Technology Section EOU Site

Department of Environmental Conservation

Division of Hazardous Waste Remediation

Roehlen Engraving Inactive Hazardous Waste Site

Site Number 8-28-077
Town of Henrietta
Monroe County, New York

Record of Decision

March 1994

New York State Department of Environmental Conservation
MARIO M. CUOMO, *Governor* LANGDON MARSH, *Acting Commissioner*

Jane H. C. Goddard
RESIGNED

Inactive Hazardous Waste Site
ROD - Summary Sheet

Site: 8-28-077
Name: Roehlen Engraving
Location: Town of Henrietta, Monroe County
Prepared by: Todd M. Caffoe, Environmental Engineer I - Region 8

* MEETING W/ ANN. D
11:00 A.M 3/25/94

DESCRIPTION OF PROBLEM:

Roehlen Engraving is a manufacturer of specialty engraved steel plates and rolls which are used by various industries to produce textured surfaces on their products. The facility is located in a light industrial/commercial area, and it is within one-half mile of several major shopping centers. The area around the facility is serviced by a public water supply and the nearest residential area is an apartment complex which is located approximately three-quarters of a mile to the south.

In 1988 and 1989, Roehlen Engraving voluntarily performed two investigations involving the installation of 11 groundwater monitoring wells and 8 soil borings in the chrome plating area of their facility. These investigations showed that on-site soil and groundwater in the plating area were contaminated with chromium, lead, and chlorinated solvents. The suspected source of the contamination was spillage of unknown quantities of plating solutions and solvents from past operations. Based upon this information, the site was added to the Registry as a class 2 in 1989. Roehlen Engraving voluntarily performed a records search and prepared an Historical Site-Usage Report in 1990. This report identified additional potential source areas of contamination due to past waste disposal practices.

The Remedial Investigation (RI) focused upon all suspected source areas, and it was completed in December 1993. The results of the RI confirmed that groundwater was contaminated with chromium, lead, and chlorinated solvents in excess of NYSDEC groundwater standards. The extent of groundwater contamination appears limited to the area underneath and adjacent to the plating area of the manufacturing building, and contamination has not been detected leaving the Roehlen Engraving property. Also, subsurface soils were contaminated with lead, chromium and low levels of chlorinated solvents. The extent of soil contamination appears limited to the suspected source areas located on the Roehlen Engraving property.

DESCRIPTION OF REMEDY:

Based upon the findings of the RI/FS, the selected remedial alternative will involve excavation of contaminated soils outside and adjacent to the manufacturing building, and off-site disposal of excavated soils at a permitted facility. The excavations will not extend below the water table (approximately 5 feet), and they will be backfilled with clean soils to original grade. Contaminated soils beneath the plating area of the building will remain in place because it is not technically feasible to remove the soils without demolition of the building. The ongoing operations at the facility could not sustain an extended suspension of use of the chrome plating area. Contaminated groundwater will be recovered and treated on-site in the facility's existing wastewater treatment system. The treated groundwater will be discharged to a 100 MGD publicly-owned treatment works. The groundwater recovery system will be operated until contaminant levels reach asymptotic conditions. If the groundwater RAOs are not achieved after asymptotic conditions are reached, then Roehlen Engraving will perform a focused feasibility study to evaluate enhancements to the recovery system.

COST:

The present worth of the selected remedy is $ 507,000, and the approximate capital cost is $ 244,000.

ISSUES:

There are no anticipated issues which would effect the implementation of the selected remedy. Both NYSDOH and the Monroe County Health Department are supportive of the remedy. Roehlen Engraving is willing to fund the remedy and have expressed a willingness to begin negotiations for the RD/RA consent order. There were no comments received from the public during the 30-day comment period.

DECLARATION STATEMENT - RECORD OF DECISION

Roehlen Engraving
Town of Henrietta, Monroe County, New York
Site No. 8-28-077

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Roehlen Engraving 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 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Roehlen Engraving Inactive Hazardous Waste Site and upon the Proposed Remedial Action Plan (PRAP) presented to the public by the NYSDEC. There were no comments received from the public during the 30-day comment period. A bibliography of the documents included as a part of the Administrative Record is included in Appendix A 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 threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Roehlen Engraving site and the criteria identified for evaluation of alternatives, the NYSDEC has selected excavation and off-site disposal of contaminated soils, and groundwater recovery and on-site treatment. The components of the remedy are as follows:

- Excavation of vadose zone chromium contaminated soils to 35 ppm cleanup level;
- Off-site disposal of chromium contaminated soils at a permitted facility;
- Design and installation of a groundwater recovery system;
- Evaluate the effectiveness of the existing wastewater treatment system to treat recovered groundwater; and
- Long-term groundwater monitoring.

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 statutory preference for remedies that reduce toxicity, mobility, or volume as a principal element.

If the remedial action objectives (RAOs) for groundwater cannot be achieved, a focused Feasibility Study will be performed to evaluate the need for system enhancements or no further action. Since a portion of the chromium contaminated soils will remain in place, long-term monitoring of the groundwater will be required.

Date

Ann Hill DeBarbieri
Deputy Commissioner

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RECORD OF DECISION

Roehlen Engraving

Town of Henrietta
Monroe County, New York
Site No. 8-28-077
March 1994

SECTION 1: SITE LOCATION AND DESCRIPTION

Roehlen Engraving is an active 83,000 sq. ft. manufacturing facility located at 701 Jefferson Road in the Town of Henrietta, Monroe County, and it has been in operation since 1960. The area around the facility is served by public water and is predominantly a light industrial/commercial area. The facility is within one-half mile of several major shopping centers, and the nearest residential area is an apartment complex which is located approximately 3300 feet to the south. Please refer to *Figure 1* for the general site location.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

The facility manufactures specialty engraved steel plates and rolls which are used by various industries to produce textured surfaces on their products. The engraving process uses dilute solutions of nitric acid and ferric chloride. Most of the engraved plates and rolls are chrome plated to harden the surface of the patterns.

Currently, all process wastewater is treated on-site, and it is subsequently discharged under a sewer use permit to the Town of Henrietta sanitary sewer system. Sludges are de-watered and manifested off-site as an F006 hazardous waste.

2.2 Remedial History

In 1988 and 1989 Roehlen Engraving voluntarily performed two investigations which involved the installation of 11 groundwater monitoring wells and 8 soil borings in the chrome plating area of their facility. The investigations concluded that the soils and the groundwater in the plating area were contaminated with chromium and chlorinated solvents. Soils beneath the plating room floor failed hazardous waste characteristics for hexavalent chromium, and the groundwater contained levels of hexavalent chromium, lead, and trichloroethylene (TCE) greater than groundwater standards. The suspected source of the contamination was spillage of unknown quantities of plating solutions from past operations. Based upon this information, the site was added to the Registry of Inactive Hazardous Waste Sites in New York State with a classification of 2 in 1989. A class 2 means the site poses a significant threat to the public health or environment and action is required.

To minimize the threat of further contamination, Roehlen Engraving modified the plating room to minimize spillage of plating solutions. Any inadvertently spilled fluids are pumped into the facility's wastewater system for treatment and discharge to the sanitary sewer.

Roehlen Engraving voluntarily performed a records search and prepared a report in 1990. This report identified potential source areas of contamination due to past waste disposal practices.

SECTION 3: CURRENT STATUS

Pursuant to an Order on Consent, which became effective in April 1991, Roehlen Engraving initiated a Remedial Investigation/ Feasibility Study (RI/FS) in May of 1991 to address contamination at the site. The purpose of the remedial investigation (RI) was to define the nature and extent of any contamination resulting from previous activities at the site.

3.1: Summary of the Remedial Investigation

The RI was conducted over a 30-month period. A report entitled "Remedial Investigation" (February 1994) has been prepared describing the field activities and findings of the RI in detail. A summary of the RI activities includes:

- *Geophysical survey to determine the locations of potential source areas;*
- *Surface and sub-surface soil sampling and analysis to determine chemical and physical properties of known and potential source areas;*
- *Installation of monitoring wells for chemical analysis of groundwater and assessment of hydrogeologic conditions;*
- *Health Based Risk Assessment; and*
- *Ecological Assessment.*

The RI focused upon several known and potential source areas of contamination. The potential source areas were identified to the Department by Roehlen Engraving in a document entitled "Historical Site-Usage Report." The plating area was previously identified as a source of contamination during independent investigations performed by Roehlen Engraving. The known and potential source areas are summarized below. Please refer to *Figure 2* for the location of each area.

Bentonite Pit Area: *A bentonite lined disposal pit approximately 15' x 15' was used in 1975 for the one-time disposal of plating wastes. This area is currently underneath the existing employee parking lot.*

Closed-End Storm Water Diversion Ditch Area: *This ditch received stormwater runoff and was reportedly used for disposal of plating wastes. In 1975, sediments in the ditch were excavated and disposed on-site in the bentonite pit area. The ditch was backfilled and its former location is underneath the existing employee parking lot.*

Temporary Holding Lagoon Area: *In 1968, a temporary holding lagoon was used to treat wastewater from the facility while a wastewater treatment system was being constructed inside the facility. The lagoon was reportedly used for one year and was removed and backfilled in 1969. The area is currently part of the lawn on the east side of the Roehlen Engraving property.*

Manway Area: *This was an underground concrete vault reportedly used to store untreated wastewaters during the 1960s. It was located in what is now the front lawn area of the Roehlen Engraving property.*

Plating Area: *This portion of the facility is the location of the chrome plating operations, and it includes the containment area. The investigations performed by Roehlen Engraving in 1988 and 1989 identified this area as a source of soil and groundwater contamination.*

The results of the RI identified that groundwater was contaminated with chromium, lead, zinc, silver, vinyl chloride, trichloroethylene (TCE), and 1,2-dichloroethylene in excess of NYSDEC 6NYCRR Part 703 groundwater standards. The extent of groundwater contamination appears limited to the plating area. Monitoring wells in the vicinity of the plating area exceeded groundwater standards. Please refer to *Tables 1 and 2* for a summary of groundwater quality data and *Figures 3 and 4* for well locations.

Soils analyses concluded that contamination was primarily with lead and chromium. There were also low levels of TCE ranging from 10 to 220 ppb in the plating area soils. The majority of the soil contamination is in the vicinity of the plating area;

however, chromium contamination was detected in one sample from the bentonite pit area (SS-27 @ 79 ppm), one sample from the manway area (SS-34 @ 81 ppm), and one sample from the closed-end storm water diversion ditch area (SS-30 @ 37 ppm). Elevated levels of lead were only detected in the plating area soils. Please refer to *Figure 5* for sampling locations and a summary of total chromium concentrations in the soils for each potential source area.

The analytical data obtained from the RI was compared to NYS Applicable Standards, Criteria, and Guidance (SCGs) in determining remedial alternatives. Groundwater, drinking water and surface water SCGs identified for the Roehlen Engraving site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. For the evaluation and interpretation of soil and sediment analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used to develop remediation goals for soil.

Based upon results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure rates, certain areas and media of the site require remediation.

3.2 Summary of Human Exposure Pathways:

The RI included an evaluation of human health risks, both current and probable future scenarios, that are posed by the contamination at the site. The health risk assessment evaluates the analytical results from various media (air, soils and groundwater) and identifies how the general public can possibly be exposed to the contamination. The results of the risk assessment are found in a report entitled "Baseline Risk Assessment" (November 1993).

The data from the RI indicated that contaminated soils are present underneath the manufacturing building, below the surface of the parking lot, and below the surface outside the building adjacent to the plating area. Groundwater contamination appears limited to the vicinity of the chrome plating area on the Roehlen Engraving property. The area is served by a public water supply.

The risk assessment evaluated present and future land uses where exposure to contaminated soils and groundwater is likely. For the present land usage, potential human exposure was evaluated for an underground utility worker in the contaminated areas. For future land use, potential human exposure was evaluated for use as a residential area.

Many factors were considered during the development of the risk assessment. These factors include: EPA guidance; permanence of the remedy; future use of the site; and compliance with New York State SCGs. Based upon the results of the RI, contaminant levels in the groundwater and soil exceeded NYS groundwater standards and the soil cleanup criteria. If a remedial action is not implemented at the site, there would be a potential threat to the public health and environment.

3.3 Summary of Environmental Exposure Pathways:

The site is located in a highly commercial setting which lacks significant wildlife habitat. Further, the extent of contamination is limited to soils and groundwater below the surface of the Roehlen Engraving property. As such, the RI concluded there are no significant environmental exposure pathways at risk from contamination identified at this site.

SECTION 4: ENFORCEMENT STATUS

The NYSDEC and Roehlen Engraving entered into a Consent Order on April 25, 1991. The Consent Order obligates Roehlen Engraving to implement a Remedial Investigation/Feasibility Study. Upon issuance of the Record of Decision (ROD) the NYSDEC will initiate negotiations with Roehlen Engraving to implement the selected remedy under another Order on Consent. The ROD is the final decision for the cleanup of the site.

The following is the chronological enforcement history of this site:

Date	Index No.	Subject of Order
4/91	B8-0247-88-12	RI/FS

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6NYCRR 375-1.10. These goals are established under the guideline of meeting all standard, criteria, and guidance (SCGs) and protecting 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 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 the contamination present within the soils and groundwater on site;
- Prevent, to the extent possible, migration of contaminants;
- Mitigate the impacts of contaminated groundwater to the environment and provide attainment of SCGs for groundwater to the extent technically practicable;
- Provide for attainment of SCGs for soil which is protective of groundwater quality at the limits of the area of concern to the extent practicable; and
- The Remedial Action Objectives (RAOs) are presented in *Tables 3 and 4*.

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the Roehlen Engraving site were identified, screened and evaluated in a two-phase Feasibility Study. This evaluation is presented in the report entitled "Feasibility Study" February 1994. A summary of the detailed analysis follows.

6.1: Description of Alternatives

The potential remedies were evaluated to address the contaminated soils and groundwater at the site.

Alternative 1 - No Action

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It would require continued monitoring only, allowing the site to remain in an unremediated state.

This would be an unacceptable alternative as the site would remain in its present condition, and human health and the environment would not be adequately protected.

Alternative 2 - Institutional Action

This alternative would involve long-term groundwater monitoring and site use/access restrictions (including deed restrictions). A permanent fence and hazard signs would be erected around the areas of concern.

Present Worth:	$ 256,000
Capital Cost:	$ 77,000
Annual O&M:	$ 19,000
Time to Implement	1 year

Alternative 3 - Groundwater Pump and Treatment and Asphalt Cap

This alternative would involve placement of approximately 100 square yards of asphalt over the bentonite pit area and groundwater recovery and treatment at the facility's existing wastewater

treatment system. Groundwater recovery operations would continue until asymptotic conditions are achieved.

Present Worth:	$ 615,000
Capital Cost:	$ 31,000
Annual O&M:	$ 62,000
Time to Implement	1 year

Alternative 4 - Groundwater Pump and Treatment and Enhanced Asphalt Cap

This alternative is the same as alternative 3 except the area of the asphalt cap would be expanded to 600 square yards which would include the area outside and adjacent to the plating area of manufacturing building.

Present Worth:	$ 745,000
Capital Cost:	$ 47,000
Annual O&M:	$ 74,000
Time to Implement	1 year

Alternative 5 - Groundwater Pump and Treatment, In-situ Treatment of Soils, and Capping

This alternative would involve the in-situ solidification of contaminated soils outside of the building, and the placement of a soil cap over and around the treated soils (600 square yards). An asphalt cap (100 square yards) would be placed over the bentonite pit area and groundwater recovery and treatment would be included with this alternative. Groundwater recovery operations would continue until asymptotic conditions are achieved.

Present Worth:	$ 892,000
Capital Cost:	$ 318,000
Annual O&M:	$ 83,000
Time to Implement	1 year

Alternative 6 - Groundwater Pump and Treatment, Ex-situ Treatment of Soils, and Capping

This alternative would involve excavating 1,478 cubic yards of contaminated soils outside of the manufacturing building, treatment with a reducing agent, and replacement of treated soils. Excavation would not extend below the water table (5 feet) in order to minimize the threat of mobilizing contaminated groundwater. The treated area and a portion of the surrounding area (600 square yards) would be covered with a soil cap. Groundwater recovery and treatment, and an asphalt cap over the bentonite pit would be included with this alternative. Groundwater recovery operations would continue until asymptotic conditions are achieved.

Present Worth:	$ 653,000
Capital Cost:	$ 79,000
Annual O&M:	$ 83,000
Time to Implement	1 year

Alternative 7 - Asphalt Capping and Dual-Phase Vacuum Extraction

This alternative would involve placement of an asphalt cap over the contaminated soils adjacent to the building and in the bentonite pit (600 square yards). Groundwater and soil vapor would be extracted using a dual-phase vacuum extraction system and treated on-site for a period of five years.

Present Worth:	$ 1,292,000
Capital Cost:	$ 140,000
Annual O&M:	$ 249,000
Time to Implement	1 year

Alternative 8 - Soil Excavation and Off-Site Disposal, Groundwater Pump and Treatment

This alternative would involve excavating 1,478 cubic yards of contaminated soils outside the manufacturing building and off-site disposal at a permitted facility. Excavation would not extend below the water table (5 feet) in order to minimize the threat of mobilizing contaminated groundwater. The excavation would be backfilled with clean soils and restored to pre-remedial appearance. Groundwater recovery and treatment would be included with this alternative. Groundwater recovery operations would continue until asymptotic conditions are achieved.

Present Worth:	$ 507,000

Capital Cost:	$ 244,000
Annual O&M:	$ 50,000
Time to Implement	1 year

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 contained 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.

Alternatives #1 and #2 do not address groundwater contamination, nor would they address the soil cleanup goals. *Alternatives #3 and #4* address groundwater contamination; however, soil cleanup goals would not be addressed. The *remaining alternatives* meet this criterion.

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.

Alternatives #1 and #2 would partially meet this criterion because they would address the soil contamination but not the groundwater contamination. The *remaining alternatives* would meet this criterion.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each remedial strategy.

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 implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared with the other alternatives.

Alternatives #1, #2, and #3 would meet this criterion. The *remaining alternatives* would have minimal short-term impacts from potential fugitive emissions during soil excavation.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of alternatives after implementation of the response actions. 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.

Alternatives #1 and #2 would not meet this criterion. *Alternatives #3, #4, and #7* would not meet this criterion because over 25% of the wastes on-site would be left untreated. *Alternatives #5, #6, and #8* would meet this criterion.

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.

Alternatives #1 and #2 would not meet this criterion. *Alternatives #3, #4, and #7* would reduce the mobility of the contaminants. A portion of the toxicity and volume of the contaminants would be addressed by the groundwater collection and treatment. *Alternatives #5, #6, and #8* would reduce the mobility and would significantly reduce the volume and toxicity of contamination by soil excavation and groundwater collection and treatment.

6. Implementability. The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personal and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

All alternatives could be implemented within one year. *Alternatives #5 and #6* would be the most difficult to implement because of uncertainties involved with in-situ treatment (#5) and the materials handling and for ex-situ treatment (#6). *Alternatives #1 and #2* would be most easily implemented. The *remaining alternatives* would require material handling operation but would not be difficult to implement.

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 5*.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused on after public comments on the PRAP.

8. Community Acceptance - A fact sheet was distributed to the media and the interested public on February 23, 1994. A public meeting was held on March 3, 1994. Public comments were encouraged both at the public meeting and by the fact sheet. Although opportunities were provided, no comments were received during the 30-day public comment period.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC has selected *Alternative 8* as the remedy for this site.

This selection is based upon the following:

Alternatives #1 and #2 do not meet the threshold criteria. *Alternatives #3 and #4* address groundwater contamination, but they do not address soil cleanup goals. *Alternatives #5 and #6* address soil and groundwater contamination but there are problems with implementability. Alternative #7 offers some enhanced recovery of volatile organic contaminants, but will not enhance remediation of metals contamination. The increased recovery of volatile organic contaminants provides for little extra environmental benefit for the cost. *Alternative #8* which involves excavation and off-site disposal of contaminated soil and groundwater recovery and treatment is the most appropriate choice.

The estimated present worth cost to implement the remedy is $ 507,000. The cost to construct the remedy is estimated to be $ 244,000 and the estimated average annual operation and maintenance cost is $ 50,000.

7.1 Elements of the Selected Remedy

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

The proposed remedial action includes the following:

1. Remedial Design

- A pre-design soil sampling investigation will be conducted by Roehlen Engraving to determine the vertical and horizontal extent of contaminated soil exceeding the cleanup goal;
- A pre-design pump test will be initiated in the plating area to gather data for the number of recovery wells, groundwater

recovery rates, and well placement. It is anticipated the groundwater recovery rate will not exceed 500 gallons per day;

- The groundwater collected from the pre-design pump test will be batch treated in the facility's existing wastewater treatment system and tested after treatment to determine treatment effectiveness. If the treatment system does not meet the requirements for discharge to the Town of Henrietta sewer system, modifications to the treatment system will be incorporated into the remedial design;

2. Soil Remediation

- Excavation of approximately 1,478 cubic yards of soil outside the building and in the bentonite pit area. Excavated soils will be disposed off-site at a permitted facility. Soil excavation near the manufacturing building will not proceed below the water table, nor will it compromise the integrity of the building. Soils beneath the building will not be excavated because it is not feasible to remove them without demolition of the manufacturing building which would result in an extensive plant shutdown. The ongoing operations at the facility could not sustain an extended suspension of the use of the plating room because of revenue losses. Soil excavations near the building will be backfilled with clean soil, graded and seeded. After excavation of the bentonite pit, it will be backfilled with clean soil and paved with asphalt to the original grade of the parking lot;

3. Groundwater Remediation

- The Remedial Action Objectives (RAOs) for groundwater contaminants are the 6NYCRR Part 703 standards. The Department recognizes that groundwater in the upper water bearing zone is not currently used for either industrial or potable purposes. Therefore, the groundwater recovery and treatment system will be operated until it is determined that contaminant levels in the groundwater have reached asymptotic conditions. The evaluation criteria for determining asymptotic conditions will be established during the remedial design.

  If it is determined that the levels of contaminants in the groundwater have reached asymptotic conditions, but the RAOs for groundwater are not obtained, then a focused FS will be conducted by Roehlen Engraving to evaluate the necessity of further groundwater remediation. The focused FS will include but not be limited to, no further action, enhancement of the existing collection system, and institutional controls.

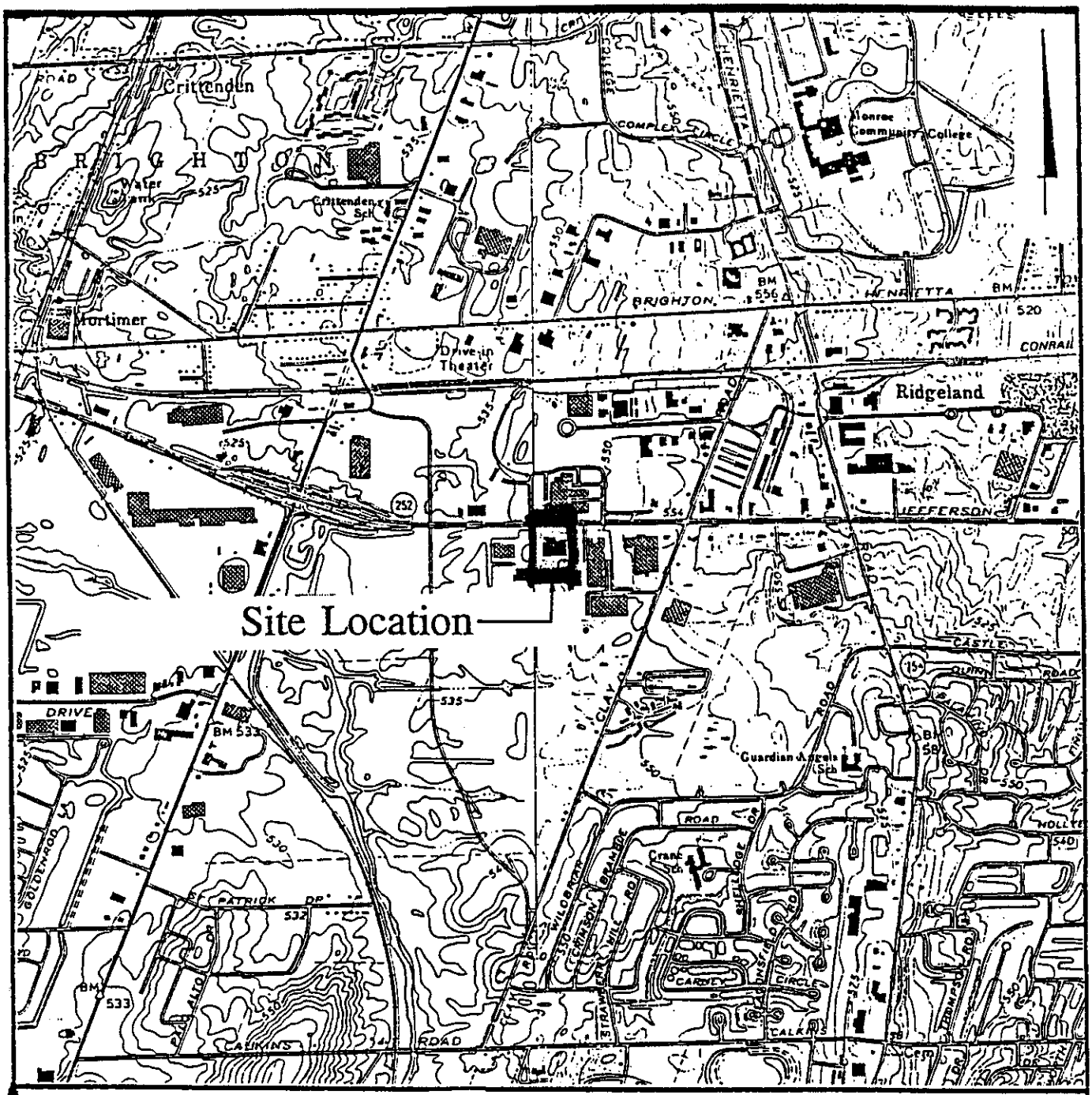
- Because the remedy results in consequential hazardous waste remaining untreated at the site, a long-term monitoring program will be instituted. This program will allow the effectiveness of the selected remedy to be monitored. This long-term monitoring program will be a component of the operation and maintenance associated with this site.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

Item	Date Issued
Citizens' Participation Plan	7/91
Fact Sheet	2/23/94
Public Comment Period	2/24 - 3/24/1994
Public Meeting	3/3/94

There were no comments received during the 30-day public comment period. Consequently, public comment did not influence the selected remedy.

Figure 1
Site Location Map



SOURCE: USGS 7 1/2 MINUTE TOPOGRAPHIC QUADRANGLES
PITTSFORD, NEW YORK, 1978 AND WEST
HENRIETTA, NEW YORK, 1978.

Figure 2
Site Map

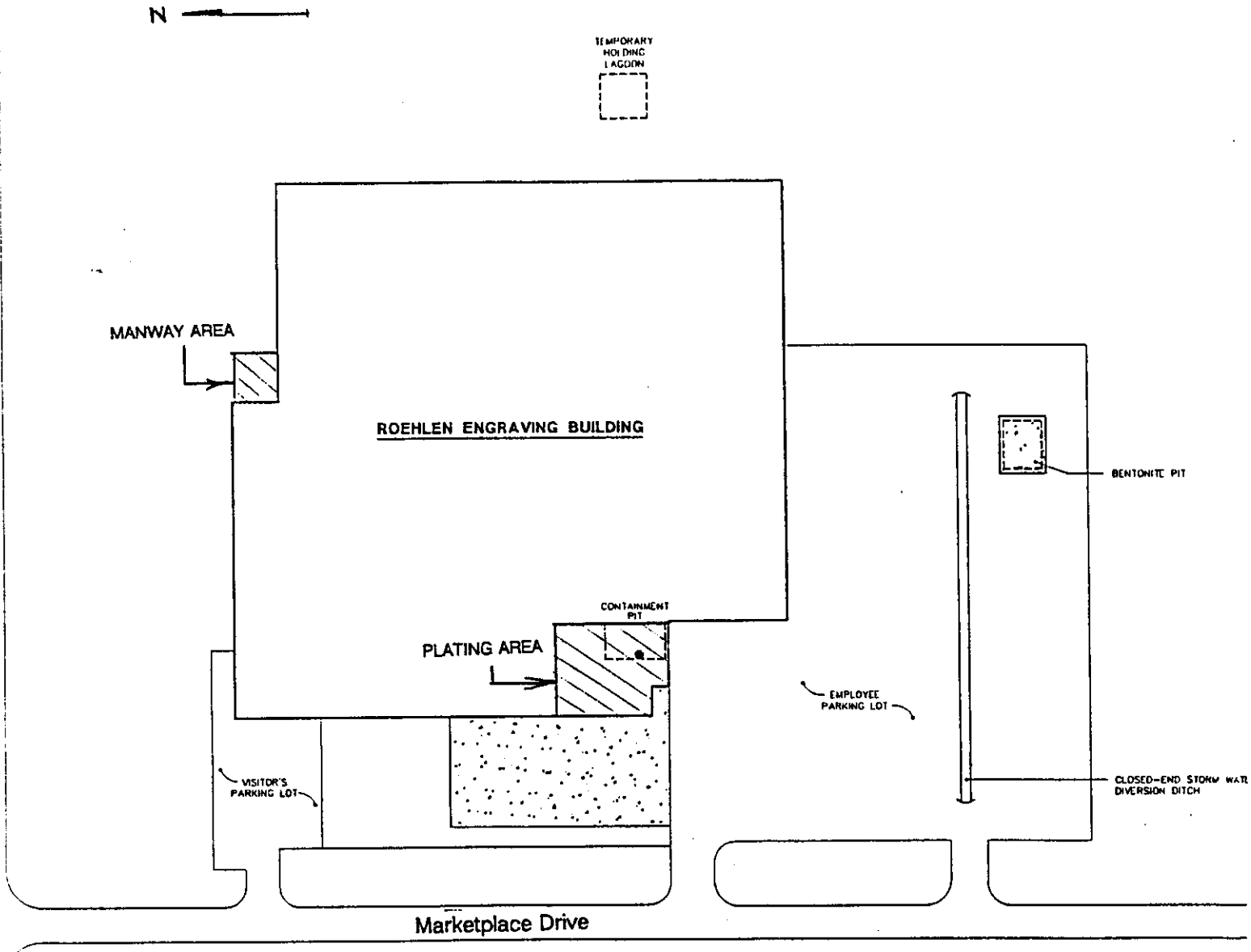


Figure 3
Total Chromium Concentrations in Groundwater

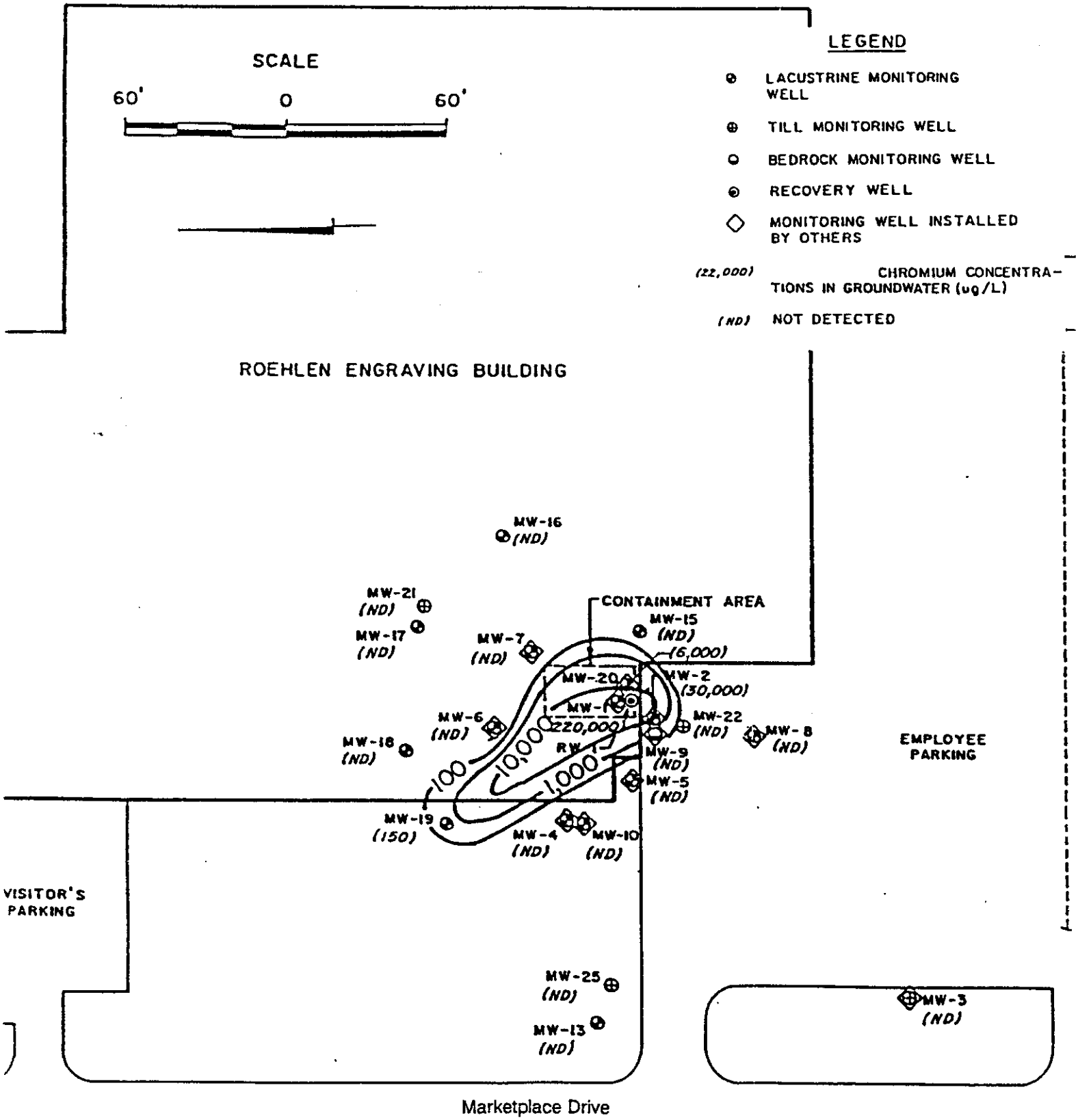
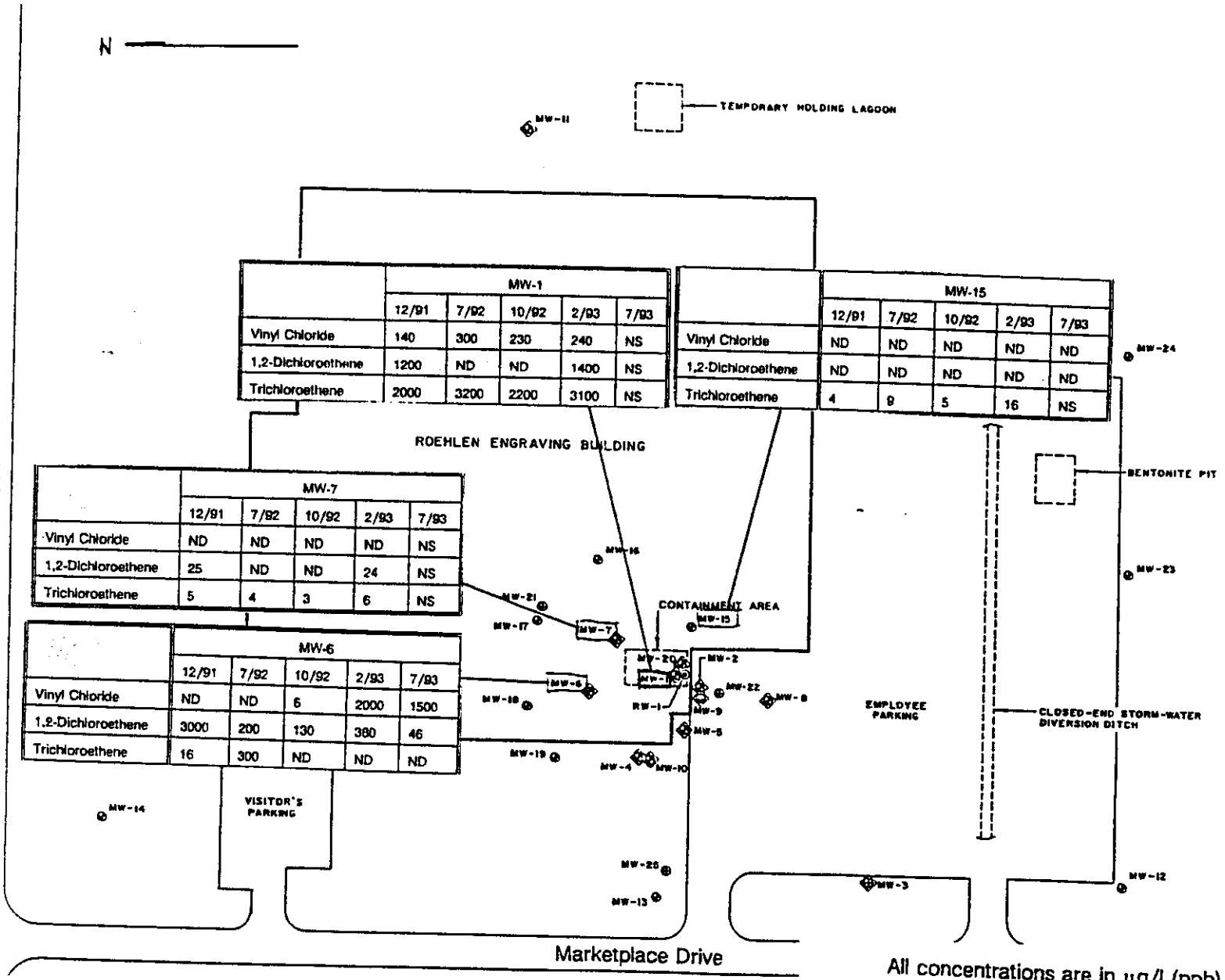


Figure 4
Volatile Organic Compounds In Groundwater



	MW-1				
	12/91	7/92	10/92	2/93	7/93
Vinyl Chloride	140	300	230	240	NS
1,2-Dichloroethene	1200	ND	ND	1400	NS
Trichloroethene	2000	3200	2200	3100	NS

	MW-15				
	12/91	7/92	10/92	2/93	7/93
Vinyl Chloride	ND	ND	ND	ND	ND
1,2-Dichloroethene	ND	ND	ND	ND	ND
Trichloroethene	4	9	5	16	NS

	MW-7				
	12/91	7/92	10/92	2/93	7/93
Vinyl Chloride	ND	ND	ND	ND	NS
1,2-Dichloroethene	25	ND	ND	24	NS
Trichloroethene	5	4	3	6	NS

	MW-6				
	12/91	7/92	10/92	2/93	7/93
Vinyl Chloride	ND	ND	6	2000	1500
1,2-Dichloroethene	3000	200	130	380	46
Trichloroethene	16	300	ND	ND	ND

All concentrations are in µg/l (ppb)
NS = Not Sampled
ND = Not Detected

Figure 5
Total Chromium Concentrations in Soils

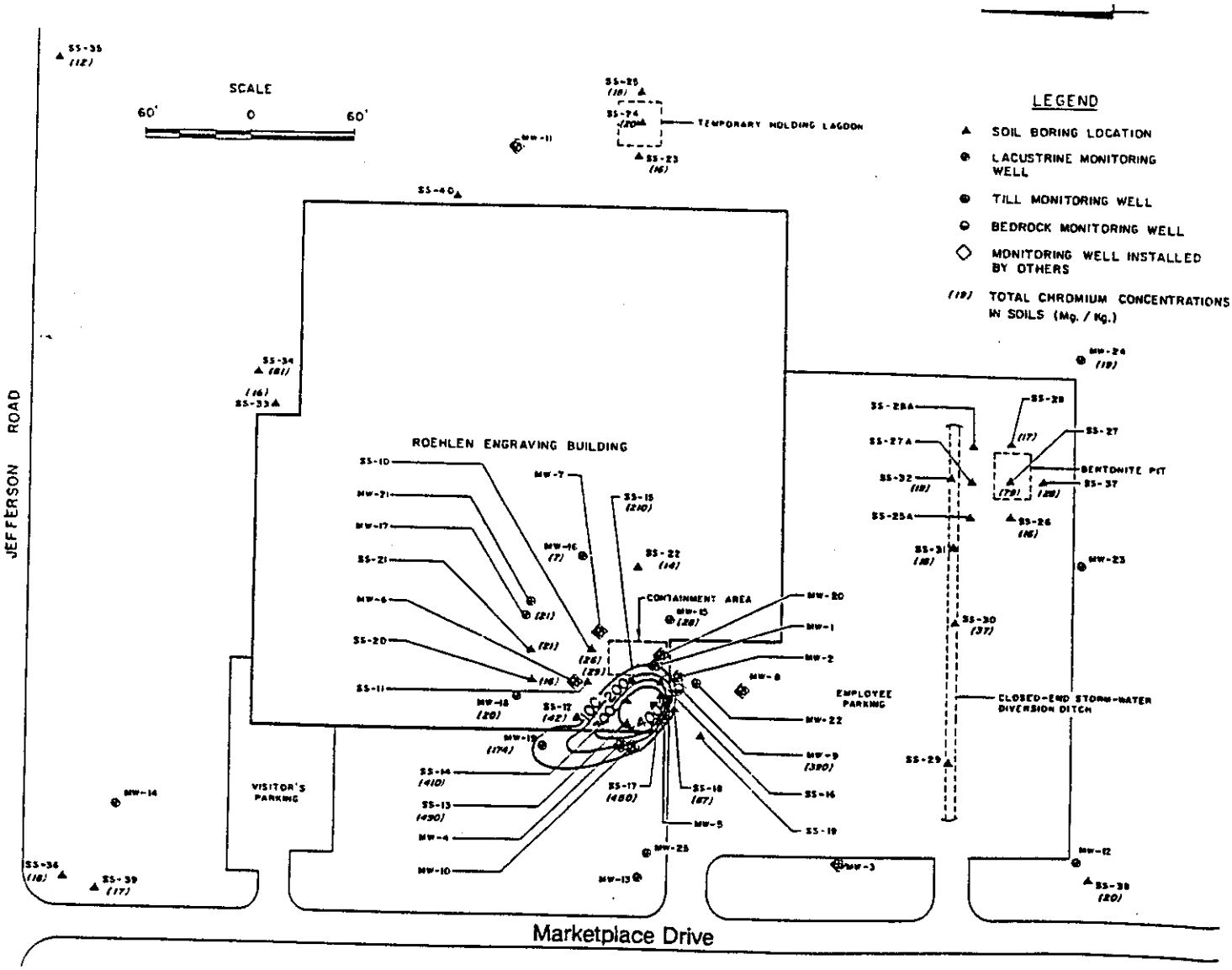


Table 1

Total Chromium Concentrations in Selected Groundwater Monitoring Wells

Well Number	Sampling Dates				NYS Standard
	12/91	7/92	10/92	2/93	
MW-1	112000	90000	61000	180000	50
MW-2	7500	23000	36000	26000	50
MW-5	672	ND	250	780	50
MW-6	20100	5600	680	620	50
MW-8	123	190	ND	ND	50
MW-19	195	ND	220	110	50
MW-20	56100	5700	6000	6300	50

Concentrations are in µg/l (ppb)
Data compiled from Remedial Investigation Report by Blasland, Bouck & Lee, Inc., February 1994

Table 2

Chlorinated Solvent Concentrations in Groundwater

	NYS Standard	MW-1					MW-6				
		12/91	7/92	10/92	2/93	7/93	12/91	7/92	10/92	2/93	7/93
Vinyl Chloride	2	140	300	230	240	NS	ND	ND	6	2000	1500
1,2-Dichloroethene	5	1200	ND	ND	1400	NS	3000	200	130	380	46
Trichloroethene	5	2000	3200	2200	3100	NS	16	300	ND	ND	ND
	NYS Standard	MW-7					MW-15				
		12/91	7/92	10/92	2/93	7/93	12/91	7/92	10/92	2/93	7/93
Vinyl Chloride	2	ND	ND	ND	ND	NS	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	25	ND	ND	24	NS	ND	ND	ND	ND	ND
Trichloroethene	5	5	4	3	6	NS	4	9	5	16	NS

All concentrations are in µg/l (ppb)
NS= Not Sampled
ND= Not Detected
Data compiled from Remedial Investigation Report by Blasland, Bouck & Lee, Inc., February 1994

Table 3

Groundwater Remedial Action Objectives (RAOs)

Compound or Analyte	Site Maximum Groundwater Concentration	New York State Groundwater Standard
Cadmium	182	10
Chromium	180,000	50
Hexavalent Chromium	220,000	50
Lead	1,820	25
Nickel	289	No Standard
Silver	280	50
Zinc	1,500	300
Trichloroethylene	3,200	5
1,2-Dichloroethylene	1,400	5
Vinyl Chloride	2,000	2

All concentrations are listed as µg/l (ppb)

Table 4

Soil Remedial Action Objectives (RAOs)

Compound or Analyte	Site Maximum Soil Concentration	Soil Cleanup Objective
Cadmium	2.8	SB (1.8)
Chromium	490	35
Hexavalent Chromium	< 2	10
Lead	110	SB (10)
Nickel	54	SB (22)
Silver	18	200
Zinc	250	SB (57)
Trichloroethylene	0.22	0.7
1,2-Dichloroethylene	0.046	0.3
Vinyl Chloride	ND	0.2

All concentrations are listed as mg/kg (ppm)
SB - Site Background
ND - Not Detected

Table 5

Summary of Remedial Costs ($)

	Remedial Alternatives							
	1	2	3	4	5	6	7	8
Capital Cost	0	77,000	31,000	47,000	318,000	79,000	140,000	244,000
Annual Operation & Maintenance Cost	0	19,000	62,000	74,000	83,000	83,000	249,000	50,000
Present Worth	0	256,000	615,000	745,000	892,000	653,000	1,292,000	507,000

Cost Data from Feasibility Study report prepared by Blasland, Bouck & Lee, Inc., February 1994

Appendix A

Administrative Record
Roehlen Engraving 8-28-077
Town of Henrietta, Monroe County

August 23, 1988	Roehlen Engraving submittal of "Soil and Groundwater Quality Assessment Report" prepared by Law Environmental.
March 14, 1989	Roehlen Engraving submittal of additional investigation report "Summary of Soil and Groundwater Quality Assessment" prepared by Law Environmental.
June 6, 1989	Letter from Robert Marino (NYSDEC) to Standex International Corporation. Roehlen Engraving was notified of addition to the Registry of Inactive Hazardous Waste Sites in New York State as a class 2.
July 6, 1989	Letter from Joel Nitzkin (MCHD) to Mike Khalil (NYSDEC). Regarding the review of the "Groundwater Quality Assessment Report."
August 3, 1989	Letter from Glen Bailey (NYSDEC) to John Donovan of Roehlen Engraving. Transmittal of review comments for previous investigation reports.
February 13, 1990	"Historical Site-Usage Report" prepared by Law Environmental
April 9, 1990	Letter from Richard Elliott (MCHD) to Mike Khalil (NYSDEC). Review comments from Historical site usage report and Phase III Investigation (RI/FS) work plan.
May 16, 1990	Letter from Todd Caffoe (NYSDEC) to Tom Walsh of Nixon, Hargrave, Devans, and Doyle (NHDD). Transmittal of review comments for the Phase III Investigation (RI/FS) work plan.
June 21, 1990	Letter from Law Environmental to Tom Walsh (NHDD). Response to NYSDEC comments for RI/FS work plan.
June 22, 1990	Letter from Tom Walsh (NHDD) to Todd Caffoe (NYSDEC). Transmittal of Law Environmental response to NYSDEC comments.
July 20, 1990	Letter from Todd Caffoe (NYSDEC) to Tom Walsh (NHDD). Approval to install and develop two monitoring wells inside the containment pit during a facility shutdown.
August 7, 1990	Letter from Todd Caffoe (NYSDEC) to Tom Walsh (NHDD). Review comments for revised RI/FS work plan.
August 29, 1990	Letter from Law Environmental to Tom Walsh (NHDD). Response to NYSDEC comments for revised RI/FS work plan.

August 30, 1990	Letter from Tom Walsh (NHDD) to Todd Caffoe (NYSDEC). Transmittal of Law Environmental Response to NYSDEC comments.
September 18, 1990	Letter from Todd Caffoe (NYSDEC) to Tom Walsh (NHDD). NYSDEC comments on the RI/FS work plan.
October 4, 1990	RI/FS work plan. Dated 10/4/91 and approved on 3/1/91.
October 9, 1990	Letter from Tom Walsh (NHDD) to Todd Caffoe (NYSDEC). Transmittal of RI/FS work plan.
March 1, 1991	Letter from Todd Caffoe (NYSDEC) to Tom Walsh (NHDD). NYSDEC approval of RI/FS work plan.
April 25, 1991	Signed Order on Consent in the matter of implementation of a Remedial Investigation/Feasibility Study... Index # B8-0247-88-12.
May 3, 1991	Letter from Glen Bailey (NYSDEC) to Tom Walsh (NHDD). Transmittal of endorsed Order on Consent.
May 29, 1991	Letter from William Popham of Blasland & Bouck (B&B), to Todd Caffoe (NYSDEC). Modification to RI/FS work plan due to a change in the consultant representing Roehlen Engraving.
May 31, 1991	Letter from William Popham (B&B) to Todd Caffoe (NYSDEC). Revisions to Health and Safety Plan.
July 1991	Citizen Participation Plan prepared by NYSDEC.
August 15, 1991	Letter from William Popham (B&B) to George Momberger (NYSDEC). Analytical laboratory justification.
November 1, 1991	Letter from William Popham (B&B) to George Momberger (NYSDEC). Analytical laboratory justification.
November 8, 1991	Letter from George Momberger (NYSDEC) to William Popham (B&B). Analytical Laboratory justification.
June 1, 1992	Letter from William Popham (B&B) to Todd Caffoe (NYSDEC). Transmittal of first round groundwater analytical data with recommendations for site-specific parameters.
June 22, 1992	Letter from Todd Caffoe (NYSDEC) to Larry Blue of Roehlen Industries (R-I). Approval of site specific parameters list.
June 29, 1992	Letter from William Popham (B&B) to Todd Caffoe (NYSDEC). Second round groundwater sampling.
October 23, 1992	Letter from William Popham (B&B) to Todd Caffoe (NYSDEC). Second round groundwater sampling.
December 11, 1992	Letter from William Popham (B&B) to Betty Seeley (NYSDEC). First round preliminary data validation.

January 13, 1993	Letter from Todd Caffoe (NYSDEC) to Larry Blue (R-I). First round analytical data validation comments.
February 1, 1993	Letter from Mark Weider (B&B) to Todd Caffoe (NYSDEC). First round analytical data validation review.
February 5, 1993	Letter from Mark Weider (B&B) to Todd Caffoe (NYSDEC). Notification of the third groundwater sampling event.
April 14, 1993	Letter from Larry Blue (R-I) to Todd Caffoe (NYSDEC). Postpone start-up of recovery well until after issuance of the ROD.
May 3, 1993	Letter from William Popham (B&B) to Todd Caffoe (NYSDEC). Transmittal of draft Remedial Investigation Report.
July 31, 1993	Letter from Mark Weider (B&B) to Todd Caffoe (NYSDEC). Regarding the scope of the Health Based Risk Assessment.
July 1, 1993	Letter from Mark Weider (B&B) to Todd Caffoe (NYSDEC). Additional groundwater sampling issues.
July 2, 1993	Letter from Todd Caffoe (NYSDEC) to Larry Blue (R-I). NYSDEC review comments on the Remedial Investigation Report.
August 31, 1993	Letter from Mark Weider (B&B) to Todd Caffoe (NYSDEC). Remedial Investigation Addendum.
September 29, 1993	Letter from Todd Caffoe (NYSDEC) to Larry Blue (R-I). NYSDEC comments on the RI addendum.
October 6, 1993	Letter from Michele Anatra-Cordone (B&B) to Lani Rafferty (NYSDOH). Risk Assessment exposure assumptions.
October 14, 1993	Letter from Mark Weider (B&B) to Todd Caffoe (NYSDEC). Response to NYSDEC comments on the RI addendum.
October 29, 1993	Letter from Mark Weider (B&B) to Todd Caffoe (NYSDEC). Transmittal of revised RI Addendum.
November 12, 1993	"Preliminary Screening of Remedial Alternatives Report" - November 1993
November 12, 1993	"Baseline Risk Assessment" - November 1993
December 3, 1993	Letter from Todd Caffoe (NYSDEC) to Larry Blue (R-I). NYSDEC comments on "Preliminary Screening of Remedial Alternatives."
December 6, 1993	Letter from William Popham (B&B) to Todd Caffoe (NYSDEC). Transmittal of draft "Feasibility Study Report."
December 20, 1993	Letter from Todd Caffoe (NYSDEC) to Larry Blue (R-I). Approval of the Remedial Investigation report addenda and RI report.
January 31, 1994	Letter from Todd Caffoe (NYSDEC) to Larry Blue (R-I). NYSDEC review comments on the "Feasibility Study Report."

February 7, 1994	Letter from William Popham (B&B) to Todd Caffoe (NYSDEC). Transmittal of final "Remedial Investigation Report."
February 7, 1994	"Remedial Investigation Report" - Volume 1 April 1993, revised February 1994. Volumes 2 and 3 April 1993. QA/QC - Appendix J (7 volumes) and Appendix K (1 volume) April 1993.
February 7, 1994	"Feasibility Study Report" - December 1993, revised February 1994. Prepared by Blasland & Bouck, certified by Edward Lynch, P.E.
February 16, 1994	Letter from Mark Welder (B&B) to Todd Caffoe (NYSDEC). Transmittal of corrected tables for the "Feasibility Study Report."
February 18, 1994	Proposed Remedial Action Plan prepared by NYSDEC and released for public comment on 2/24/94.
February 22, 1994	Fact Sheet and Public Meeting Announcement.
February 28, 1994	Letter from Todd Caffoe (NYSDEC) to Larry Blue (R-I). NYSDEC approval of "Feasibility Study Report."