black mound. My property line is only approximately 60-70 from the main building. The south side of the contaminated area that contains the highest levels in your test wells, is adjacent to my backyard.

After reviewing all the material, the best alternative to choose for the health and safety of the families in the neighborhood would be alternative number 3, off site disposal. While it costs more, it can be implemented in 3-6 months and completed sooner than 2B reducing the health risk significantly. Then the contaminated soil can be treated at a hazardous waste site with reduced risk to the public.

RESPONSE 16: In its current state, the primary human health risk attributable to the Cole-Zaiser site is the drinking of contaminated groundwater. The only property with an impacted drinking water well currently has a treatment system that removes site contaminants. Therefore, the current risk to the health and safety of the neighborhood families caused by the site has been mitigated. The recommended remedy will remove the contaminated soil and place it in a lined, sealed treatment system. The only planned release from the treatment system will be through air emissions. Air emissions from the treatment unit will be treated initially. Air monitoring will determine whether or not this treatment should be continued throughout the operation of the soil vapor extraction system, based on air quality criteria. Therefore, there should be no additional health risks posed by airborne contaminants.

The NYSDEC evaluates alternatives based on eight criteria, including:

Compliance with New York State Standards, Criteria, and Guidance.
Protection of Human Health and the Environment
Short-term Effectiveness
Long-term Effectiveness and Permanence
Reduction of Toxicity, Mobility, or Volume
Implementability
Cost
Community Acceptance

This evaluation, which is presented in the Record of Decision and the Feasibility Study, determined that alternative 2B (Ex-situ soil vapor extraction) is the most appropriate.

The alternative you identified, offsite disposal, was rejected for the following reasons:

- When compared to the selected remedy, it does not provide any improved compliance of NYS standards, criteria, and guidance; offers no additional protection to human health or the environment; and is no more effective or permanent in the long term. On site soil would be cleaned up to the same criteria in both remedies.

- When compared to the selected remedy, it is less effective in the short term. Contaminated soil would have to be transported over public highways to a remote location for disposal. The selected remedy treats soil on site, thereby never risking an impact to the off site public. The selected remedy creates a slight increase in risk due to air emissions, however, air emissions will be treated initially, and monitored throughout the life of the treatment system to mitigate that risk.

- The NYSDEC gives preference to remedies which permanently and significantly reduce the toxicity, mobility, or volume of wastes at a site. Off site disposal does not reduce the toxicity or volume of the contaminants since contaminated soil would just be transported from one location to another. The selected remedy will reduce the volume and toxicity of the soil by treating it to below cleanup standards.

- Off site disposal is well over double the cost when compared to the selected remedy
($ 1,351,500 vs. $ 554,300).

- There has been a general acceptance of the selected remedy by the public at the public meeting.

- Although offsite disposal is easier to implement (soil is just dug up and hauled away), the added effort to implement the selected remedy is not prohibitive.

The only disadvantages to the selected remedy are that it would take longer to implement and nearby residents would have to look at a "huge black mound" during soil treatment. Although temporarily aesthetically unpleasing, this disadvantage does not outweigh the benefits of the selected remedy.

APPENDIX B

Administrative Record

ADMINISTRATIVE RECORD

for the
Record of Decision

Cole-Zaiser Site
Amboy (T), Oswego County
Site No. 7-38-013

The following documents constitute the Administrative Record for the Cole-Zaiser Inactive Hazardous Waste Disposal Site Record of Decision.

Documents

Phase I Investigation, Cole-Zaiser Site (Site No. 7-38-013), URS Company, June 1989.

Phase II Investigation, Cole-Zaiser Site (Site No. 7-38-013), URS Consultants, November 1992.

Phase II Investigation, Supporting Documentation, Cole-Zaiser Site (Site No. 7-38-013), URS Consultants, November 1992.

Remedial Investigation (RI) Work Plan, Cole-Zaiser Site (Site No. 7-38-013), Woodward-Clyde Consultants, August 1995.

Remedial Investigation Sampling and Analysis Plan (SAP), Cole-Zaiser Site (Site No. 7-38-013), Woodward-Clyde Consultants, July 1996.

Citizen Participation Plan, Cole-Zaiser Site (Site No. 7-38-013), Woodward-Clyde Consultants, July 1996.

Remedial Investigation, Cole-Zaiser Site (Site No. 7-38-013), Vol. 1 and 2, Woodward-Clyde Consultants, March 1998.

Focused Feasibility Study Report, Cole-Zaiser Site (Site No. 7-38-013), Woodward-Clyde Consultants, September 1998.

Proposed Remedial Action Plan (PRAP) Comments

Letter dated September 23, 1998 from Mr. Duane E. Romig to Jeffrey Edwards of the NYSDEC