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Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R02-91/142
March 1991

EPA

Superfund Record of Decision:

Genzale Plating, NY

50272-101

REPORT DOCUMENTATION PAGE

1. REPORT NO. EPA/ROD/R02-91/142

2.

3. Recipient's Accession No.

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Genzale Plating, NY
First Remedial Action

5. Report Date 03/29/91

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7. Author(s)

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U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered
800/000

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Genzale Plating site is an electroplating facility, which occupies a 24,000-square-foot area in Franklin Square, Nassau County, New York. Land use in the area is predominantly residential, with a wetlands area located approximately 3 miles southeast of the site. The site overlies a Class II aquifer, which is tapped by three water supply wells within 1.5 miles of the site. Since 1915, the Genzale Plating Company, Inc., operated an electroplating facility onsite. Records indicate that copper, silver, zinc, cadmium, nickel, and chromium compounds, as well as acids and cleaners, were used during plating processes. Wastewaters generated from the electroplating operations were discharged to four subsurface leaching pits. Following a 1981 county inspection, the owner was required to discontinue onsite contaminant discharge to the leaching pits. Testing of the wastewater samples from the pits indicated heavy metal concentrations in excess of State discharge standards. In 1982, 36 cubic yards of contaminated material were excavated; but the entire excavation was never completed. In April 1983, a State investigation determined that onsite contaminants presented a potential public health threat because the site is in close proximity to public water supply wells. The primary contaminants of concern affecting

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Genzale Plating, NY
First Remedial Action
Contaminated Media: soil, gw
Key Contaminants: VOCs (PCE, TCE), other organics (PAHs), metals (arsenic, chromium, lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

19. Security Class (This Report) None

20. Security Class (This Page) None

21. No. of Pages 76

22. Price

(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

Abstract (Continued)

the soil and ground water are VOCs including PCE and TCE; other organics including PAHs; and metals including arsenic, chromium, and lead.

The selected interim remedial action for this site includes treating soil using in-situ vacuum extraction and vapor phase carbon adsorption to control emissions, followed by excavating 1,600 cubic yards of the treated soil and 480 cubic yards of topsoil and material from the leaching pits, followed by offsite treatment and disposal; backfilling the excavated areas with clean soil; pumping and treatment of ground water using precipitation to remove metals, followed by air stripping, with reinjection onsite and offsite disposal of treatment residuals. The estimated present worth cost for this remedial action is $6,358,700, which includes an annual O&M cost of $223,800.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific soil clean-up goals include TCE 1 mg/kg. Ground water treatment will be designed to reduce the metals concentrations in the treated ground water below the Federal and State ground water standards.

ROD FACT SHEET

SITE

Name: Genzale Plating Company
Location/State: Franklin Square, Nassau County, New York
EPA Region: II
HRS Score (date): 33.79 (May 1986)
NPL Rank (date): # 789 (July 1987)

ROD

Date Signed: March 29, 1991

Selected Remedy

Soils - In-Situ Vacuum Extraction/Surface Excavation/ Leaching Pit Excavation/Off-Site Treatment and Disposal/Fill With Clean Soil

Capital Cost: $ 1,891,200
O & M/Year: $ 32,700
Present Worth: $ 2,449,500

Groundwater - Pumping/Metals Precipitation/Air Stripping/ Reinjection

Capital Cost: $ 971,500
O & M/Year: $ 191,100
Present Worth: $ 3,909,200

LEAD

Remedial, EPA
Primary Contact (phone): Janet Cappelli (212-264-8679)
Secondary Contact (phone): Douglas Garbarini (212-264-0109)

WASTE

Type: inorganic (e.g. cadmium, chromium, lead, nickel) and organic (1,1,1-trichloroethane; trichloroethylene; 1,2-dichloroethane)
Medium: ground water and soil
Origin: Pollution originated during the operation of the Genzale Plating Company. The processes used resulted in the generation, storage and disposal of waste water into four unlined leaching pits.

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Genzale Plating Company, Franklin Square, Nassau County, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Genzale Plating Company site, located in Nassau County, New York, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. § 9601, et seq., and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300. The attached index (Appendix V) identifies the items that comprise the administrative record upon which the selection of the remedial action is based.

The State of New York concurs with the selected remedy.

ASSESSMENT OF THE SITE

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

DESCRIPTION OF SELECTED REMEDY

This operable unit represents the first of two planned for the site. It addresses the treatment of both groundwater in the immediate vicinity of the property and those soils contaminated primarily with heavy metals and volatile organics. The selected groundwater remedy is an interim action and does not constitute the final action for groundwater. The second operable unit will involve the study and possible remediation of a plume of groundwater contamination downgradient of the property.

The major components of the selected remedy include:

Groundwater

- Containment of the most highly contaminated portion of contaminant plume;

- Treatment, via metal precipitation and air stripping, of contaminated groundwater in the Upper Glacial Aquifer to drinking water standards prior to reinjection; and,

- Disposal of treatment residuals at a RCRA Subtitle C facility.

- Collection of data on aquifer and contaminant response to remediation measures.

Soils

- In-situ vacuum extraction for volatile organics followed by surface excavation over the entire property, and deeper excavation of leaching pit "hot spots";

- Off-site treatment and disposal of excavated material at a RCRA subtitle C facility; and,

- Backfill with clean soil.

STATUTORY DETERMINATIONS

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

The selected groundwater remedy is an interim action and it does not constitute the final remedy for the groundwater portion of the site. Therefore, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be addressed at the time of the final response action. Subsequent actions are planned to address fully the potential threats posed by a plume of groundwater contamination.

The need for conducting a five-year review will be evaluated upon completion of the second operable unit.

Constantine Sidamon-Eristoff
Regional Administrator

Date 3/29/91

DECISION SUMMARY

GENZALE PLATING COMPANY

FRANKLIN SQUARE, NEW YORK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

NEW YORK

TABLE OF CONTENTS

SITE NAME, LOCATION AND DESCRIPTION

The Genzale Plating Company site (the "Site") includes the property located at 288 New Hyde Park Road in the Town of Franklin Square, Nassau County, New York. The Genzale Plating Company facility ("Facility") lies immediately adjacent to New Hyde Park Road, Kalb Avenue, and Cathedral Road on the west, east, and north, respectively (see Figure 1). The properties immediately adjacent to and surrounding the Genzale Plating facility are primarily residential.

The Facility occupies an area of approximately 24,000 square feet. The western portion of the Facility property is occupied by a two story building which houses the company office, plating facility, and chemical storage area. The eastern portion of the Facility is undeveloped and serves as an outdoor storage yard and parking lot. Subsurface structures located in the yard include sanitary and industrial sewer lines, and four abandoned wastewater leaching pits.

Census data indicate that the population density in the vicinity of the Facility is estimated to be on the order of 3,000 to 6,000 persons per square mile. The properties immediately adjacent to and surrounding the Facility are predominantly residential. Although small businesses do exist, they are generally restricted to New Hyde Park Road both north and south of the Facility. Agricultural land use is not practiced in the area surrounding the Site.

Regionally, the naturally-occurring surface soils are a sandy loam which generally promote rapid infiltration of precipitation to the groundwater. Site specific soils and those of the surrounding area are, however, classified as urban soils. Greater surface runoff of precipitation is characteristic of developed areas (i.e., buildings and pavement). The ground surface at the Facility is entirely unpaved and therefore exposed.

Directly underlying the Site is the Upper Glacial Aquifer, which is designated with the federal classification II for a drinking water source. Although not generally used as a potable water supply, it is tapped by three Jamaica Water Supply Company wells within 1-1.5 miles of the Site. Most water supply wells in the vicinity of the Site are screened within the deeper Magothy Aquifer. The Magothy aquifer, underlying the glacial sediments, is the thickest hydrogeological unit on Long Island. In the vicinity of the Site, it is estimated to be approximately 350 - 400 feet thick. Although this aquifer is confined in southern Long Island, it is believed to be unconfined or under semi-confined conditions in the vicinity of the Site. In the Site area, groundwater flow is in a south-southwesterly direction.

The nearest downgradient surface water bodies to the Site are located approximately 3.2 miles southwest and 3.0 miles

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The nearest downgradient surface water bodies to the Site are located approximately 3.2 miles southwest and 3.0 miles southeast, at Valley Stream State Park and Hempstead Lake State Park, respectively. The slope of the ground surface between the Site and these surface water bodies is less than 1 percent. The nearest wetland area is located approximately 3.0 miles to the southeast of the Site in Hempstead Lake State Park. There is no designated New York State significant habitat, agricultural land, nor historic or landmark site directly or potentially affected by conditions at the Site. There are no endangered species or critical habitats within close proximity of the Site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Genzale Plating Company, Inc. (the "Company") is an electroplating facility that has been in operation at this Site since 1915. Over time, the production activities and chemicals used in the electroplating process have changed. The earliest record of operations at the Genzale facility dates back to 1952. At that time, processing was reported to have involved anodizing and cadmium, zinc, and brass plating. In 1954 electroplating operations are on record as utilizing the following chemical compounds: copper, cyanide, silver cyanide, zinc cyanide, cadmium oxide, chromic acid, nickel sulfate, sulfuric acid, nitric acid, and alkali cleaners. The relative quantities of chemicals used at the Site during this period of time are unknown.

At present, the Company electroplates such products as automobile antennas and component parts; tops and bottoms of ball point pens; and housewares such as can and bottle openers. The electroplating process performed at the Site since 1959 involved a number of different steps which included the use of a variety of chemicals. The electroplating process is carried out by dipping and advancing the materials to be plated through a series of processing tanks or vats. Rinsing the metal parts between each processing tank generates wastewater which is discharged to the municipal sewer system for disposal. Previously, wastewater was discharged to the subsurface leaching pits located in the rear yard area of the Site. It should be noted, that wastewater was detected in three of the four leaching pits as recently as 1981. Distillation of spent solvent (1,1,1-trichloroethane) is presently in operation on the Site to condense out clean product for re-use. The sludge remaining from the distillation process is stored on-site for eventual removal.

In April 1981, the Nassau County Department of Health ("NCDH") conducted an inspection of the Genzale facility. During this inspection, NCDH noted that industrial wastewater from the plating facility was being discharged to at least three of four on-site leaching pits. NCDH representatives instructed Company personnel to discontinue discharge to the leaching pits at that time. In addition, wastewater samples were obtained from the leaching pits by NCDH and submitted for laboratory analysis of inorganic compounds only. The results indicated that the wastewater samples exhibited heavy metal concentrations in excess of New York State Department of Environmental Conservation ("NYSDEC") discharge standards.

In March 1982, the Company's owners contracted Gamma TEC Consulting Engineers to excavate potentially contaminated materials from the leaching pits. An estimated total of 36 cubic yards of material was removed from three of the leaching pits at the Facility. Due to a lack of financial resources available to the Company, leaching pit excavation was not completed.

Woodward-Clyde Consultants, Inc. ("WCCI") performed a site survey in April 1983, under contract to the NYSDEC. WCCI concluded that contaminant transport from the Site presented a "relatively low", yet potential public health threat due to the Site's proximity to a number of public water supply wells. The nearest supply well is approximately 1300 feet east of the Site. In June 1986, the Site was added to the EPA National Priorities List of Superfund sites.

A special notice letter was issued to the Company on December 31, 1987 by the EPA. Based upon the Company's response it was determined that it was financially unable to conduct the investigative activities at the Site. Accordingly, EPA proceeded with the Remedial Investigation and Feasibility Study ("RI/FS"). A work plan for the RI/FS was completed in October 1988, however field work could not be initiated due to problems obtaining access. In August 1989, EPA issued an Access Order to the Genzale Plating Company so that field work could commence. As a result of the Company's failure to comply, EPA sought and was granted a court ruling in October 1989 which enforced the terms of the Order. Field work for the RI/FS began in November 1989 and was completed in February 1990.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

A Community Relations Plan for the Site was finalized in November 1988. This document lists contacts and interested parties throughout government and the local community. It also established communication pathways to ensure timely dissemination of pertinent information. Subsequently, a factsheet outlining the RI sampling program was distributed in November 1989 and a public availability session was held on November 21, 1989 to answer questions.

The RI/FS reports and the Proposed Plan for the Site were released to the public on February 22, 1991. These documents were made available to the public in both the administrative record file and the information repositories maintained at the EPA Record Center room in Region 2 and at the Franklin Square Library. A press release concerning the availability of the RI/FS reports, the Proposed Plan, and the initiation of the public comment period was issued on February 22, 1991. A public notice was published in a local newspaper which provided a 30-day public comment period, ending on March 23, 1991. In addition, a public meeting was held on March 13, 1991 at which representatives from EPA and NYSDEC answered questions about the problems at the Site and remedial alternatives under consideration. All comments which were received by EPA prior to the end of the public comment period, including those expressed verbally at the public meeting, are addressed in the Responsiveness Summary which is attached, as Appendix E, to this Record of Decision.

This decision document presents the selected remedial action for the Genzale Plating Company site, in Franklin Square, New York, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), as amended, and to the extent practicable, the National Contingency Plan. The decision for this Site is based on the administrative record.

SCOPE AND ROLE OF RESPONSE ACTION

The areas of concern addressed by this response action include soils and groundwater in the vicinity of the Facility. These areas of the Site pose the principal threat to human health and the environment because of risk from possible ingestion, inhalation, or dermal contact with the soils and/or groundwater. Although the results of the RI/FS indicate the need for an interim groundwater remedial action, EPA was unable to delineate the extent of the groundwater plume beyond the Facility property. An additional investigation of the nature and extent of the plume will be initiated under a second operable unit. The purpose of this interim groundwater remedy is to work toward the overall goal of aquifer restoration, but it does not constitute the final action for groundwater.

The overall objective of this response action is to reduce the concentrations of contaminants in the on-site soils to levels which are protective of human health and the environment, to reduce the concentrations of contaminated groundwater underlying the Facility in order to reduce the risk associated with the contaminants, and to prevent further deterioration of the area groundwater.

SUMMARY OF SITE CHARACTERISTICS

Previous investigations and the RI (Ebasco, 1991) have shown that there were discharges of untreated process wastewater to leaching pits located in the rear yard area of the Site. Media sampled during the remedial investigation included surface soils, subsurface soils, and groundwater.

Groundwater

Two rounds of unfiltered groundwater samples were collected from eight monitoring wells, six installed at the Facility and two installed downgradient of the Facility, four water supply wells, one County monitoring well, and one private irrigation well. The locations of the monitoring wells at the Facility and the downgradient wells are shown on Figures 2 and 3, respectively. The wells at the Facility were installed and screened in both shallow (30 - 40 ft below surface) and deep (60 - 70 feet below surface) portions of the Upper Glacial Aquifer. Groundwater level measurements obtained from the newly installed wells indicated that groundwater generally occurred 32 - 36 feet below the surface. Exceedingly high contaminant values were consistently detected in shallow wells located at the Facility. The four volatile organic compounds which were most abundant from both a concentration and frequency of occurrence basis include: trichloroethene (TCE), 1,1,1-trichloroethane (TCA), 1,1-dichloroethene (DCE), and tetrachloroethene (PCE). TCA and TCE were present at the greatest concentrations in the groundwater underlying the Facility (1,100 and 500 parts per billion, respectively). Inorganics such as chromium, nickel, copper, cadmium, manganese, and iron were also detected. Maximum concentration levels of primary contaminants of concern in the groundwater can be found in Table 1.

Surface/Subsurface Soils

The soil sampling program involved the determination of lateral and vertical extents of contamination by obtaining samples from seven surface soil locations, six soil borings, two leaching pit borings, and three monitoring well borings. All soil sampling locations are depicted on Figure 4. Many of the contaminants found in the soils were the same as those found in the groundwater. Table 2 lists the overall maximum, average, and minimum concentrations of contaminants detected in the on-site soils.

The surface soils were sampled between a depth of 0 - 2 feet below grade. Inorganic compound concentrations exceeding regional background levels were detected at almost all surface soil locations sampled. Typical background concentration levels of inorganic compounds are shown on Table 3. Inorganic compounds consistently detected at elevated levels include: chromium, copper, lead, nickel, and zinc. The highest concentration of most, if not all, inorganic compounds at the surface were detected at boring location SB-06. This boring was advanced directly through a former leaching pit. Maximum surface concentrations at SB-06 include chromium at 14,800 mg/kg (background (bg) 10 - 80 mg/kg), nickel at 46,400 mg/kg (bg 4 -30 mg/kg), lead at 1,440 mg/kg (bg 3 - 30 mg/kg), and copper at 11,200 mg/kg (bg 2 - 100 mg/kg). The highest values of volatile organics in surface soils were also detected in samples located at SB-06. The maximum concentration of TCE detected at 0 - 2 feet is reported at 120 ug/kg.

Inorganic compounds consistently detected at elevated values in subsurface soils include: chromium, nickel, lead, and to a lesser extent, copper and cadmium. The highest concentrations of these compounds are generally detected in subsurface soils of sampling locations SB-06, SB-04, SB-05, and SB-02. In general, inorganic compound concentrations decrease with depth from maximum values exhibited at (0 - 2 feet) or near (approximately 5 feet below grade) the surface. The maximum chromium value detected at the Site was 27,300 mg/kg in SB-06 at a depth of 2 - 4 feet. High levels of chromium, nickel, and lead were detected in locations SB-05 and SB-02 occurring at depths of 10 and 30 feet, respectively. The distribution of organic contaminants and the concentrations at which they occur in subsurface soil vary greatly upon location. Volatile organics detected most frequently include TCE and TCA (maximum concentrations of 53 and 7 mg/kg, respectively).

The volume of soil contaminated by organic compounds is estimated to be 3,150 cubic yards. The areas of organic contamination, approximately 2500 square feet, are depicted on Figure 5. Most of the inorganic contamination was detected in the top 4 - 5 feet of the Site, resulting in approximately 1,600 cubic yards of contaminated soil, with the exception of inorganic contamination as deep as 40 feet below grade related to the former leaching pits. The estimated amount of this deeper inorganic contamination is 480 cubic yards. This amount is based upon the leaching pits being between 12 - 18 feet in depth and 12 feet in width and assumes that soils within roughly 2 feet of these parameters would also require excavation.

SUMMARY OF SITE RISKS

A baseline risk assessment was developed as part of the remedial investigation for the Site. The risk assessment evaluates the potential impacts on human health and the environment if the contamination at the Site is not remediated. The assessment also anticipates potential future uses for the Site. This information is used by EPA to make a determination as to whether remediation of the Site is required.

Two scenarios were developed based on current (industrial) and possible future (residential) land use at the Facility. Under both scenarios, several pathways (direct contact, inhalation and ingestion) were evaluated for exposure to surface and subsurface soils, air, and groundwater used for drinking and domestic purposes. The populations evaluated included nearby residents, current and future on-site workers, future on-site development workers, and future on-site adult and child residents. An exposure assessment was conducted to estimate the magnitude, frequency, and duration of actual and/or potential exposures to the chemicals of potential concern via all pathways by which humans are potentially exposed. Exposures were based on reasonable maximum concentrations, calculated as the 95th percentile upper confidence limit of the geometric mean. This reasonable maximum exposure is defined as the highest exposure that is reasonably expected to occur at the Site for individual and combined pathways.

Based on the evaluations performed during the risk assessment, the contaminants which are likely to pose the most significant risks to human health and the environment (i.e., chemicals of concern) were identified for the soil and groundwater. The chemicals concern in the soil are cadmium, chromium, nickel, barium, lead, copper, arsenic, trichloroethene, bis (2-ethylhexyl) phthalate, and chrysene. The chemicals of concern in the groundwater are trichloroethene, 1,1,1-trichloroethane, 1,1-dichloroethene, tetrachloroethene, cadmium, chromium, copper, lead, and nickel. The maximum concentrations of these contaminants are provided in Table 1. All levels of primary contaminants detected in the groundwater exceeded federal and/or state drinking water standards.

Under current EPA guidelines, the likelihood of carcinogenic (cancer causing) and noncarcinogenic (non-cancer) effects due to exposure to site chemicals are considered separately. EPA considers carcinogenic risk in the range of 10^{-4} to 10^{-6} to be acceptable. This risk range can be interpreted to mean that an individual may have a one-in-ten-thousand to a one-in-a-million increased chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the Site.

Potential carcinogenic risks were evaluated using the cancer potency factors developed by the EPA for the chemicals of concern. Cancer potency factors ("CPF"s) have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at the intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes the underestimation of the risk highly unlikely. CPFs for chemicals of potential concern can be found on Table 4.

EPA's baseline risk assessment indicates that the most significant public health risk results from the ingestion of groundwater, inhalation of groundwater volatiles (i.e., while showering), and direct contact and ingestion of soils. Table 5 summarizes the baseline risk assessment results. Under the future-use scenario, ingestion of groundwater in the vicinity of the Facility by off-Facility adult residents would present an excess cancer risk of 2.56×10^{-3}; ingestion of groundwater by on-Facility adult residents would present an excess cancer risk of 2.55×10^{-3} and for on-Facility child residents an excess cancer risk of 1.7×10^{-3}. This indicates that future off-Facility and on-Facility adults have approximately a three-in-one-thousand additional chance of developing cancer, and on-Facility children have a two-in-one-thousand additional chance of developing cancer, as a result of drinking this groundwater. Under the future-use scenario for on-Facility development workers, inhalation of the Site soils during construction activity would present an excess cancer risk of 9.96×10^{-4}. This indicates that an on-Facility worker involved in construction and excavation activities would have approximately a one-in-one-thousand additional chance of developing cancer.

The non-cancer risk associated with different pathways was assessed using a hazard index ("HI") approach, based on comparison of expected contaminant intakes and safe levels of intake (reference doses). Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects. The chronic and subchronic RfDs for chemicals of potential concern can be found on Table 4. RfDs, which are expressed in units of milligram per kilogram per day (mg/kg-day), are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated soil) are compared with the RfD to derive the hazard quotient for the contaminant in the particular media. The HI is obtained by adding the hazard quotients for all compounds across all media. An HI value greater than 1.0 is considered to pose an unacceptable non-cancer risk. Under the current-use worker scenario, inhalation and ingestion of Site soils contributes to an HI of 2.2. Under the future-use scenario, ingestion of groundwater for off-Facility adult residents presents an HI value of 86.2; ingestion of groundwater for on-Facility adult residents presents and HI value of 86.2 and for on-Facility child residents an HI of 114; ingestion and dermal contact with soils for on-Facility adult residents contributes to an HI value of 2.56 and for on-Facility child residents an HI of 15.4; ingestion and dermal contact with Site soils by future on-Facility workers presents and HI of 2.2 and for future Site development workers an HI of 23.9. For soil pathways, the chemicals of concern which contribute the most to the HI values are chromium and nickel. For groundwater pathways, the largest chemical contributors are antimony, chromium, and nickel.

The risk assessment contains the conclusion that inhalation of Site soils by current off-Facility residents does not present a non-cancer risk nor an excess cancer risk.

In summary, it is evident that the contaminants in soils at the Facility and underlying groundwater warrant remediation in order to prevent the continued degradation of groundwater quality in the area and to reduce their associated risks.

Uncertainties

The procedures used to assess potential human health risks in this evaluation are subject to wide uncertainties. In general, the main sources of uncertainty in this assessment include:

- environmental chemistry sampling and analysis;
- exposure models and assumptions; and
- toxicological models and parameters.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled. Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come into contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemical so concern at the point of exposure. Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making very conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

Actual or threatened releases of hazardous substances from this Site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to the environment through the groundwater pathway.

DESCRIPTION OF ALTERNATIVES

Following a screening of remedial technologies in accordance with the NCP, five remedial alternatives were developed for contaminated groundwater and six for contaminated soil. The alternatives were further screened based on technical considerations such as effectiveness, implementability, and cost. The present worth costs listed below for all soil and groundwater alternatives are based on a 30-year period and a 5% discount rate.

Remedial Alternatives for Contaminated Soils (SC)

- ▲ SC-1: No-Action
- ▲ SC-2: Surface Excavation/Off-Site Treatment and Disposal/Capping
- ▲ SC-3: In-Situ Vacuum Extraction/In-Situ Stabilization (Solidification)/Soil Cover
- ▲ SC-4: In-Situ Vacuum Extraction/Excavation/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil
- ▲ SC-5: In-Situ Vacuum Extraction/Surface Excavation/ Excavation of Leaching Pits/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil

Alternative SC-1: No-Action

Capital Cost: $ 65,600
Annual Operation & Maintenance (O & M) Cost: $34,400
Present Worth Cost: $650,000
Time to Implement: 6 months

CERCLA requires that the No-Action alternative be considered as a baseline for comparison with other soil alternatives. Under this alternative, the contaminated soil would be left in place without treatment. A long-term monitoring program would be implemented to track the migration of contaminants from the soil into the groundwater utilizing existing monitoring well clusters as well as a total of 10 newly installed cluster wells. This alternative also includes the development and maintenance of a public awareness and education program for the residents and workers in the area surrounding the Facility. Since this alternative would involve no contaminant removal, CERCLA requires that a Site subject to such a selected remedy be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative SC-2: Surface Excavation/Off-Site Treatment and Disposal/Capping

Capital cost: $1,257,100
O & M Cost: $32,700
Present Worth: $1,815,400
Time to Implement: 30 months

This alternative would involve the removal of the top 4 - 5 feet of contaminated soil from approximately 10,280 ft^2 of the open area (entire open area is 16,000 ft^2) of the Site. The total volume of excavated material is estimated to be 1,600 cubic yards. The excavated soil would be transported to an off-site permitted Resource Conservation and Recovery Act (RCRA) facility for treatment and disposal. For purposes of estimating cost for this alternative, as well as Alternatives SC-4 and SC-5, it is assumed that these soils would be treated via stabilization/ solidification. Off-site transport would comply with all federal and state transportation requirements. The excavated area would be filled with clean soil. The entire open area (16,000 ft^2) would then be graded and capped with a 6-inch asphalt cap, to prevent leaching of subsurface contaminants into the ground-water through infiltration. Since this alternative would result in contamination remaining on-site, five year reviews and long-term monitoring would be required.

Alternative SC-3: In-Situ Vacuum Extraction/In-Situ Stabilization (Solidification)/Soil Cover

Capital Cost: $1,965,600
O & M Cost: $27,200
Present Worth: $2,439,300
Time to Implement: 36 months

Under this alternative, the contaminated soil would be left in place, undisturbed; no excavation would be required. An in-situ vacuum extraction process would be employed over portions of the volatile organic contaminated area (2,500 ft^2) to remove the contaminants, mainly TCE, from the soil to 1 mg/kg. This process would involve the installation of approximately 5 vacuum extraction wells, each with a maximum depth of 30 feet. The vacuum wells would be connected via a piping system to a skid-mounted, high volume vacuum pump. The vacuum pump would pull air through the contaminated soils, within a radius of 20 feet from the wells, depending on soil composition and volatility of the contaminants. The air containing the stripped volatile organics would be fed through a condenser to remove moisture and then through an emissions control system, i.e., a vapor phase carbon adsorption system to remove volatilized organics.

While in-situ vacuum extraction is being applied to applicable portions of the Site, an in-situ stabilization process would begin in another portion of the Site and continue until the entire inorganic contamination has been immobilized. The approximate area of inorganic contamination varies from 10,280 ft^2 at the surface to 8,850 ft^2 at a 34-ft depth. The process would incorporate mechanical mixing and injection of reagents to immobilize both organic and inorganic contaminants. The stabilizing additives polymerize with the soils producing a cement-like mass. For each type of contaminated soil, the additives used varies and would have to be optimized. An on-site batch mixing tank supplies the proprietary chemical additives.

Once both processes are complete, a 6-inch cover of clean soil would then be placed over the entire yard area (16,000 ft^2). Since this alternative would result in contamination remaining on-site, five year reviews and long-term monitoring would be required.

Alternative SC-4: In-Situ Vacuum Extraction/Excavation/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil

Capital Cost: $8,974,600
O & M Cost: none
Present Worth: $8,974,600
Time to Implement: 42 months

This alternative is identical to Alternative SC-3 except that the contaminated soil in areas ranging rom 10,280 ft^2 at the surface to 8,850 ft^2 at a 34-ft depth of the contaminated yard area of the Site would be excavated and transported off-site for treatment and disposal. In-situ vacuum extraction would be conducted first in order to prevent exposure of workers and residents to volatile organics and to reduce organic contaminant levels such that only inorganics would require treatment off-site prior to disposal. Approximately 11,700 cubic yards of contaminated soil would be transported to an off-site RCRA permitted treatment and disposal facility. This total excavation amount is based on the assumption that all elevated levels of contaminants scattered throughout the Site would need to be excavated . The excavated area would be filled with clean soil, compacted and graded.

Alternative SC-5: In-Situ Vacuum Extraction/Surface Excavation/ Excavation of Leaching Pits/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil

Capital Cost: $1,777,410
O & M Cost: none
Present Worth: $1,777,410
Time to Implement: 36 months

This alternative is the same as Alternative SC-4 except that the amount of soil to be excavated would be different. After the in-situ vacuum extraction is conducted, the top 4 - 5 feet of the contaminated yard area of the Site would be excavated, resulting in approximately 1,600 cubic yards of material to be transported for off-site treatment and disposal. During the course of the initial excavation when the leaching pits or "hot spots" can be further delineated through additional borings and sampling, the excavation would continue until all contaminated soils were removed. The estimated amount of soil that would be excavated from the leaching pits is 480 cubic yards. This amount is based upon the leaching pits being between 12 - 18 feet in depth and 12 feet wide and assumes that soils within 2 feet of these parameters would also need to be excavated. The excavated areas would be backfilled with clean soil and the entire open area (16,000 ft^2) would then be graded.

Remedial Alternatives for Contaminated Groundwater (GW)

- ▲ GW-1: No-Action
- ▲ GW-2: Limited Action
- ▲ GW-3: Pumping/Metals Precipitation/Air Stripping/ Reinjection
- ▲ GW-4: Pumping/Metals Precipitation/Carbon Adsorption/ Reinjection
- ▲ GW-5: Pumping/Metals Precipitation/UV-Chemical Oxidation/ Reinjection
- ▲ GW-7: Pumping/Pretreatment/Discharge to Local Publically Owned Treatment Works (POTW)

Alternative GW-1: No-Action

Capital Cost: $65,500
O & M Cost: $26,900
Present Worth: $534,600
Time to Implement: 6 months

The No-Action alternative would only include a long-term monitoring program to sample the migration of contaminants of concern in the aquifer. The contaminants in the groundwater would be left to attenuate without any treatment. A total of twelve monitoring wells, including existing upgradient, Facility, and downgradient wells would be utilized in order to sample the groundwater from the shallow and deeper portions of the aquifer and to track contaminant migration. Regular five-year reviews would be performed to assess the need for additional remedial actions.

Alternative GW-2: Limited Action

Capital Cost: $99,300
O & M Cost: $29,700
Present Worth: $611,500
Time to Implement: 36 months

This alternative would include a long-term monitoring program, as described in Alternative GW-1, and also an institutional control program to restrict the use of the aquifer. The contaminants in the groundwater would be left to attenuate without any treatment. Institutional controls, such as well permit restrictions, would be implemented to limit the use of the aquifer downgradient of the Facility for both potable and municipal purposes. As with Alternative GW-1, regular five year reviews would be necessary to assess the need for further response actions.

<u>Alternative GW-3</u>: <u>Pumping/Metals Precipitation/Air Stripping/ Reinjection</u>

Capitol Cost: $971,500
O & M Cost: $191,100
Present Worth: $3,909,200
Time to Implement: 36 Months

The major features of this alternative would include groundwater collection, treatment, and reinjection of the treated groundwater and a performance monitoring program.

The collection system would consist of one extraction well to be installed at the southwestern corner of the Facility into the Upper Glacial Aquifer to a depth of approximately 70 feet in order to extract 28,800 gallons per day (gpd) of groundwater from the Site contaminant plume. The groundwater would then be piped to an on-site treatment facility consisting of two major process: treatment to remove metals by chemical precipitation, flocculation, clarification and filtration; and, air stripping followed by carbon adsorption to remove volatile organic contaminants. The treatment system would be designed to effectively reduce the metal concentrations in the treated groundwater below the federal and New York State groundwater standards. Any sludge generated during the metal removal process would be disposed of in a RCRA Subtitle C landfill. The spent carbon would be transported off-site for disposal or regeneration and reuse. The treated groundwater would then be reinjected into the aquifer through a reinjection well. The siting of the extraction and reinjection wells would be completed during the design phase based on technical criteria.

<u>Alternative GW-4</u>: <u>Pumping/Metals Precipitation/Carbon Adsorption/ Reinjeciton</u>

Capital Cost: $1,062,900
O & M Cost: $201,600
Present Worth: $4,162,000
Time to Implement: 36 Months

The major features of this alternative would be the same as that of Alternative GW-3. The unit processes used in this alternative are similar to those of Alternative GW-3 with the exception that the unit operation for organic removal would be achieved by a liquid phase carbon adsorption system rather than the air stripping system.

Alternative GW-5: Pumping/Metals Precipitation/UV-Chemical Oxidation/Reinjection

Capital Cost: $1,011,200
O & M Cost: $274,100
Present Worth: $5,224,800
Time to Implement: 36 months

The major features of this alternative would be the same as that of Alternative GW-3. The unit processes used in this alternative are similar to those of Alternative GW-3 with the exception that the unit operation for organic removal would be achieved by a UV-chemical oxidation system rather than the air stripping system used in Alternative GW-3 or the liquid phase carbon adsorption system used in Alternative GW-4. With a UV-chemical oxidation system, the groundwater would be mixed with a 50% hydrogen peroxide solution and then pumped to a 20 gpm UV-chemical oxidation reactor. The organic contaminants are converted to carbon dioxide (CO_2), water, and chlorides.

Alternative GW-7: Pumping/Pretreatment/Discharge to Local POTW

Capital Cost: $760,100
O & M Cost: $180,700
Present Worth: $3,537,900
Time to Implement: 42 months

The major features of this alternative would include groundwater collection, pretreatment, and discharge of the treated groundwater into the sewer line adjacent to the Site on Kalb Avenue which leads to the Bay Park Sewage Treatment Plant located 10 miles south of the Site. The unit process used in this alternative for the removal of heavy metals would be the same as that used in Alternative GW-3. The organic removal in this case is achieved by the activated sludge system (secondary wastewater treatment system) at the Bay Park Sewage Treatment Plant.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

All remedial alternatives were evaluated in detail utilizing nine criteria as set forth in the OSWER Directive 9355.3-01. These criteria were developed to address the requirements of Section 121 of CERCLA to ensure all important considerations are factored into remedy selection decisions.

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

Threshold Criteria
- ▲ Overall protection of human health and the environment; and
- ▲ Compliance with applicable or relevant and appropriate requirements to the extent practicable.

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

Primary Balancing Criteria
- ▲ Long-term effectiveness and permanence;
- ▲ Reduction in toxicity, mobility, or volume through treatment;
- ▲ Short-term effectiveness;
- ▲ Implementability; and
- ▲ Cost.

The following "modifying" criteria is considered fully after the formal public comment period on the Proposed Plan is complete:

Modifying Criteria
- ▲ State/support agency acceptance; and
- ▲ Community acceptance.

The nine criteria are summarized below:

1. Overall Protection of Human Health and the Environment

This criterion addresses whether or not a remedy provides adequate protection and describes how risks are eliminated, reduced or controlled through treatment, engineering controls, or institutional controls.

Protection of human health is the central mandate of CERCLA. Protection is achieved primarily by taking appropriate action to ensure that there will be no unacceptable risks to human health or the environment through any exposure pathways.

2. Compliance with ARARs

This criterion addresses whether or not a remedy will meet all applicable or relevant and appropriate requirements (ARARS') and/ or provide grounds for invoking waiver. ARARS can be chemical-specific, location-specific, or action-specific.

3. Long-term Effectiveness and Permanence

This criterion refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. Reduction of Toxicity, Mobility, or Volume

This evaluation criterion relates to the anticipated performance of a remedial technology, with respect of these parameters, that a remedy may employ.

5. Short-term Effectiveness

This criterion involves the period of time each alternative needs to achieve protection and any adverse impacts on human health and the environment that may be posed during construction and implementation of the alternative.

6. Implementability

This criterion involves the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

7. Cost

This criterion includes both estimated capital and operation and maintenance (O&M) costs. The present worth costs are based on a 30-year period and a 5% discount rate.

8. State/Support Agency Acceptance

This criterion assesses the technical and administrative issues and concerns the state may have regarding each of the alternatives. The factors to be evaluated includes features of the alternatives that the state supports, opposes, and any reservations the state may identify.

9. Community Acceptance

This criterion provides an assessment of any public concerns regarding any of the alternatives. Factors of community acceptance to be discussed include support, reservation, and opposition by the community.

Analysis

The discussion which follows provides a summary of the relative performance of each soil and groundwater alternative with respect to the nine criteria.

SOIL ALTERNATIVES

▲ Overall Protection of Human Health and the Environment

Alternative SC-1 does not meet the remedial objectives, thus it would not be protective of human health and the environment due to the continued migration of volatile organics and inorganics into the groundwater. Alternatives SC-2, SC-3, SC-4, and SC-5 would meet the remedial objective of protecting the groundwater from the source. However, Alternatives SC-3 through SC-5 would provide a more permanent solution to the problem since the protectiveness of Alternative SC-2 relies on the effectiveness of the asphalt cap. Alternative SC-2 would not meet the cleanup levels for prevention of cross-media impacts on the groundwater since only surface soil would be removed. Alternatives SC-3, SC-4, and SC-5 have the potential to meet the cleanup level for volatile organics. Alternative SC-3 can effectively immobilize the remaining contaminants. Alternative SC-5 would meet all cleanup levels once the leaching pits or "hot spots" of contaminated are further delineated. Alternative SC-4 can meet all the cleanup levels in the unsaturated soil since all of the contaminated soil would be remove from the Site. Alternatives SC-2, SC-3, SC-4 and SC-5 would protect nearby residents and workers by eliminating inhalation and direct contact pathways.

▲ Compliance with ARARS

All technologies proposed for use in Alternatives SC-2, SC-3, SC-4, and SC-5 would ne designed and implemented to satisfy all ARARs. However, Alternative SC-2 could result in cross-media contamination impacts on the groundwater through leaching of contaminants. Federal and state regulations dealing with the handling and transportation of hazardous wastes to an off-site treatment facility would be followed. Contaminated soil, debris, and sediments from the Site would be treated using specific technologies or specific treatment levels, as appropriate, to comply with RCRA Land Disposal Restrictions (LDRs). The residuals from the treatment processes (i.e., spent carbon) would also be treated and disposed of to comply with LDRs. This alternative will comply with LDRs through a treatability variance for the contaminated soil, debris, sediments, and residuals. (More detail can be found under the "Statutory Determinations" section).

▲ Long-term Effectiveness

Alternative SC-1 would only monitor the migration of the contaminants and would not provide treatment or containment. Therefore, it would not provide effective or permanent long-term protection of groundwater or human exposure to soils at the Site.

Alternatives SC-2, SC-3, SC-4, and SC-5 would mitigate the significant risks by partial or total removal and/or immobilization of Site contaminants. Alternatives SC-4 and SC-5 would provide the highest degree of effectiveness since all identified contaminated soils would be treated as well as removed from the Site. Alternatives SC-3 can effectively remove TCE from the soil through in-situ vacuum extraction and can effectively southeast, at Valley Stream State Park and Hempstead Lake State Park, respectively. The slope of the ground surface between the Site and these surface water bodies is less than 1 percent. The nearest wetland area is located approximately 3.0 miles to the southeast of the Site in Hempstead Lake State Park. There is no designated New York State significant habitat, agricultural land, nor historic or landmark site directly or potentially affected by conditions at the Site. There are no endangered species or critical habitats within close proximity of the Site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Genzale Plating Company, Inc. (the "Company") is an electroplating facility that has been in operation at this Site since 1915. Over time, the production activities and chemicals used in the electroplating process have changed. The earliest record of operations at the Genzale facility dates back to 1952. At that time, processing was reported to have involved anodizing and cadmium, zinc, and brass plating. In 1954 electroplating operations are on record as utilizing the following chemical compounds: copper, cyanide, silver cyanide, zinc cyanide, cadmium oxide, chromic acid, nickel sulfate, sulfuric acid, nitric acid, and alkali cleaners. The relative quantities of chemicals used at the Site during this period of time are unknown.

At present, the Company electroplates such products as automobile antennas and component parts; tops and bottoms of ball point pens; and housewares such as can and bottle openers. The electroplating process performed at the Site since 1959 involved a number of different steps which included the use of a variety of chemicals. The electroplating process is carried out by dipping and advancing the materials to be plated through a series of processing tanks or vats. Rinsing the metal parts between each processing tank generates wastewater which is discharged to the municipal sewer system for disposal. Previously, wastewater was discharged to the subsurface leaching pits located in the rear yard area of the Site. It should be noted, that wastewater was detected in three of the four leaching pits as recently as 1981. Distillation of spent solvent (1,1,1-trichloroethane) is presently in operation on the Site to condense out clean product for re-use. The sludge remaining from the distillation process is stored on-site for eventual removal.

In April 1981, the Nassau County Department of Health ("NCDH") conducted an inspection of the Genzale facility. During this inspection, NCDH noted that industrial wastewater from the plating facility was being discharged to at least three of four on-site leaching pits. NCDH representatives instructed Company personnel to discontinue discharge to the leaching pits at that time. In addition, wastewater samples were obtained from the leaching pits by NCDH and submitted for laboratory analysis of inorganic compounds only. The results indicated that the wastewater samples exhibited heavy metal concentrations in excess of New York State Department of Environmental Conservation ("NYSDEC") discharge standards.

In March 1982, the Company's owners contracted Gamma TEC Consulting Engineers to excavate potentially contaminated materials from the leaching pits. An estimated total of 36 cubic yards of material was removed from three of the leaching pits at the Facility. Due to a lack of financial resources available to the Company, leaching pit excavation was not completed.

Woodward-Clyde Consultants, Inc. ("WCCI") performed a site survey in April 1983, under contract to the NYSDEC. WCCI concluded that contaminant transport from the Site presented a "relatively low", yet potential public health threat due to the Site's proximity to a number of public water supply wells. The nearest supply well is approximately 1300 feet east of the Site. In June 1986, the Site was added to the EPA National Priorities List of Superfund sites.

A special notice letter was issued to the Company on December 31, 1987 by the EPA. Based upon the Company's response it was determined that it was financially unable to conduct the investigative activities at the Site. Accordingly, EPA proceeded with the Remedial Investigation and Feasibility Study ("RI/FS"). A work plan for the RI/FS was completed in October 1988, however field work could not be initiated due to problems obtaining access. In August 1989, EPA issued an Access Order to the Genzale Plating Company so that field work could commence. As a result of the Company's failure to comply, EPA sought and was granted a court ruling in October 1989 which enforced the terms of the Order. Field work for the RI/FS began in November 1989 and was completed in February 1990.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

A Community Relations Plan for the Site was finalized in November 1988. This document lists contacts and interested parties throughout government and the local community. It also established communication pathways to ensure timely dissemination of pertinent information. Subsequently, a factsheet outlining the RI sampling program was distributed in November 1989 and a public availability session was held on November 21, 1989 to answer questions.

The RI/FS reports and the Proposed Plan for the Site were released to the public on February 22, 1991. These documents were made available to the public in both the administrative record file and the information repositories maintained at the EPA Record Center room in Region 2 and at the Franklin Square Library. A press release concerning the availability of the RI/FS reports, the Proposed Plan, and the initiation of the public comment period was issued on February 22, 1991. A public notice was published in a local newspaper which provided a 30-day public comment period, ending on March 23, 1991. In addition, a public meeting was held on March 13, 1991 at which representatives from EPA and NYSDEC answered questions about the problems at the Site and remedial alternatives under consideration. All comments which were received by EPA prior to the end of the public comment period, including those expressed verbally at the public meeting, are addressed in the Responsiveness Summary which is attached, as Appendix E, to this Record of Decision.

This decision document presents the selected remedial action for the Genzale Plating Company site, in Franklin Square, New York, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), as amended, and to the extent practicable, the National Contingency Plan. The decision for this Site is based on the administrative record.

SCOPE AND ROLE OF RESPONSE ACTION

The areas of concern addressed by this response action include soils and groundwater in the vicinity of the Facility. These areas of the Site pose the principal threat to human health and the environment because of risk from possible ingestion, inhalation, or dermal contact with the soils and/or groundwater. Although the results of the RI/FS indicate the need for an interim groundwater remedial action, EPA was unable to delineate the extent of the groundwater plume beyond the Facility property. An additional investigation of the nature and extent of the plume will be initiated under a second operable unit. The purpose of this interim groundwater remedy is to work toward the overall goal of aquifer restoration, but it does not constitute the final action for groundwater.

The overall objective of this response action is to reduce the concentrations of contaminants in the on-site soils to levels which are protective of human health and the environment, to reduce the concentrations of contaminated groundwater underlying the Facility in order to reduce the risk associated with the contaminants, and to prevent further deterioration of the area groundwater.

SUMMARY OF SITE CHARACTERISTICS

Previous investigations and the RI (Ebasco, 1991) have shown that there were discharges of untreated process wastewater to leaching pits located in the rear yard area of the Site. Media sampled during the remedial investigation included surface soils, subsurface soils, and groundwater.

Groundwater

Two rounds of unfiltered groundwater samples were collected from eight monitoring wells, six installed at the Facility and two installed downgradient of the Facility, four water supply wells, one County monitoring well, and one private irrigation well. The locations of the monitoring wells at the Facility and the downgradient wells are shown on Figures 2 and 3, respectively. The wells at the Facility were installed and screened in both shallow (30 - 40 ft below surface) and deep (60 - 70 feet below surface) portions of the Upper Glacial Aquifer. Groundwater level measurements obtained from the newly installed wells indicated that groundwater generally occurred 32 - 36 feet below the surface. Exceedingly high contaminant values were consistently detected in shallow wells located at the Facility. The four volatile organic compounds which were most abundant from both a concentration and frequency of occurrence basis include: trichloroethene (TCE), 1,1,1-trichloroethane (TCA), 1,1-dichloroethene (DCE), and tetrachloroethene (PCE). TCA and TCE were present at the greatest concentrations in the groundwater underlying the Facility (1,100 and 500 parts per billion, respectively). Inorganics such as chromium, nickel, copper, cadmium, manganese, and iron were also detected. Maximum concentration levels of primary contaminants of concern in the groundwater can be found in Table 1.

Surface/Subsurface Soils

The soil sampling program involved the determination of lateral and vertical extents of contamination by obtaining samples from seven surface soil locations, six soil borings, two leaching pit borings, and three monitoring well borings. All soil sampling locations are depicted on Figure 4. Many of the contaminants found in the soils were the same as those found in the groundwater. Table 2 lists the overall maximum, average, and minimum concentrations of contaminants detected in the on-site soils.

The surface soils were sampled between a depth of 0 - 2 feet below grade. Inorganic compound concentrations exceeding regional background levels were detected at almost all surface soil locations sampled. Typical background concentration levels of inorganic compounds are shown on Table 3. Inorganic compounds consistently detected at elevated levels include: chromium, copper, lead, nickel, and zinc. The highest concentration of most, if not all, inorganic compounds at the surface were detected at boring location SB-06. This boring was advanced directly through a former leaching pit. Maximum surface concentrations at SB-06 include chromium at 14,800 mg/kg (background (bg) 10 - 80 mg/kg), nickel at 46,400 mg/kg (bg 4 -30 mg/kg), lead at 1,440 mg/kg (bg 3 - 30 mg/kg), and copper at 11,200 mg/kg (bg 2 - 100 mg/kg). The highest values of volatile organics in surface soils were also detected in samples located at SB-06. The maximum concentration of TCE detected at 0 - 2 feet is reported at 120 ug/kg.

Inorganic compounds consistently detected at elevated values in subsurface soils include: chromium, nickel, lead, and to a lesser extent, copper and cadmium. The highest concentrations of these compounds are generally detected in subsurface soils of sampling locations SB-06, SB-04, SB-05, and SB-02. In general, inorganic compound concentrations decrease with depth from maximum values exhibited at (0 - 2 feet) or near (approximately 5 feet below grade) the surface. The maximum chromium value detected at the Site was 27,300 mg/kg in SB-06 at a depth of 2 - 4 feet. High levels of chromium, nickel, and lead were detected in locations SB-05 and SB-02 occurring at depths of 10 and 30 feet, respectively. The distribution of organic contaminants and the concentrations at which they occur in subsurface soil vary greatly upon location. Volatile organics detected most frequently include TCE and TCA (maximum concentrations of 53 and 7 mg/kg, respectively).

The volume of soil contaminated by organic compounds is estimated to be 3,150 cubic yards. The areas of organic contamination, approximately 2500 square feet, are depicted on Figure 5. Most of the inorganic contamination was detected in the top 4 - 5 feet of the Site, resulting in approximately 1,600 cubic yards of contaminated soil, with the exception of inorganic contamination as deep as 40 feet below grade related to the former leaching pits. The estimated amount of this deeper inorganic contamination is 480 cubic yards. This amount is based upon the leaching pits being between 12 - 18 feet in depth and 12 feet in width and assumes that soils within roughly 2 feet of these parameters would also require excavation.

SUMMARY OF SITE RISKS

A baseline risk assessment was developed as part of the remedial investigation for the Site. The risk assessment evaluates the potential impacts on human health and the environment if the contamination at the Site is not remediated. The assessment also anticipates potential future uses for the Site. This information is used by EPA to make a determination as to whether remediation of the Site is required.

Two scenarios were developed based on current (industrial) and possible future (residential) land use at the Facility. Under both scenarios, several pathways (direct contact, inhalation and ingestion) were evaluated for exposure to surface and subsurface soils, air, and groundwater used for drinking and domestic purposes. The populations evaluated included nearby residents, current and future on-site workers, future on-site development workers, and future on-site adult and child residents. An exposure assessment was conducted to estimate the magnitude, frequency, and duration of actual and/or potential exposures to the chemicals of potential concern via all pathways by which humans are potentially exposed. Exposures were based on reasonable maximum concentrations, calculated as the 95th percentile upper confidence limit of the geometric mean. This reasonable maximum exposure is defined as the highest exposure that is reasonably expected to occur at the Site for individual and combined pathways.

Based on the evaluations performed during the risk assessment, the contaminants which are likely to pose the most significant risks to human health and the environment (i.e., chemicals of concern) were identified for the soil and groundwater. The chemicals concern in the soil are cadmium, chromium, nickel, barium, lead, copper, arsenic, trichloroethene, bis (2-ethylhexyl) phthalate, and chrysene. The chemicals of concern in the groundwater are trichloroethene, 1,1,1-trichloroethane, 1,1-dichlorcethene, tetrachloroethene, cadmium, chromium, copper, lead, and nickel. The maximum concentrations of these contaminants are provided in Table 1. All levels of primary contaminants detected in the groundwater exceeded federal and/or state drinking water standards.

Under current EPA guidelines, the likelihood of carcinogenic (cancer causing) and noncarcinogenic (non-cancer) effects due to exposure to site chemicals are considered separately. EPA considers carcinogenic risk in the range of 10^{-4} to 10^{-6} to be acceptable. This risk range can be interpreted to mean that an individual may have a one-in-ten-thousand to a one-in-a-million increased chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the Site.

Potential carcinogenic risks were evaluated using the cancer potency factors developed by the EPA for the chemicals of concern. Cancer potency factors ("CPF"s) have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at the intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes the underestimation of the risk highly unlikely. CPFs for chemicals of potential concern can be found on Table 4.

EPA's baseline risk assessment indicates that the most significant public health risk results from the ingestion of groundwater, inhalation of groundwater volatiles (i.e., while showering), and direct contact and ingestion of soils. Table 5 summarizes the baseline risk assessment results. Under the future-use scenario, ingestion of groundwater in the vicinity of the Facility by off-Facility adult residents would present an excess cancer risk of 2.56 x 10^{-3}; ingestion of groundwater by on-Facility adult residents would present an excess cancer risk of 2.55 x 10^{-3} and for on-Facility child residents an excess cancer risk of 1.7 x 10^{-3}. This indicates that future off-Facility and on-Facility adults have approximately a three-in-one-thousand additional chance of developing cancer, and on-Facility children have a two-in-one-thousand additional chance of developing cancer, as a result of drinking this groundwater. Under the future-use scenario for on-Facility development workers, inhalation of the Site soils during construction activity would present an excess cancer risk of 9.96 x 10^{-4}. This indicates that an on-Facility worker involved in construction and excavation activities would have approximately a one-in-one-thousand additional chance of developing cancer.

The non-cancer risk associated with different pathways was assessed using a hazard index ("HI") approach, based on comparison of expected contaminant intakes and safe levels of intake (reference doses). Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects. The chronic and subchronic RfDs for chemicals of potential concern can be found on Table 4. RfDs, which are expressed in units of milligram per kilogram per day (mg/kg-day), are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated soil) are compared with the RfD to derive the hazard quotient for the contaminant in the particular media. The HI is obtained by adding the hazard quotients for all compounds across all media. An HI value greater than 1.0 is considered to pose an unacceptable non-cancer risk. Under the current-use worker scenario, inhalation and ingestion of Site soils contributes to an HI of 2.2. Under the future-use scenario, ingestion of groundwater for off-Facility adult residents presents an HI value of 86.2; ingestion of groundwater for on-Facility adult residents presents and HI value of 86.2 and for on-Facility child residents an HI of 114; ingestion and dermal contact with soils for on-Facility adult residents contributes to an HI value of 2.56 and for on-Facility child residents an HI of 15.4; ingestion and dermal contact with Site soils by future on-Facility workers presents and HI of 2.2 and for future Site development workers an HI of 23.9. For soil pathways, the chemicals of concern which contribute the most to the HI values are chromium and nickel. For groundwater pathways, the largest chemical contributors are antimony, chromium, and nickel.

The risk assessment contains the conclusion that inhalation of Site soils by current off-Facility residents does not present a non-cancer risk nor an excess cancer risk.

In summary, it is evident that the contaminants in soils at the Facility and underlying groundwater warrant remediation in order to prevent the continued degradation of groundwater quality in the area and to reduce their associated risks.

Uncertainties

The procedures used to assess potential human health risks in this evaluation are subject to wide uncertainties. In general, the main sources of uncertainty in this assessment include:

- environmental chemistry sampling and analysis;
- exposure models and assumptions; and
- toxicological models and parameters.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled. Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come into contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemical so concern at the point of exposure. Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making very conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

Actual or threatened releases of hazardous substances from this Site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to the environment through the groundwater pathway.

DESCRIPTION OF ALTERNATIVES

Following a screening of remedial technologies in accordance with the NCP, five remedial alternatives were developed for contaminated groundwater and six for contaminated soil. The alternatives were further screened based on technical considerations such as effectiveness, implementability, and cost. The present worth costs listed below for all soil and groundwater alternatives are based on a 30-year period and a 5% discount rate.

Remedial Alternatives for Contaminated Soils (SC)

- ▲ SC-1: No-Action
- ▲ SC-2: Surface Excavation/Off-Site Treatment and Disposal/Capping
- ▲ SC-3: In-Situ Vacuum Extraction/In-Situ Stabilization (Solidification)/Soil Cover
- ▲ SC-4: In-Situ Vacuum Extraction/Excavation/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil
- ▲ SC-5: In-Situ Vacuum Extraction/Surface Excavation/ Excavation of Leaching Pits/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil

<u>Alternative SC-1</u>: <u>No-Action</u>

Capital Cost: $ 65,600
Annual Operation & Maintenance (O & M) Cost: $34,400
Present Worth Cost: $650,000
Time to Implement: 6 months

CERCLA requires that the No-Action alternative be considered as a baseline for comparison with other soil alternatives. Under this alternative, the contaminated soil would be left in place without treatment. A long-term monitoring program would be implemented to track the migration of contaminants from the soil into the groundwater utilizing existing monitoring well clusters as well as a total of 10 newly installed cluster wells. This alternative also includes the development and maintenance of a public awareness and education program for the residents and workers in the area surrounding the Facility. Since this alternative would involve no contaminant removal, CERCLA requires that a Site subject to such a selected remedy be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

<u>Alternative SC-2</u>: <u>Surface Excavation/Off-Site Treatment and Disposal/Capping</u>

Capital cost: $1,257,100
O & M Cost: $32,700
Present Worth: $1,815,400
Time to Implement: 30 months

This alternative would involve the removal of the top 4 - 5 feet of contaminated soil from approximately 10,280 ft^2 of the open area (entire open area is 16,000 ft^2) of the Site. The total volume of excavated material is estimated to be 1,600 cubic yards. The excavated soil would be transported to an off-site permitted Resource Conservation and Recovery Act (RCRA) facility for treatment and disposal. For purposes of estimating cost for this alternative, as well as Alternatives SC-4 and SC-5, it is assumed that these soils would be treated via stabilization/ solidification. Off-site transport would comply with all federal and state transportation requirements. The excavated area would be filled with clean soil. The entire open area (16,000 ft^2) would then be graded and capped with a 6-inch asphalt cap, to prevent leaching of subsurface contaminants into the ground-water through infiltration. Since this alternative would result in contamination remaining on-site, five year reviews and long-term monitoring would be required.

Alternative SC-3: In-Situ Vacuum Extraction/In-Situ Stabilization (Solidification)/Soil Cover

Capital Cost: $1,965,600
O & M Cost: $27,200
Present Worth: $2,439,300
Time to Implement: 36 months

Under this alternative, the contaminated soil would be left in place, undisturbed; no excavation would be required. An in-situ vacuum extraction process would be employed over portions of the volatile organic contaminated area (2,500 ft^2) to remove the contaminants, mainly TCE, from the soil to 1 mg/kg. This process would involve the installation of approximately 5 vacuum extraction wells, each with a maximum depth of 30 feet. The vacuum wells would be connected via a piping system to a skid-mounted, high volume vacuum pump. The vacuum pump would pull air through the contaminated soils, within a radius of 20 feet from the wells, depending on soil composition and volatility of the contaminants. The air containing the stripped volatile organics would be fed through a condenser to remove moisture and then through an emissions control system, i.e., a vapor phase carbon adsorption system to remove volatilized organics.

While in-situ vacuum extraction is being applied to applicable portions of the Site, an in-situ stabilization process would begin in another portion of the Site and continue until the entire inorganic contamination has been immobilized. The approximate area of inorganic contamination varies from 10,280 ft^2 at the surface to 8,850 ft^2 at a 34-ft depth. The process would incorporate mechanical mixing and injection of reagents to immobilize both organic and inorganic contaminants. The stabilizing additives polymerize with the soils producing a cement-like mass. For each type of contaminated soil, the additives used varies and would have to be optimized. An on-site batch mixing tank supplies the proprietary chemical additives.

Once both processes are complete, a 6-inch cover of clean soil would then be placed over the entire yard area (16,000 ft^2). Since this alternative would result in contamination remaining on-site, five year reviews and long-term monitoring would be required.

Alternative SC-4: In-Situ Vacuum Extraction/Excavation/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil

Capital Cost: $8,974,600
O & M Cost: none
Present Worth: $8,974,600
Time to Implement: 42 months

This alternative is identical to Alternative SC-3 except that the contaminated soil in areas ranging rom 10,280 ft^2 at the surface to 8,850 ft^2 at a 34-ft depth of the contaminated yard area of the Site would be excavated and transported off-site for treatment and disposal. In-situ vacuum extraction would be conducted first in order to prevent exposure of workers and residents to volatile organics and to reduce organic contaminant levels such that only inorganics would require treatment off-site prior to disposal. Approximately 11,700 cubic yards of contaminated soil would be transported to an off-site RCRA permitted treatment and disposal facility. This total excavation amount is based on the assumption that all elevated levels of contaminants scattered throughout the Site would need to be excavated . The excavated area would be filled with clean soil, compacted and graded.

Alternative SC-5: In-Situ Vacuum Extraction/Surface Excavation/ Excavation of Leaching Pits/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil

Capital Cost: $1,777,410
O & M Cost: none
Present Worth: $1,777,410
Time to Implement: 36 months

This alternative is the same as Alternative SC-4 except that the amount of soil to be excavated would be different. After the in-situ vacuum extraction is conducted, the top 4 - 5 feet of the contaminated yard area of the Site would be excavated, resulting in approximately 1,600 cubic yards of material to be transported for off-site treatment and disposal. During the course of the initial excavation when the leaching pits or "hot spots" can be further delineated through additional borings and sampling, the excavation would continue until all contaminated soils were removed. The estimated amount of soil that would be excavated from the leaching pits is 480 cubic yards. This amount is based upon the leaching pits being between 12 - 18 feet in depth and 12 feet wide and assumes that soils within 2 feet of these parameters would also need to be excavated. The excavated areas would be backfilled with clean soil and the entire open area (16,000 ft^2) would then be graded.

Remedial Alternatives for Contaminated Groundwater (GW)

- GW-1: No-Action
- GW-2: Limited Action
- GW-3: Pumping/Metals Precipitation/Air Stripping/ Reinjection
- GW-4: Pumping/Metals Precipitation/Carbon Adsorption/ Reinjection
- GW-5: Pumping/Metals Precipitation/UV-Chemical Oxidation/ Reinjection
- GW-7: Pumping/Pretreatment/Discharge to Local Publically Owned Treatment Works (POTW)

Alternative GW-1: No-Action

Capital Cost: $65,500
O & M Cost: $26,900
Present Worth: $534,600
Time to Implement: 6 months

The No-Action alternative would only include a long-term monitoring program to sample the migration of contaminants of concern in the aquifer. The contaminants in the groundwater would be left to attenuate without any treatment. A total of twelve monitoring wells, including existing upgradient, Facility, and downgradient wells would be utilized in order to sample the groundwater from the shallow and deeper portions of the aquifer and to track contaminant migration. Regular five-year reviews would be performed to assess the need for additional remedial actions.

Alternative GW-2: Limited Action

Capital Cost: $99,300
O & M Cost: $29,700
Present Worth: $611,500
Time to Implement: 36 months

This alternative would include a long-term monitoring program, as described in Alternative GW-1, and also an institutional control program to restrict the use of the aquifer. The contaminants in the groundwater would be left to attenuate without any treatment. Institutional controls, such as well permit restrictions, would be implemented to limit the use of the aquifer downgradient of the Facility for both potable and municipal purposes. As with Alternative GW-1, regular five year reviews would be necessary to assess the need for further response actions.

Alternative GW-3: Pumping/Metals Precipitation/Air Stripping/ Reinjection

Capitol Cost: $971,500
O & M Cost: $191,100
Present Worth: $3,909,200
Time to Implement: 36 Months

The major features of this alternative would include groundwater collection, treatment, and reinjection of the treated groundwater and a performance monitoring program.

The collection system would consist of one extraction well to be installed at the southwestern corner of the Facility into the Upper Glacial Aquifer to a depth of approximately 70 feet in order to extract 28,800 gallons per day (gpd) of groundwater from the Site contaminant plume. The groundwater would then be piped to an on-site treatment facility consisting of two major process: treatment to remove metals by chemical precipitation, flocculation, clarification and filtration; and, air stripping followed by carbon adsorption to remove volatile organic contaminants. The treatment system would be designed to effectively reduce the metal concentrations in the treated groundwater below the federal and New York State groundwater standards. Any sludge generated during the metal removal process would be disposed of in a RCRA Subtitle C landfill. The spent carbon would be transported off-site for disposal or regeneration and reuse. The treated groundwater would then be reinjected into the aquifer through a reinjection well. The siting of the extraction and reinjection wells would be completed during the design phase based on technical criteria.

Alternative GW-4: Pumping/Metals Precipitation/Carbon Adsorption/ Reinjeciton

Capital Cost: $1,062,900
O & M Cost: $201,600
Present Worth: $4,162,000
Time to Implement: 36 Months

The major features of this alternative would be the same as that of Alternative GW-3. The unit processes used in this alternative are similar to those of Alternative GW-3 with the exception that the unit operation for organic removal would be achieved by a liquid phase carbon adsorption system rather than the air stripping system.

Alternative GW-5: Pumping/Metals Precipitation/UV-Chemical Oxidation/Reinjection

Capital Cost: $1,011,200
O & M Cost: $274,100
Present Worth: $5,224,800
Time to Implement: 36 months

The major features of this alternative would be the same as that of Alternative GW-3. The unit processes used in this alternative are similar to those of Alternative GW-3 with the exception that the unit operation for organic removal would be achieved by a UV-chemical oxidation system rather than the air stripping system used in Alternative GW-3 or the liquid phase carbon adsorption system used in Alternative GW-4. With a UV-chemical oxidation system, the groundwater would be mixed with a 50% hydrogen peroxide solution and then pumped to a 20 gpm UV-chemical oxidation reactor. The organic contaminants are converted to carbon dioxide (CO_2), water, and chlorides.

Alternative GW-7: Pumping/Pretreatment/Discharge to Local POTW

Capital Cost: $760,100
O & M Cost: $180,700
Present Worth: $3,537,900
Time to Implement: 42 months

The major features of this alternative would include groundwater collection, pretreatment, and discharge of the treated groundwater into the sewer line adjacent to the Site on Kalb Avenue which leads to the Bay Park Sewage Treatment Plant located 10 miles south of the Site. The unit process used in this alternative for the removal of heavy metals would be the same as that used in Alternative GW-3. The organic removal in this case is achieved by the activated sludge system (secondary wastewater treatment system) at the Bay Park Sewage Treatment Plant.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

All remedial alternatives were evaluated in detail utilizing nine criteria as set forth in the OSWER Directive 9355.3-01. These criteria were developed to address the requirements of Section 121 of CERCLA to ensure all important considerations are factored into remedy selection decisions.

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

Threshold Criteria

- ▲ Overall protection of human health and the environment; and
- ▲ Compliance with applicable or relevant and appropriate requirements to the extent practicable.

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

Primary Balancing Criteria

- ▲ Long-term effectiveness and permanence;
- ▲ Reduction in toxicity, mobility, or volume through treatment;
- ▲ Short-term effectiveness;
- ▲ Implementability; and
- ▲ Cost.

The following "modifying" criteria is considered fully after the formal public comment period on the Proposed Plan is complete:

Modifying Criteria

- ▲ State/support agency acceptance; and
- ▲ Community acceptance.

The nine criteria are summarized below:

1. Overall Protection of Human Health and the Environment

This criterion addresses whether or not a remedy provides adequate protection and describes how risks are eliminated, reduced or controlled through treatment, engineering controls, or institutional controls.

Protection of human health is the central mandate of CERCLA. Protection is achieved primarily by taking appropriate action to ensure that there will be no unacceptable risks to human health or the environment through any exposure pathways.

2. Compliance with ARARs

This criterion addresses whether or not a remedy will meet all applicable or relevant and appropriate requirements (ARARS') and/ or provide grounds for invoking waiver. ARARS can be chemical-specific, location-specific, or action-specific.

3. Long-term Effectiveness and Permanence

This criterion refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. Reduction of Toxicity, Mobility, or Volume

This evaluation criterion relates to the anticipated performance of a remedial technology, with respect of these parameters, that a remedy may employ.

5. Short-term Effectiveness

This criterion involves the period of time each alternative needs to achieve protection and any adverse impacts on human health and the environment that may be posed during construction and implementation of the alternative.

6. Implementability

This criterion involves the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

7. Cost

This criterion includes both estimated capital and operation and maintenance (O&M) costs. The present worth costs are based on a 30-year period and a 5% discount rate.

8. State/Support Agency Acceptance

This criterion assesses the technical and administrative issues and concerns the state may have regarding each of the alternatives. The factors to be evaluated includes features of the alternatives that the state supports, opposes, and any reservations the state may identify.

9. Community Acceptance

This criterion provides an assessment of any public concerns regarding any of the alternatives. Factors of community acceptance to be discussed include support, reservation, and opposition by the community.

Analysis

The discussion which follows provides a summary of the relative performance of each soil and groundwater alternative with respect to the nine criteria.

SOIL ALTERNATIVES

▲ Overall Protection of Human Health and the Environment

Alternative SC-1 does not meet the remedial objectives, thus it would not be protective of human health and the environment due to the continued migration of volatile organics and inorganics into the groundwater. Alternatives SC-2, SC-3, SC-4, and SC-5 would meet the remedial objective of protecting the groundwater from the source. However, Alternatives SC-3 through SC-5 would provide a more permanent solution to the problem since the protectiveness of Alternative SC-2 relies on the effectiveness of the asphalt cap. Alternative SC-2 would not meet the cleanup levels for prevention of cross-media impacts on the groundwater since only surface soil would be removed. Alternatives SC-3, SC-4, and SC-5 have the potential to meet the cleanup level for volatile organics. Alternative SC-3 can effectively immobilize the remaining contaminants. Alternative SC-5 would meet all cleanup levels once the leaching pits or "hot spots" of contaminated are further delineated. Alternative SC-4 can meet all the cleanup levels in the unsaturated soil since all of the contaminated soil would be remove from the Site. Alternatives SC-2, SC-3, SC-4 and SC-5 would protect nearby residents and workers by eliminating inhalation and direct contact pathways.

▲ <u>Compliance with ARARS</u>

All technologies proposed for use in Alternatives SC-2, SC-3, SC-4, and SC-5 would ne designed and implemented to satisfy all ARARs. However, Alternative SC-2 could result in cross-media contamination impacts on the groundwater through leaching of contaminants. Federal and state regulations dealing with the handling and transportation of hazardous wastes to an off-site treatment facility would be followed. Contaminated soil, debris, and sediments from the Site would be treated using specific technologies or specific treatment levels, as appropriate, to comply with RCRA Land Disposal Restrictions (LDRs). The residuals from the treatment processes (i.e., spent carbon) would also be treated and disposed of to comply with LDRs. This alternative will comply with LDRs through a treatability variance for the contaminated soil, debris, sediments, and residuals. (More detail can be found under the "Statutory Determinations" section).

▲ <u>Long-term Effectiveness</u>

Alternative SC-1 would only monitor the migration of the contaminants and would not provide treatment or containment. Therefore, it would not provide effective or permanent long-term protection of groundwater or human exposure to soils at the Site.

Alternatives SC-2, SC-3, SC-4, and SC-5 would mitigate the significant risks by partial or total removal and/or immobilization of Site contaminants. Alternatives SC-4 and SC-5 would provide the highest degree of effectiveness since all identified contaminated soils would be treated as well as removed from the Site. Alternatives SC-3 can effectively remove TCE from the soil through in-situ vacuum extraction and can effectively immobilize the remaining contaminants: although the long-term integrity of the stabilized soil matrix is unknown, maintenance of the soil cover over the stabilized soil would help ensure that future leaching does not occur. Alternative SC-2 may not be as effective as Alternatives SC-3, SC-4, and SC-5 because it would leave contaminants in-place without treatment and relies on the integrity of the asphalt cap to prevent further migration and cross-media impacts on the groundwater.

▲ <u>Reduction in Toxicity, Mobility, or Volume</u>

Alternative SC-1 would provide a very slow and gradual reduction in toxicity through natural attenuation. It would provide no reduction in contaminant mobility. Alternative SC-2 would provide a reduction in mobility of surface soil contaminants via removal and off-site stabilization and in subsurface contaminants by Site capping, but does not reduce the toxicity of the subsurface soils.

Alternatives SC-3, SC-4, and SC-5 again are similar, in that each would result in significant reductions in the toxicity, mobility, and volume of the treated material. Material toxicity would be reduced by removal and in-situ vacuum extraction of TCE and other volatile organics under Alternatives SC-3, SC-4, and SC-5. Contaminant mobility would be reduced in Alternative SC-3 by in-situ stabilization and a soil cover over the treated soil. Alternatives SC-4 and SC-5 would provide for reduction in toxicity, mobility, and volume through removal of all contaminated soil. Volume increases resulting from stabilization of metal contaminated soil would be minimal in SC-3.

▲ <u>Short-term Effectiveness</u>

The implementation of Alternative SC-1 would result in no additional risk to the community or workers during implementation, since subsurface soil would not be disturbed. Alternatives SC-2, SC-4, and SC-5 would include activities such as contaminated soil excavation and off-site transport or on-site treatment that could result in potential exposure of residents and workers to volatilized contaminants and contaminated dust. Engineering controls and other measures (e.g., restricting access to the site to authorized personnel only) would effectively eliminate any impact these activities would have on nearby residents. Alternatives SC-3 would include in-situ treatment of contaminated soils, so exposure risk to workers and residents from excavation would be minimal. Under Alternatives SC-3, SC-4, and SC-5, proper air emission control units would be installed to minimize the potential for public health exposures because of low-level emissions from on-site treatment units.

Alternative SC-1 would be implemented in approximately 30 months. Alternatives SC-2, SC-3, SC-4, and SC-5 would be designed and constructed in roughly 2 years with actual remediation to follow, resulting in full implementation time frames of approximately 6, 12, 18, and 12 months, respectively.

▲ Implementability

Components of all alternatives would utilize relatively common construction equipment and materials. Although implementable, some construction difficulty would be encountered with Alternatives SC-2, SC-3, SC-4, and SC-5 because of the limited Facility space available for equipment staging and material handling. Alternative SC-3 would not have a space problem since no excavation and stockpiling would be required. Alternative SC-4 would involve maximum excavation and would require the largest work area. Alternative SC-1 would be the easiest to implement.

A degree of uncertainty exists with the in-situ processes called for in Alternatives SC-3, SC-4, and SC-5, since these technologies have only been performed on a limited full-scale basis at similar contaminant concentration levels. However, the physical nature of the soils at the Site appear to be optimum for the in-situ vacuum extraction process.

▲ Cost

According to the present worth cost estimates for all alternatives evaluated, Alternative SC-4 ($8,974,600) would be the most costly alternative to implement, followed by Alternatives SC-3, SC-2, and SC-5. Alternative SC-1, no action, would be the least costly to implement. Present worth considers a 5% discount rate, and a 30-year operational period for Alternatives SC-1, SC-2, SC-3, and SC-5. Since Alternatives SC-4 and SC-5 do not require any O & M cost, their present worth costs are equivalent to their capital costs. The present worth cost estimates for the alternatives evaluated are as follows:

SC-1:	$ 650,000
SC-2:	1,815,400
SC-3:	2,439,300
SC-4:	8,974,600
SC-5:	1,777,410

Alternative SC-5 is protective and permanently treats the principal threats posed by the Site at a cost of $1,777,410, which is much less than Alternative SC-4.

▲ Community Acceptance

No objections from the community were raised regarding the selected soil remedy. A responsiveness summary which addresses all comments received during the public comment period, including the March 13, 1991 public meeting, is attached as Appendix IV.

▲ State Acceptance

The State of New York, through the NYSDEC, has concurred with EPA's selected remedy. The NYSDEC letter of concurrence is attached as Appendix III.

GROUNDWATER ALTERNATIVES

▲ Overall Protection of Human Health and the Environment

Alternatives GW-1 and GW-2 would not provide protection of human health and the environment. Existing groundwater contamination would continue to degrade the aquifer and downgradient groundwater.

Alternatives GW-3, GW-4, GW-5 and GW-7 would be much more protective of human health and the environment than Alternatives GW-1 and GW-2 since they would be directed at reducing the toxicity, mobility, and volume of contaminants in the aquifer and protecting downgradient groundwater from further contamination.

▲ Compliance with ARARs

Alternatives GW-1 and GW-2 would not comply with federal or state drinking water standards or criteria or those ARARs required for protection of the groundwater resources. Neither alternative would achieve ARARs.

The design of Alternatives GW-3, GW-4, and GW-5 would be performed to permit achievement of chemical-specific ARARs for drinking water and those required for groundwater protection in the treated water stream. Alternative GW-7 would be in compliance with a discharge permit to a POTW. Each of these alternatives would be capable of providing the required contaminant removal levels. Because UV-chemical oxidation (Alternative GW-5) experience is limited, its effectiveness is slightly less certain but considered achievable. Groundwater protection criteria would not be met at all points of the aquifer immediately upon implementation of any of the alternatives. A second operable unit groundwater investigation would be required to determine the need for potential remediation of the downgradient portion of the plume.

The residuals from the treatment processes (i.e., spent carbon) would also be treated and disposed of to comply with LDRs. This alternative will comply with LDRs through a treatability variance for the spent carbon.

▲ Long-term Effectiveness and Permanence

Alternatives GW-1 and GW-2 would not provide treatment, but Alternative GW-2 would restrict the use of the contaminated aquifer for private and municipal purposes. Neither alternative would restore the contaminated aquifer for future use.

Alternatives GW-3, GW-4, GW-5, and GW-7 would all function to reduce the potential risk associated with groundwater ingestion by extracting and treating the groundwater to remove contaminants from the aquifer. The time to achieve these risk reductions would be limited by the effective extraction rates from the aquifer. The long-term effectiveness of any of the systems would be dependent upon a well planned monitoring program and proper operation and maintenance of the treatment system. None of the alternatives would be able to remediate the groundwater to federal and state standards in a reasonable period, but the treatment alternatives would protect downgradient groundwater from further contamination while further investigation of the downgradient groundwater is conducted. The reinjection process called for in Alternatives GW-3, GW-4, and GW-5 would result in conservation of groundwater resources. Alternative GW-7 extracts groundwater from the aquifer and discharges it to a POTW, thereby failing to replenish the aquifer.

Alternative GW-4 would require the disposal of more process residuals than Alternatives GW-3, GW-5, and GW-7, since liquid phase carbon adsorption would be used. The estimated annual carbon usage would be approximately 6,000 lbs for the liquid phase activated carbon unit called for in Alternative GW-4 as opposed to an estimated 2,000 lbs for the vapor phase carbon unit called for in Alternative GW-3.

▲ Reduction in Toxicity, Mobility, or Volume

Alternatives GW-1 and GW-2 would not involve any removal, treatment, or disposal of the contaminants in the aquifer and therefore would not be effective in reducing the toxicity, mobility, or volume.

Alternatives GW-3, GW-4, GW-5, and GW-7 would effectively reduce the toxicity, mobility, and volume of contaminants in the aquifer to a larger extent than Alternatives GW-1 and GW-2, since removal, treatment and disposal would be provided. These four alternatives would be similarly effective in their reduction of the toxicity, mobility, and volume of contaminants.

▲ Short-term Effectiveness

The implementation of Alternatives GW-1 and GW-2 would result in no additional risk to the community or on-site workers during remedial activities since no major construction activities would be conducted.

Alternatives GW-3, GW-4, GW-5, and GW-7 include excavation activities, installation of the collection and reinjection/discharge systems, and construction of the treatment plant that could result in potential exposure of residents and workers to volatilized contaminants and contaminated dust. The treatment plant would be constructed on-site. Proper handling procedures of the treatment reagents must be followed for all treatment alternatives. All alternatives, except Alternatives GW-1 and GW-2, would generate process residuals requiring proper handling and disposal.

Alternatives GW-1 and GW-2 would take less than 1 year to implement. Alternatives GW-3, GW-4, GW-5, and GW-7 would all require approximately 2 years to complete their construction prior to operation.

▲ Implementability

All components of Alternatives GW-1 and GW-2 would be easily implemented. Alternative GW-2 would require that state or local authorities implement institutional controls to restrict the use of the aquifer for private and municipal purposes. These controls would have to be implemented by the state or local authorities. Alternatives GW-3, GW-4, GW-5, and GW-7 would utilize relatively common construction equipment and materials. Site space available for treatment plant construction is limited. In light of this, Alternative GW-7 would be the easiest treatment alternative to implement since only a pretreatment system would be required on-site. However, Alternative GW-7 would require that a discharge permit be granted by local authorities. There is a degree of uncertainty as to whether this permit could be obtained.

The metals precipitation technology common to all treatment alternatives is proven and reliable in achieving the specified process efficiency and performance goals. The air stripper and vapor phase carbon unit called for in Alternative GW-3 is a proven and efficient method of removing organic contaminants from groundwater, as is the liquid phase carbon adsorption technology proposed for use in Alternative GW-4. UV-chemical oxidation (for destruction of organic contaminants) called for in Alternative GW-5 has not been used extensively, but has been used successfully in several groundwater treatment facilities. An additional process may need to be added onto Alternative GW-5 if the resulting chlorides from the UV-chemical oxidation process exceed the maximum limits allowable for reinjection. The use of the activated sludge process of the Bay Park Sewage Treatment Plant proposed for use in Alternative GW-7, to remove the organic contaminants from the pretreated groundwater, is a conventional municipal wastewater treatment system designed to aerobically biodegrade organic contaminants.

All proposed treatment technologies are readily available from a number of sources with the exception of UV-chemical oxidation. It is expected that additional equipment manufactures will be available once the UV-chemical technology becomes more mature.

Alternatives GW-3, GW-4, and GW-5 would require institutional management of the operation and maintenance of the treated groundwater reinjection system. Alternative GW-7 would require coordination with the Bay Park Sewage Treatment Plant for the discharge and treatment of the pretreated groundwater.

Off-site disposal facilities are available for the disposal of the pretreatment sludge generated from Alternatives GW-3, GW-4, GW-5 and GW-7. Disposal facilities for the spent carbon generated from Alternatives GW-3 and GW-4 are also available. The estimated annual carbon usage would be approximately 6,000 lbs for the liquid phase activated carbon unit called for in Alternative GW-4 as opposed to an estimated 2,000 lbs for the vapor phase carbon unit called for in Alternative GW-3. The spent carbon would be transported off-site for disposal or regeneration and reuse. Any process residual generated from the activated sludge system during the treatment of the contaminated groundwater in Alternative GW-7 would be properly handled by the Bay Park Sewage Treatment facility.

Cost

According to the present worth cost estimates for all alternatives evaluated, Alternative GW-5 ($5,224,800) would be the most costly alternative to implement followed by Alternatives GW-4, GW-3, GW-7, GW-2, and GW-1. Alternative GW-7 would be the least expensive treatment alternative. Present worth is based on a 5% discount rate, and a 30-year operational period. The present worth cost estimates for the alternatives evaluated are as follows:

GW-1:	$ 534,600
GW-2:	611,400
GW-3:	3,909,600
GW-4:	4,162,000
GW-5:	5,224,800
GW-7:	3,537,900

Community Acceptance

No objections from the community were raised regarding the selected groundwater remedy. A responsiveness summary which addresses all comments received during the public comment period, including the March 13, 1991 public meeting, is attached as Appendix IV.

▲ <u>State Acceptance</u>

The State of New York, through the NYSDEC, has concurred with EPA's selected remedy. The NYSDEC letter of concurrence is attached as Appendix III.

SELECTED REMEDY

Based upon an evaluation of the various alternatives, EPA and NYSDEC recommend **Alternative SC-5 (In-Situ Vacuum Extraction/ Surface Excavation/Excavation of Leaching Pits/Off-Site Treatment and Disposal/Backfill with Clean Off-Site Soil)** and active restoration of the groundwater utilizing **Alternative GW-3 (Pumping/ Metals Precipitation/Air Stripping/Reinjection)** as the preferred alternative for remediation of contaminated soils and groundwater at the Facility. Prior to implementation, an extensive design effort will be performed to elaborate on specific details of the preferred alternative.

The preferred alternative will involve the following actions:

Soil

First, an in-situ vacuum extraction process will be employed over portions of the contaminated area (2,500 ft^2) to reduce the volatile organic contaminants, mainly trichloroethene, to 1 mg/kg or one part per million. This process will involve the installation of approximately 5 vacuum extraction wells, each with a maximum depth of 30 feet. The vacuum wells will be connected via a piping system to a skid-mounted, high volume vacuum pump. The vacuum pump will pull air through the contaminated soils, within a radius of 20 feet from the wells, depending on soil composition and volatility of the contaminants. The air containing the stripped volatile organics will be fed through a condenser to remove moisture and then through an emissions control system, i.e., a vapor phase carbon adsorption system to remove volatilized organics.

After the vacuum extraction process, the top 4 - 5 feet of soils at the Facility will be excavated, resulting in approximately 1,600 cubic yards of material to be transported for off-site treatment and disposal in compliance with land disposal restrictions. Excavation to this depth addresses all contamination found with the exception of the deeper contamination in the leaching pit areas. This will eliminate the risk posed by direct contact with soils. During the course of this initial excavation when the leaching pits or "hot spots" of contamination can be further delineated, the excavation will continue until all contaminated soils are removed. It is estimated that the leaching pit excavation will result in 480 cubic yards of material transported off-site for treatment and disposal. This amount is based upon the leaching pits being between 12 - 18 feet in depth and 12 feet wide and assumes that soils within 2 feet of these parameters would also need to be excavated. Exact areas and depths of contamination will be determined during the design phase. Additional sampling during design to delineate "hot spots" will ensure that all contaminated areas are removed and, at the same time, that excessive and unnecessary excavation will not occur as with Alternative SC-4. The excavated areas will be backfilled with clean soil and the entire open area (16,000 ft^2) will then be graded.

Alternative SC-5 will treat the principal threat posed by Site soils and significantly reduce cross-media impacts on the underlying groundwater.

During the design phase, further evaluation of the potential for inorganic contaminants to leach from the soil to the groundwater will be conducted to determine the specific soil quantities required to be removed in order to protect the groundwater from significant inorganic contamination resulting from leaching of the inorganic contamination in the soils. The cleanup levels derived from this effort will represent average contaminant concentrations of the inorganic chemicals in the soil which will theoretically produce contaminant groundwater concentrations in the Site vicinity which will meet potable water standards. Also, the design phase will involve sampling of areas adjacent to the Site to determine immediate background levels and to ensure that soils off-site do not pose a risk.

The present worth of Alternative SC-5 is $1,777,410.

Groundwater

Approximately 28,800 gallons per day of contaminated groundwater will be extracted through one extraction well to be installed at the southwestern corner of the Site into the Upper Glacial Aquifer to a depth of approximately 70 feet, in order to remove heavy metals and chlorinated organics which are currently present above state and/or federal drinking water standards. The treated groundwater will then be reinjected into the aquifer through two reinjection wells. The siting of the extraction and reinjection wells will be completed during the design phase based on technical criteria. The treatment residuals will be disposed of in a RCRA subtitle C facility. The major components of the groundwater remedy, Alternative GW-3, are depicted in Figure 4. All contaminant concentrations will be reduced until they are equal to or less than their respective federal or state standards prior to reinjection. The treated effluent will be tested to ensure that the treatment system is operating efficiently. Any waste residuals generated by the treatment processes will be disposed of in accordance with applicable disposal standards.

The purpose of the interim groundwater response action is to control risks posed by the ingestion of contaminated groundwater and to limit further migration of contaminants by addressing the following issues:

- Containment of the most highly contaminated portion of the contaminant plume;

- The metal concentrations (chromium, nickel, copper, cadmium, manganese, and iron) will be reduced through a metals precipitation process involving a clarification/filtration unit.

- The chlorinated organic concentrations (1,1,1-trichloroethane, trichloroethene, 1,1-dichloroethene, and tetrachloroethene) will be reduced using air stripping.

- Collection of data on aquifer and contaminant response to remediation measures.

The ultimate goal of groundwater remediation will be determined in a final remedial action for this Site. This interim groundwater remedial action will be monitored carefully to determine the feasibility of achieving this goal with this method and to ensure that hydraulic control of the contaminated plume is maintained. After the period of time necessary, in EPA's judgement, to arrive at a final decision for the Site, a final ROD for groundwater, which specifies the ultimate goal, remedy and anticipated remediation timeframe, will be prepared. Upon completion of the second operable unit RI/FS, this interim system may be incorporated into the design of the Site remedy specified in the final action groundwater ROD.

The present worth of Alternative GW-3 is $3,909,600.

STATUTORY DETERMINATIONS

EPA believes that the selected interim remedy will satisfy the statutory requirements of providing protection of human health and the environment, being cost-effective, utilizing permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable, and satisfying the preference for treatment as a principal element.

Protection of Human Health and the Environment

Alternative SC-5 is considered to be fully responsive to this criterion and to the identified remedial response objectives. Treatment, excavation, and disposal of the contaminated Site soils will prevent the release of contaminants to the environment and will constitute excellent protection of both human health and the environment. The carcinogenic and non-carcinogenic risks associated with the contaminated soil will be reduced to acceptable levels for current and future uses (i.e. 10^{-4} to 10^{-6} and HI < 1.0). Treatment of the groundwater through implementation of Alternative GW-3 will reduce the toxicity, mobility, or volume of contaminants in the groundwater and result in overall protection of human health and the environment. Prior to reinjection, the groundwater will meet all state and/or federal drinking water standards. A second operable unit will be initiated to address potential future risks.

Compliance with ARARs

The selected remedy for source control (SC-5: in-situ vacuum extraction/surface excavation/excavation of leaching pits/off-site treatment and disposal/backfill with clean off-site soil) will comply with all related ARARs. The off-site facility will be fully RCRA permitted and will be in compliance with the terms of the permit. Contaminated soil, debris, and sediments from the Site will be treated using specific technologies or specific treatment levels, as appropriate, to comply with LDRs. The residuals from the treatment processes (i.e., spent carbon) will be treated and disposed of to comply with LDRs. This alternative will comply with LDRs through a treatability variance for the contaminated soil, debris, sediments, and residuals. Based on concentrations determined by the Toxicity Characteristic Leaching Procedure (TCLP) test, the appropriate concentration range or percent reduction will be determined during design.

At the completion of the response action for contaminated soil, the selected remedy will have complied with the following ARARs:

Action-specific ARARs:

The selected remedy calls for the transport of contaminated soil and treatment residuals to a RCRA facility for treatment and disposal and will comply with the following ARARs:

- RCRA 40 CFR Part 263 - Standards Applicable to Transport of Hazardous Waste
- RCRA 40 CFR Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- RCRA 40 CFR Part 268 - Spent carbon from the in-situ vacuum extraction treatment system as well as any other treatment residuals will be disposed of off-site, consistent with applicable land disposal restrictions.
- 6 NYCRR Part 372 - Hazardous Waste Manifest System & Related Standards for Generators, Transporters and Facilities.
- 6 NYCRR Subpart 373-2 Final State Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities.

▲ During implementation of the in-situ vacuum extraction, all resulting air emissions will be in compliance with 6 NYCRR Parts 200, 201, 212, and 231.

Chemical-specific ARARs:

▲ None applicable.

Location-specific ARARs:

▲ None applicable.

The selected groundwater remedy, GW-3: pumping/metals precipitation/air stripping/reinjection, is expected to comply with the associated ARARs over time. The primary purpose for this interim groundwater remediation is to contain and treat the most highly contaminated portion of the plume. A second operable unit, resulting in the final groundwater remedial action for the Site, will address achievement of chemical-specific ARARs in groundwater.

The residuals from the treatment processes (i.e., spent carbon) will be treated and disposed of to comply with LDRs. This alternative will comply with LDRs through a treatability variance for the spent carbon.

The associated ARARs include:

Action-specific ARARs:

▲ RCRA 40 CFR Parts 141.11-141.16 (SDWA Maximum Contaminant Levels (MCLs)) (See Table 1 in Appendix II), provide standards and goals for toxic compounds for public drinking water systems. The reinjection process for the treated groundwater will meet underground reinjection well regulations by its status as a Superfund remedial action under 40 CFR 147. The extracted groundwater will be treated to meet all standards prior to reinjection.

▲ 6 NYCRR Part 703 and 10 NYCRR Part 5 - provide groundwater quality standards and drinking water standards.

▲ RCRA 40 CFR Parts 263, 264, 268; and NYCRR Part 372 (described above under action-specific ARARs for soil) - spent carbon, as well as any treatment residuals, from the groundwater treatment system for removal of organics and inorganics will be transported, treated (as necessary), and disposed of off-site.

Chemical-specific ARARs:

- Since the groundwater at the Site is classified as IIb, drinking water standards are relevant and appropriate. Again, these include SDWA MCLs, 6 NYCRR Groundwater Quality Regulations and/or limitations of discharges to Class GA waters, and 10 NYCRR Part 5 standards.

Location-specific ARARs:

- None applicable.

Cost Effectiveness

The selected remedy provides overall effectiveness proportional to its cost. The total capital and present worth costs for the soil and groundwater alternatives are estimated to be $1,777,410 and $3,909,200, respectively. The selected soil alternative, SC-5, is the least expensive treatment alternative. The selected groundwater alternative, GW-3, is the second least expensive treatment alternative. Alternative GW-7, involving discharge to the POTW, would be slightly less costly to implement, however, GW-7 would not conserve groundwater resources.

Detailed cost estimates of the selected groundwater and soil alternatives are depicted on Tables 6 and 7, respectively.

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

The selected remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable. The selected remedy represents the best balance of trade-offs among the alternatives with respect to the evaluation criteria. The State and community also support the selected remedy.

The selected remedy employs permanent treatment of the organic contaminated soil on the Site through the implementation of in-situ vacuum extraction and through excavation and off-site treatment and disposal. The potential for future releases of organic contaminants to the environment as well as the direct contact risk to the soils will be eliminated. The indirect and direct risks posed by the soils as a continued source of groundwater contamination will be removed. Extraction and treatment of contaminated groundwater will reduce the toxicity, mobility, and volume of contaminants in the groundwater underlying the Site and prevent further degradation of area groundwater.

No short-term adverse impacts and threats to human health and the environment are foreseen as the result of implementing the selected remedy. However, to minimize and/or prevent worker exposure to contaminants, personal protection equipment will be utilized.

The selected remedy will require construction of on-site soil and groundwater treatment facilities. No technological problems are anticipated since the treatment technologies are well established and readily available.

Preference for Treatment as the Principal Element

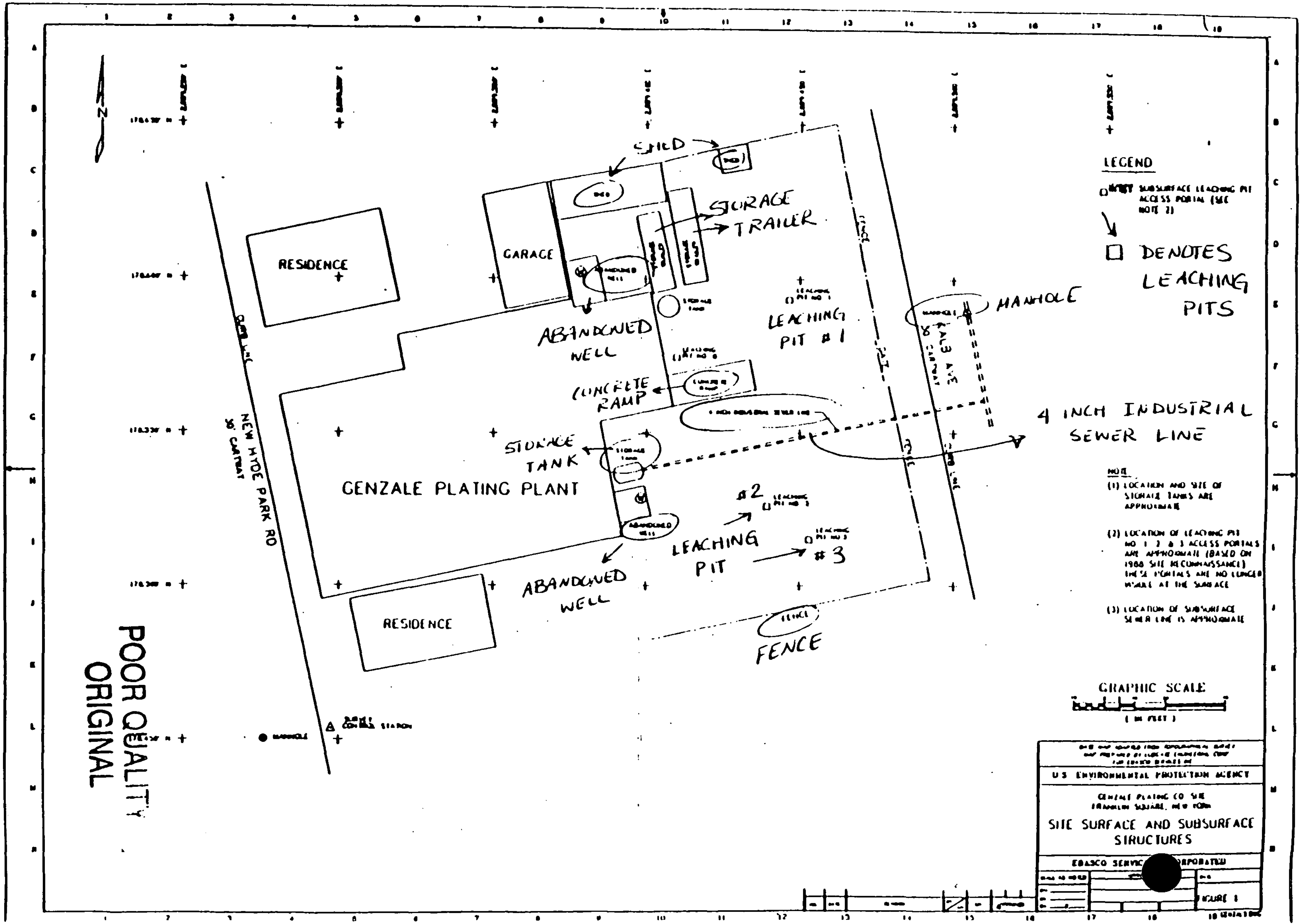
The selected remedy fully satisfies this criterion for the treatment of the soil and groundwater contamination which are considered the principal threats at the Site. There the statutory preference for remedies that employ treatment as a principal element is satisfied.

EXPLANATION OF SIGNIFICANT DIFFERENCES

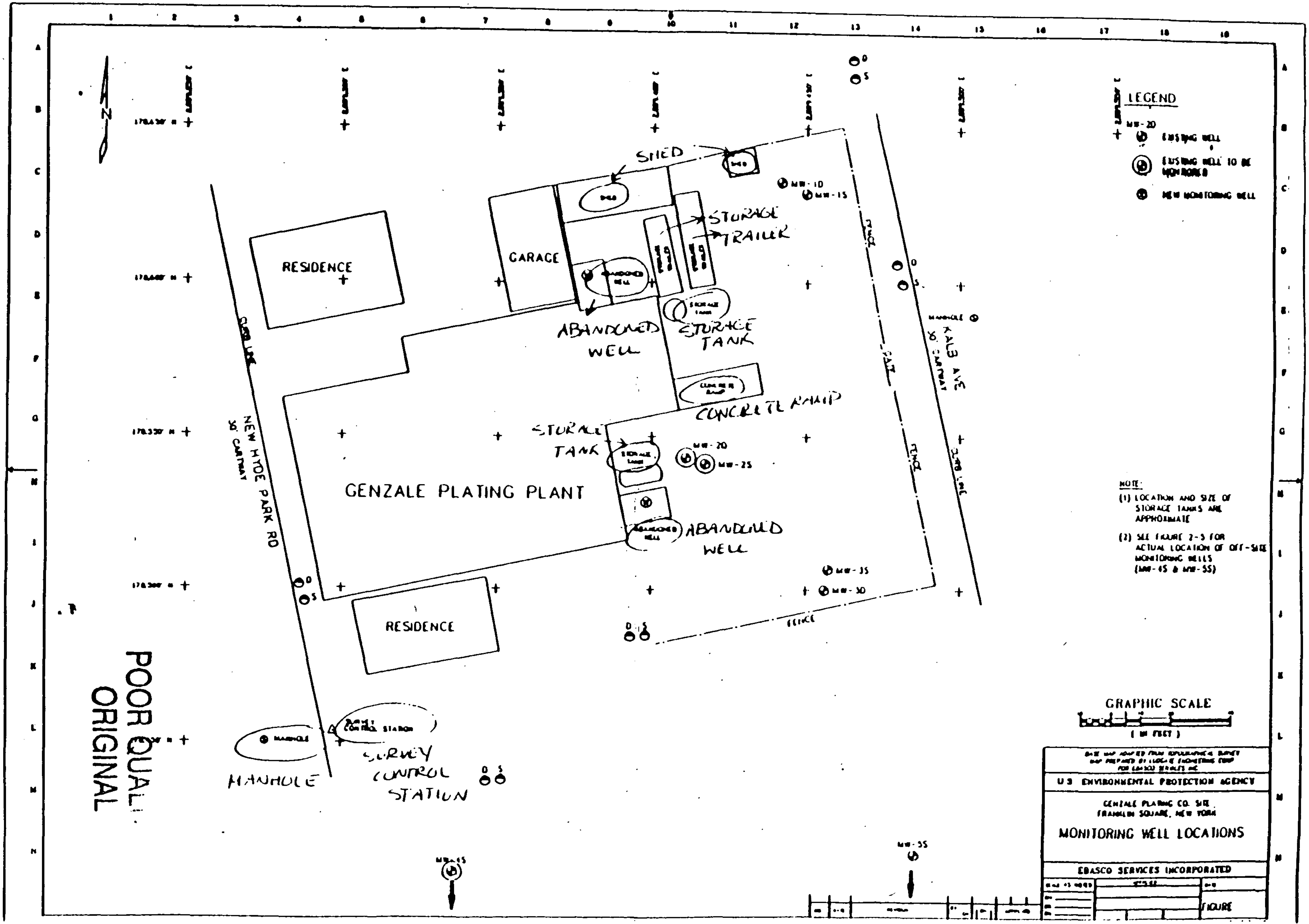
The Proposed Plan for the Genzale Plating Company site was released to the public on February 22, 1991. The Proposed Plan identifies the selected remedy as including Alternatives SC-5 and Alternative GW-3. Upon further review, EPA determined that a minor modification to the selected soil remedy (SC-5), as it was originally identified in the Proposed Plan, was necessary. Because the principal threat posed by the contaminated soil at the Site will be eliminated through removal or treatment of the soils, EPA determined that an asphalt cap over the entire Facility is not required. In the alternative, EPA proposed that the entire Facility be backfilled with clean off-site soil, and this proposed difference was presented and explained at the public meeting to provide the public with an opportunity to comment on the change. EPA has reviewed all verbal comments expressed during the public meeting, and no written comments were received. No objections to the proposed plan or the modification were raised.

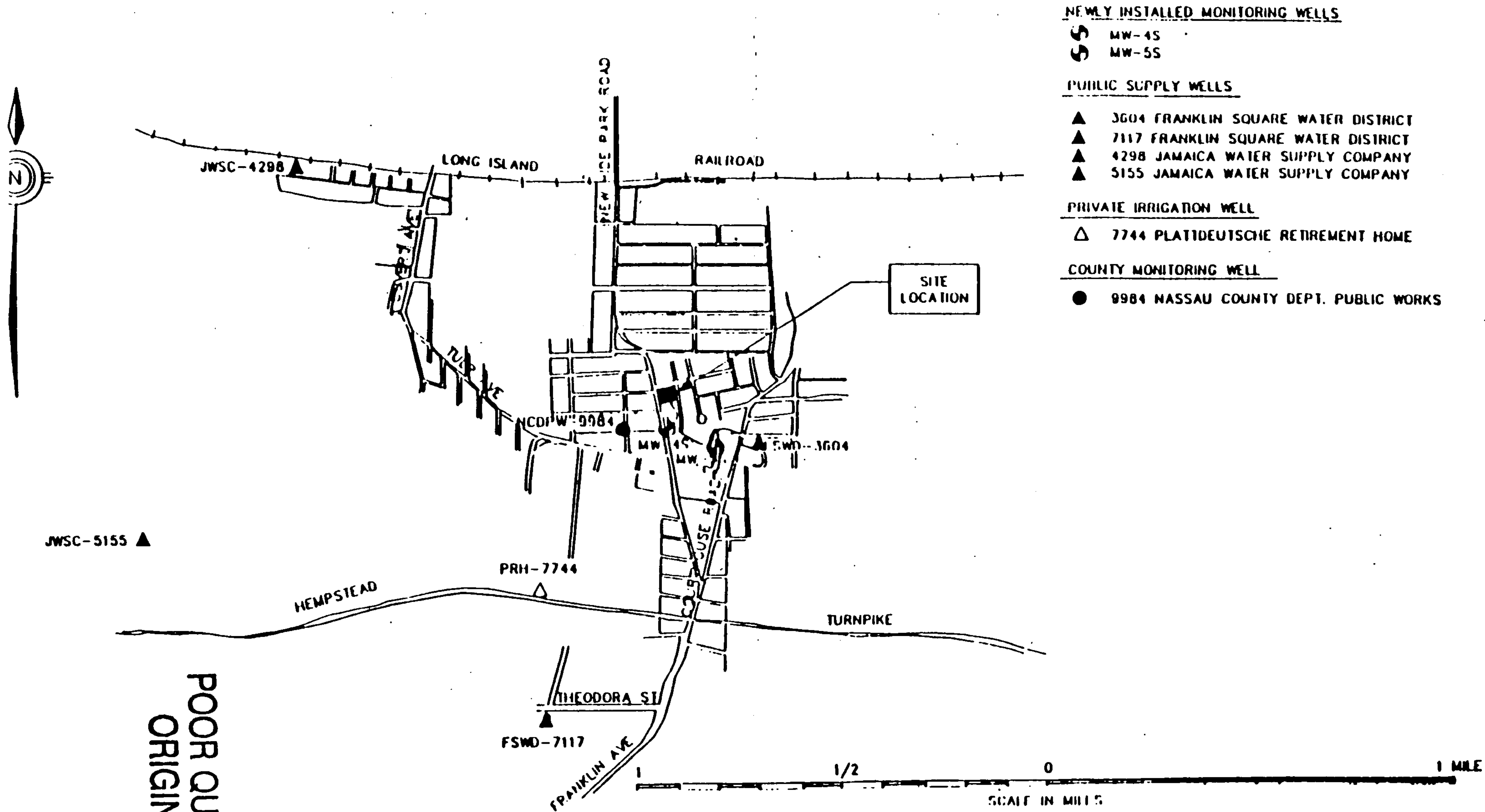
APPENDIX I

FIGURES



SHED
STORAGE TRAILER
GARAGE
RESIDENCE
ABANDONED WELL
LEACHING PIT #1
MANHOLE
CONCRETE RAMP
4 INCH INDUSTRIAL SEWER LINE
STORAGE TANK
GENZALE PLATING PLANT
NEW HYDE PARK RD
#2
LEACHING PIT
#3
ABANDONED WELL
RESIDENCE
FENCE
LEGEND
DENOTES LEACHING PITS
GRAPHIC SCALE
U S ENVIRONMENTAL PROTECTION AGENCY
SITE SURFACE AND SUBSURFACE STRUCTURES
EBASCO SERVICES
FIGURE 1
POOR QUALITY ORIGINAL


LEGEND
MW-20
EXISTING WELL
EXISTING WELL TO BE MONITORED
NEW MONITORING WELL
SHED
STORAGE TRAILER
GARAGE
RESIDENCE
ABANDONED WELL
STORAGE TANK
CONCRETE RAMP
GENZALE PLATING PLANT
NEW HYDE PARK RD
KALB AVE
FENCE
MW-1D
MW-1S
MW-2D
MW-2S
MW-3S
MW-3D
MW-4S
MW-5S
MANHOLE
SURVEY CONTROL STATION
NOTE:
(1) LOCATION AND SIZE OF STORAGE TANKS ARE APPROXIMATE
(2) SEE FIGURE 2-5 FOR ACTUAL LOCATION OF OFF-SITE MONITORING WELLS (MW-4S & MW-5S)
GRAPHIC SCALE
(IN FEET)
U.S. ENVIRONMENTAL PROTECTION AGENCY
GENZALE PLATING CO. SITE
FRANKLIN SQUARE, NEW YORK
MONITORING WELL LOCATIONS
EBASCO SERVICES INCORPORATED
FIGURE
POOR QUALITY ORIGINAL



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EBASCO SERVICES INCORPORATED

DEPT 940 DR DSW
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SCALE AS NOTED
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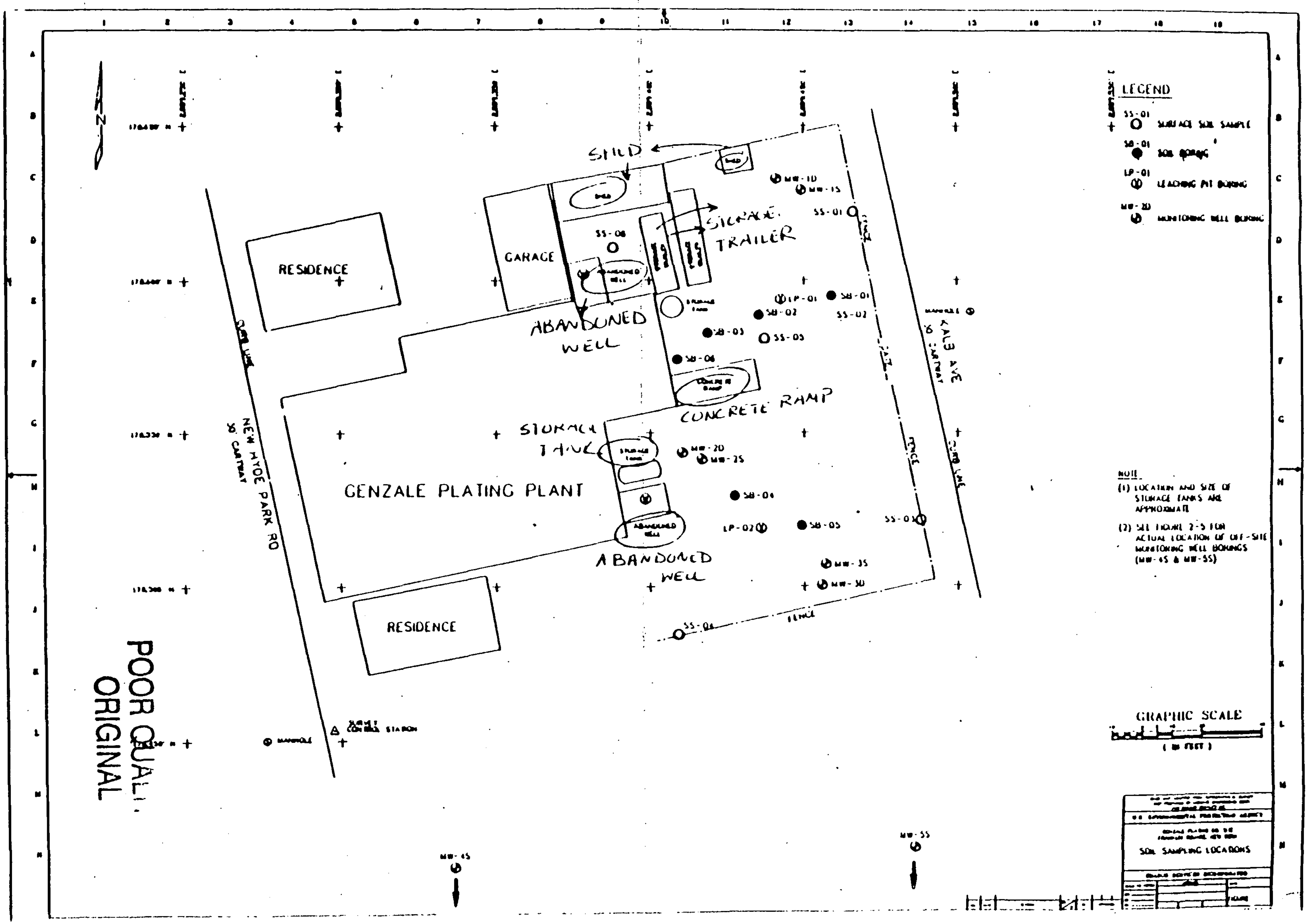
U.S. ENVIRONMENTAL PROTECTION AGENCY

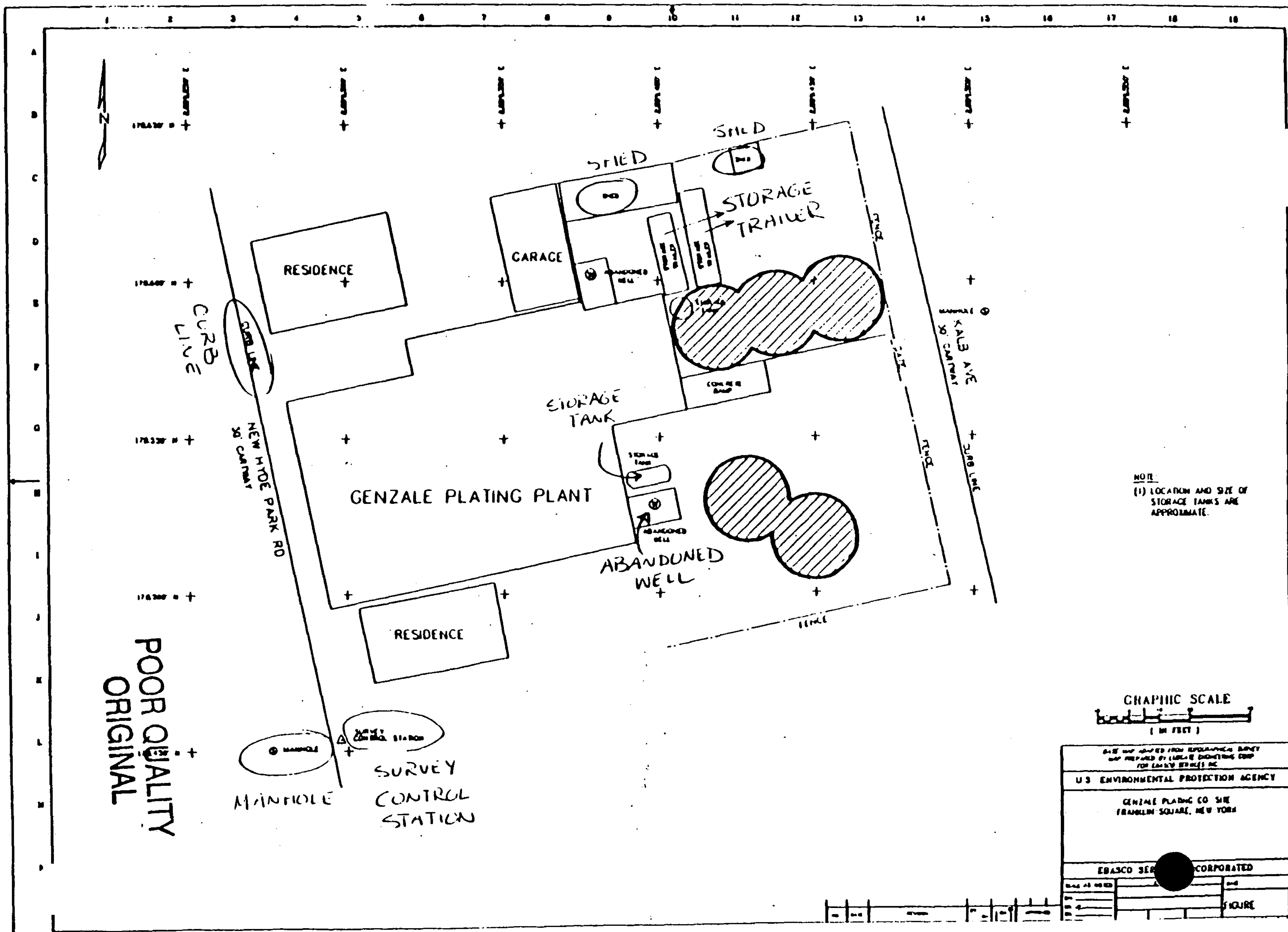
GENZALE PLATING CO. SITE

OFF-SITE WELLS INCORPORATED IN GROUNDWATER SAMPLING PROGRAM

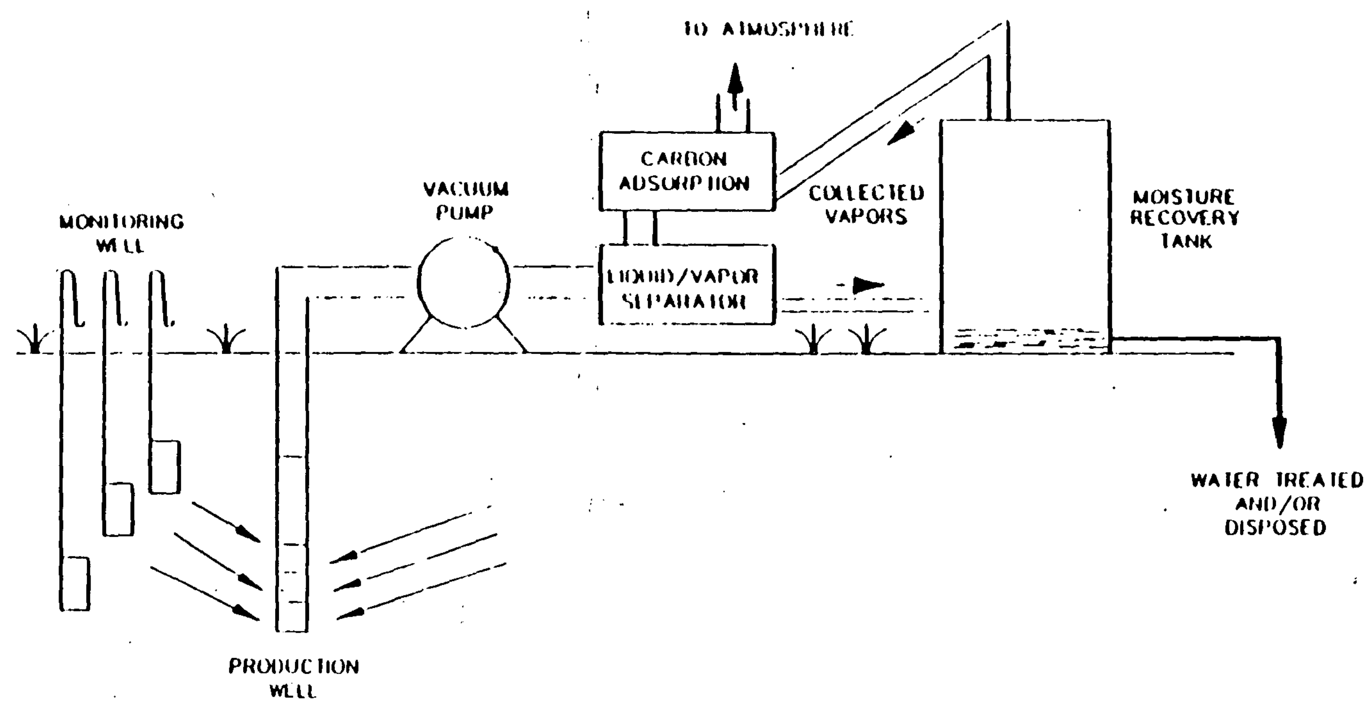
EPA 4238.374

FIGURE 2-8 00


LEGEND
SS-01 SURFACE SOIL SAMPLE
SB-01 SOIL BORING
LP-01 LEACHING PIT BORING
MW-2D MONITORING WELL BORING
RESIDENCE
GARAGE
SHED
STORAGE TRAILER
SS-06
ABANDONED WELL
MW-1D
MW-1S
SS-01
LP-01
SB-01
SB-02
SS-02
SB-03
SS-05
SB-06
CONCRETE RAMP
STORAGE TANK
MW-2D
MW-2S
GENZALE PLATING PLANT
SB-04
LP-02
SB-05
SS-03
MW-3S
MW-3D
SS-04
FENCE
NEW HYDE PARK RD
KALB AVE
RESIDENCE
MW-4S
MW-5S
NOTE
(1) LOCATION AND SIZE OF STORAGE TANKS ARE APPROXIMATE
(2) SEE FIGURE 2-5 FOR ACTUAL LOCATION OF OFF-SITE MONITORING WELL BORINGS (MW-4S & MW-5S)
GRAPHIC SCALE
(IN FEET)
SOIL SAMPLING LOCATIONS
POOR QUALITY ORIGINAL



SHED
SHED
STORAGE TRAILER
RESIDENCE
GARAGE
ABANDONED WELL
CURB LINE
FENCE
KALB AVE
30' CARTWAY
STORAGE TANK
GENZALE PLATING PLANT
NEW HYDE PARK RD
30' CARTWAY
ABANDONED WELL
CURB LINE
RESIDENCE
FENCE
NOTE:
(1) LOCATION AND SIZE OF STORAGE TANKS ARE APPROXIMATE.
GRAPHIC SCALE
(IN FEET)
U.S. ENVIRONMENTAL PROTECTION AGENCY
GENZALE PLATING CO. SITE
FRANKLIN SQUARE, NEW YORK
EBASCO SER
CORPORATED
FIGURE
MANHOLE
SURVEY CONTROL STATION
POOR QUALITY ORIGINAL



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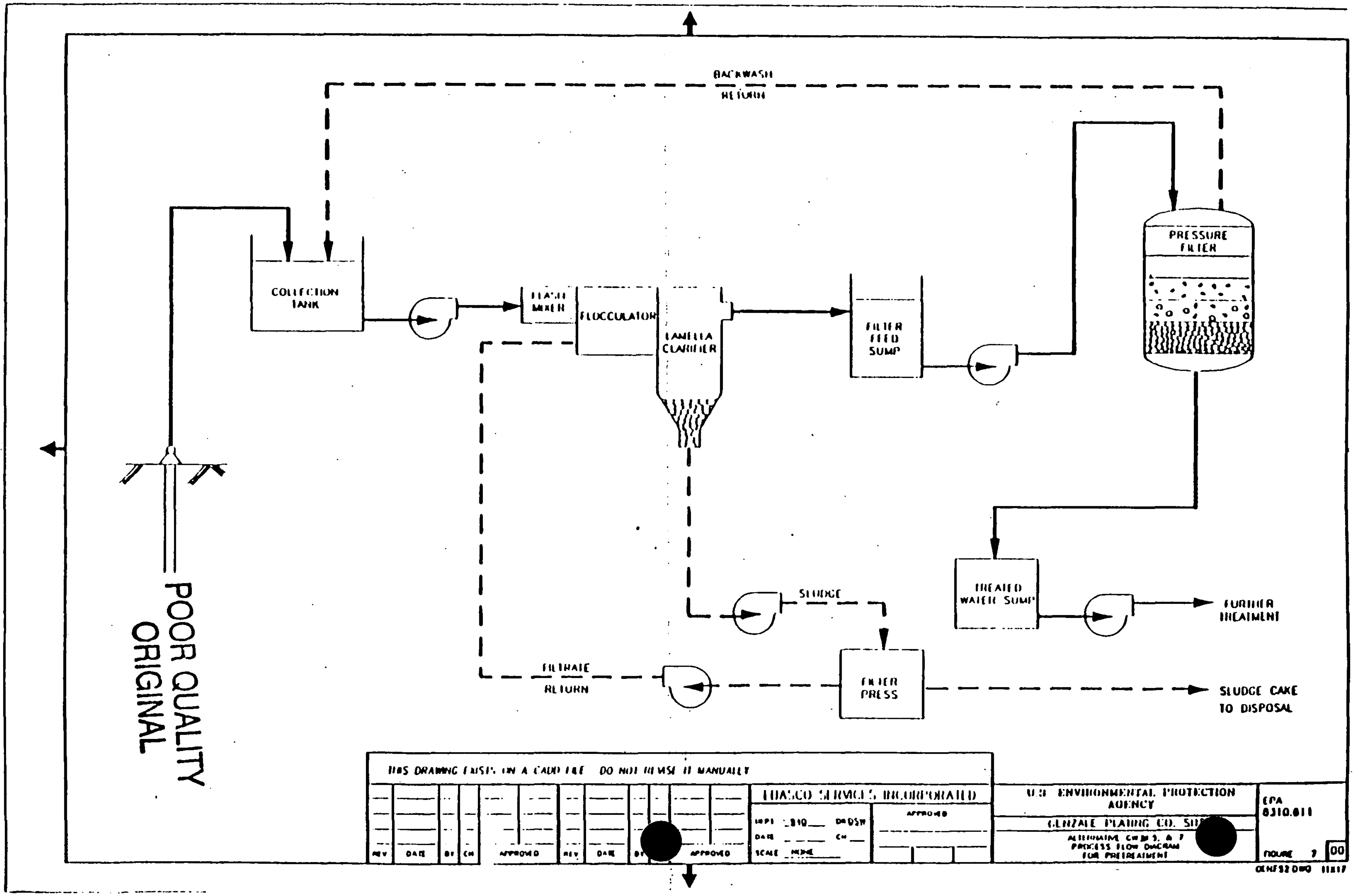
EBASCO SERVICES INCORPORATED

U.S. ENVIRONMENTAL PROTECTION AGENCY

EPA 8310.811

FIGURE


BACKWASH
RETURN
COLLECTION TANK
FLASH MIXER
FLOCCULATOR
LAMELLA CLARIFIER
FILTER FEED SUMP
PRESSURE FILTER
SLUDGE
TREATED WATER SUMP
FURTHER TREATMENT
FILTRATE
RETURN
FILTER PRESS
SLUDGE CAKE TO DISPOSAL
THIS DRAWING EXISTS ON A CADD FILE DO NOT REVISE IT MANUALLY
EBASCO SERVICES INCORPORATED
U.S. ENVIRONMENTAL PROTECTION AGENCY
GENZALE PLATING CO. SITE
ALTERNATIVE GW-3, 5, & 7
PROCESS FLOW DIAGRAM
FOR PRETREATMENT
EPA
8310.611
FIGURE 7
00
SCALE NONE
REV
DATE
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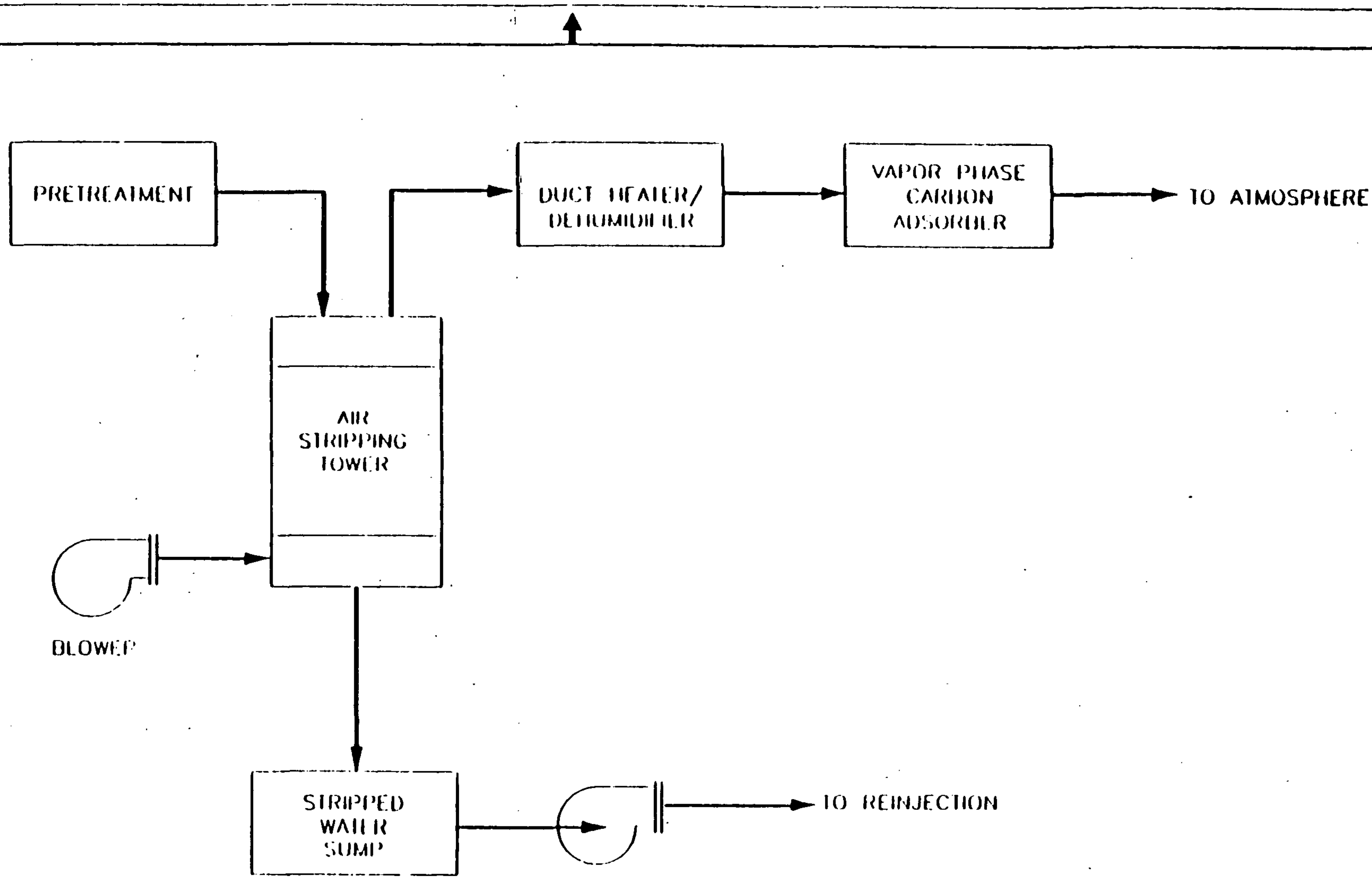
APPROVED



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EBASCO SERVICES INCORPORATED

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U.S. ENVIRONMENTAL PROTECTION AGENCY

GENZALE PLATING CO. SITE

ALTERNATIVE GW 3
PROCESS FLOW DIAGRAM FOR AIR STRIPPING

EPA 8310.811

FIGURE 8

APPENDIX II

TABLES

TABLE 1

CONTAMINANTS OF CONCERN IN GROUNDWATER AND THEIR COMPARISON WITH ARAR BASED CLEANUP LEVELS

Contaminant	Average* Concentration (ug/l)	Maximum Concentration (ug/l)	Minimum Concentration (ug/l)	SWDA MCL's (ug/l)	NY MCL's (ug/l)	NYS GROUNDWATER STANDARDS CLASS GA (ug/l)	NYS TECHNICAL OPERATIONAL G SERIES (TOGS) (ug/l)
VOLATILE ORGANICS							
1,1-Dichloroethane	1.43	3	ND	-	5	-	50
1,1-Dichloroethene	25.13	94	ND	7	5	-	0.07
Tetrachloroethene	41.5	96	ND	5	5	-	0.07
1,1,1-Trichloroethane	299	1100	ND	200	5	-	50
1,1,2-Trichloroethane	1.45	2	ND	-	5	-	0.6
Trichloroethene	123.90	500	ND	5	5	10	-
Vinyl Chloride	0.40	0.6	ND	2	2	5.0	-
Semivolatile Organics							
Benzo(a)anthracene	1.75	2	ND	-	50	-	-
Benzo(b)fluoranthene	1.75	2	ND	-	50	-	0.002
Benzo(a)pyrene	2.0	2	ND	-	10	-	-
Bis(2-ethylhexyl)Phthalate	9.5	36	ND	-	50	-	-
Chrysene	1.75	2	ND	-	50	-	0.002
Inorganics							
Antimony	421.43	1116	ND	-	-	-	30
Arsenic	5.68	11.3	ND	50	50	25	-
Barium	260.13	314	51	-	1000	1000	1000
Beryllium	2.43	2.9	ND	-	-	-	-
Cadmium	23	37	ND	10	10	10	3
Chromium VI	3523.06	14400	73.7	-	50	50	-
Copper	832.78	3220	16	-	1000	1000	-
Iron	54042.5	120,000	1560	-	300**	300	-
Lead	96.27	185	17.6	50	50	25	-
Manganese	853	18900	18	-	300**	300	-
Nickel	4726.03	21900	44	-	-	-	-
Vanadium	98.97	731	ND	-	-	-	-
Zinc	419.1	1820	22	-	5***	5000	5000

* Average of on-site wells. Duplicate samples are averaged to represent a well.
** If iron and manganese are present, the total concentration of both should not exceed 0.5 mg/l. Higher levels may be allowed when justified by t supplier of water.
*** Secondary Standard

TABLE 2

CONTAMINANTS OF CONCERN DETECTED IN SOIL AND THEIR COMPARISON WITH ACTION LEVELS

Contaminant	Average Concentration mg/kg	Maximum Concentration mg/kg	Minimum Concentration mg/kg
Volatile Organics			
Trichloroethene	2.78	53	ND
Semivolatile Organics			
Benzo(a)anthracene	0.405	2.2	ND
Benzo(a)pyrene	0.440	1.8	ND
Benzo(b)fluoranthene	0.590	3.0	ND
Bis(2-ethylhexyl)phthalate	4.569	24.0	ND
Chrysene	0.463	2.2	ND
Indeno(1,2,3-c,d)pyrene	0.339	1.0	ND
Inorganics			
Arsenic	2.72	14.8	ND
Barium	604.65	36400	ND
Chromium (VI)	1466.63	37300	2.1
Nickel	1981.16	58000	ND
Pesticides/PCBs			
PCBs (Arochlor 1260)	0.462	1.213	ND

* - Based on excess lifetime cancer risk of 1×10^{-6}
ND - Not detected or below method of detection limit
NR - No risk identified
BG - Action level based on background concentration

3376K

INORGANIC COMPOUND CONCENTRATIONS TYPICALLY FOUND IN LONG ISLAND SOIL

ANALYTES	BACKGROUND[1] CONCENTRATION RANGE (mg/kg)
Aluminum	10000 - 300000
Antimony	<1 - 500[2]
Arsenic	5 - 15[2]
Barium	100 - 3500
Beryllium	<1 - 7[2]
Cadmium	0.01 - 7
Calcium	100 - 400000
Chromium	10 - 80[2]
Cobalt	<3 - 70[2]
Copper	2 - 100
Iron	7000 - 550000
Lead	3 - 30[2]
Magnesium	100 - 4000
Mercury	0.2 - 0.6[2]
Nickel	4 - 30[2]
Potassium	400 - 30000
Selenium	0.1 - 2.0
Silver	0.1 - 5.0
Sodium	750 - 7500
Thallium	1 - 2[3]
Vanadium	20 - 500
Zinc	10 - 300
Cyanide	Not Available

SOURCE: (1) Dragun, J., 1988

(2) Conner, J.J. and H.T. Shacklette, 1975

(3) USEPA, 1982

TABLE 4 - TOXICITY PARAMETERS USED IN THE RISK ASSESSMENT (Sheet 1 of 2)

Chemical of Potential Concern	Chronic Reference Dose (RfD) (mg/kg/day)				Subchronic Reference Dose (RfDs) (mg/kg/day)				Cancer Potency Factor (mg/kg/day)^-1				
	Inhalation	Source (a)	Oral	Source (a)	Inhalation	Source (a)	Oral	Source (a)	Inhalation	Source (a)	Oral	Source (a)	Wt. of Ev.
acetone	NA (c)		1.00E-01	IRIS	ND		NA		NA		NA		D
benzene	NA (b)		NA		NA		NA		2.90E-02	IRIS	2.90E-02	IRIS	A
bromodichloromethane	NA		2.00E-02	IRIS	NA		2.00E-02	HEA	NA		NA		B2
2-butanone (MEK)	9.00E-02	HEA	5.00E-02	IRIS	9.00E-01	HEA	5.00E-01	HEA	NA		NA		D
carbon tetrachloride	NA		7.00E-04	IRIS	NA		7.00E-03	HEA	1.30E-01	IRIS	1.30E-01	IRIS	B2
chlorobenzene	5.00E-03	HEA	2.00E-02	IRIS	5.00E-02	HEA	2.00E-01	HEA	NA		NA		D
chloroform	ND		1.00E-02	IRIS	NA		1.00E-02	HEA	8.10E-02	IRIS	6.10E-03	IRIS	B2
chloromethane	NA		NA		NA		NA		6.30E-03	HEA	1.30E-02	HEA	C
dibromochloromethane	NA		2.00E-02	IRIS	NA		2.00E-01	HEA	NA		8.40E-02	HEA	C
1,1-dichloroethane	1.00E-01	HEA	1.00E-01	HEA	5.00E+00	HEA	1.00E+00	HEA	ND		9.10E-02	HEA	C
1,2-dichloroethane	NA		NA		NA		NA		9.10E-02	IRIS	9.10E-02	IRIS	B2
1,1-dichloroethene	NA		9.00E-03	IRIS	NA		9.00E-03	HEA	1.20E+00	IRIS	6.00E-01	IRIS	C
1,2-dichloroethene(trans)	NA		2.00E-02	IRIS	NA		2.00E-01	HEA	NA		NA		
1,2-dichloropropane	NA		NA		NA		NA		NA		6.80E-02	HEA	B2
ethylbenzene	ND		1.00E-01	IRIS	NA		1.00E+00	HEA	NA		NA		D
methylene chloride	NA		6.00E-02	IRIS	NA		NA		1.40E-02	IRIS	7.50E-03	IRIS	B2
styrene	NA		2.00E-01	IRIS	NA		2.00E+00	HEA	2.00E-03	HEA	3.00E-02	HEA	B2
tetrachloroethene	NA		1.00E-02	IRIS	NA		1.00E-01	HEA	NA		NA		
toluene	2.00E+00	HEA	3.00E-01	IRIS	2.00E+00	HEA	4.00E-01	HEA	NA		NA		
1,1,1-trichloroethane	3.00E-01	HEA	9.00E-02	IRIS	NA		9.00E-01	HEA	1.60E-05	HEA	5.70E-02	HEA	
1,1,2-trichloroethane	NA		4.00E-03	IRIS	NA		4.00E-02	HEA	5.70E-02	IRIS	5.70E-02	IRIS	C
trichloroethene (d)	NA		NA		NA		NA		1.70E-02	HEA	1.10E-02	HEA	B2
trichloroflouromethane	2.00E-01	HEA	3.00E-01	HEA	NA		7.00E-01	HEA	NA		NA		
vinyl chloride	NA		NA		NA		NA		2.95E-01	HEA	2.30E+00	HEA	A
xylenes	4.00E-01	IRIS	2.00E+00	IRIS	NA		4.00E+00	HEA	NA		NA		
anthracene	NA		3.00E-01	HEA	NA		3.00E+00	HEA	NA		NA		
benzoic acid	NA		4.00E+00	IRIS	NA		4.00E+00	HEA	NA		NA		
bis(2-ethylhexyl) phthalate	ND		2.00E-02	IRIS	NA		2.00E-02	HEA	ND		1.40E-02	IRIS	B2
butyl benzyl phthalate	NA		2.00E-01	IRIS	NA		2.00E+00	HEA	NA		ND		C
di-n-butyl phthalate	ND		1.00E-01	IRIS	NA		1.00E+00	HEA	ND		ND		
flouranthene	NA		4.00E-02	HEA	NA		4.00E-01	HEA	NA		NA		
flourene	NA		4.00E-02	HEA	NA		4.00E-01	HEA	NA		NA		
naphthalene	ND		4.00E-03	HEA	NA		4.00E-03	HEA	NA		NA		
phenol	NA		6.00E-01	IRIS	NA		6.00E-01	HEA	NA		NA		D
pyrene	NA		3.00E-02	HEA	NA		3.00E-01	HEA	NA		NA		
carcinogenic PAHs	NA		NA		NA		NA		6.1	(e)	11.5	(e)	

TABLE 4 [illegible]XICITY PARAMETERS USED IN THE RISK ASSESSMENT (Sheet 2 of

Chemical of Potential Concern	Reference Dose (RfD) (mg/kg/day)				Subchronic Reference Dose (RfDs) (mg/kg/day)				Cancer Potency Factor (mg/kg/day)^-1				
	Inhalation	Source (a)	Oral	Source (a)	Inhalation	Source (a)	Oral	Source (a)	Inhalation	Source (a)	Oral	Source (a)	of Evide
chlordane	ND (b)		6.00E-05	IRIS	NA		6.00E-05	HEA	1.30E+00	IRIS	1.30E+00	IRIS	B2
4,4 DDT	NA (c)		5.00E-04	IRIS	NA		5.00E-04	HEA	3.40E-01	IRIS	3.40E-01	IRIS	B2
dieldrin	NA		5.00E-05	IRIS	NA		5.00E-05	HEA	1.60E+01	IRIS	1.60E+01	IRIS	B2
heptachlor epoxide	NA		1.30E-05	IRIS	NA		NA		9.10E+00	IRIS	9.10E+00	IRIS	B2
PCBs (arochlor 1260)	NA		NA		NA		NA		ND		7.70E+00	IRIS	B2
antimony	NA		4.00E-04	IRIS	NA		4.00E-04	HEA	NA		NA		
arsenic	NA		1.00E-03	HEA	NA		1.00E-03	HEA	5.00E+01	IRIS	1.80E+00		A
barium	1.00E-04	HEA	7.00E-02	IRIS	1.00E-03	HEA	7.00E-02	HEA	NA		NA		
beryllium	ND		5.00E-03	IRIS	NA		5.00E-03	HEA	8.40E+00	IRIS	4.30E+00	IRIS	B2
cadmium; food (RfD)	ND		1.00E-03	IRIS	NA		NA		6.10E+00	IRIS	ND		B1
cadmium; water (RfD)	-		5.00E-04	IRIS	NA		NA		-		-		
chromium; hexavalent	ND		5.00E-03	IRIS	NA		2.00E-02	HEA	4.10E+01	IRIS	ND		A
chromium; trivalent	ND		1.00E+00	IRIS	NA		1.00E+01	HEA					
copper	ND		3.70E-02	HEA	NA		3.70E-02	HEA	NA		NA		
manganese	3.00E-04	HEA	1.00E-01	IRIS	NA		NA		NA		NA		
mercury	ND		3.00E-04	HEA	NA		3.00E-04	HEA	NA		NA		
nickel	ND		2.00E-02	IRIS	NA		2.00E-02	HEA	8.40E-01	IRIS	ND		A
silver	NA		3.00E-03	IRIS	NA		3.00E-03	HEA	NA		NA		
selenium	NA		3.00E-03	HEA	NA		NA		NA		NA		
thallium	NA		7.00E-05	HEA	NA		7.00E-04	HEA	NA		NA		
vanadium	NA		7.00E-03	HEA	NA		7.00E-03	HEA	NA		NA		
zinc	ND		2.00E-01	HEA	NA		2.00E-01	HEA	NA		NA		
cyanide	NA		2.00E-02	IRIS	NA		2.00E-02	HEA	NA		NA		

(a) IRIS Integrated Risk Information System (USEPA)
HEA Health Effects Assessment Summary Tables
(b) ND Not Determined
(c) NA Not Applicable or Not Available
(d) Cancer Potency Factors for Trichloroethene have been withdrawn from IRIS as of 8/90.
(e) Cancer Potency Factors for PAHs have been removed from IRIS and HEA. These are interim factors recommended by U.S. EPA's ECAO.
(f) Reference Dose for lead estimated from the SDWA MCL by assuming an adult (75kg) drinking 2 liters of water per day.

TABLE 5 SUMMARY OF BASELINE RISK ASSESSMENT RESULTS FOR THE GENZALE PLATING COMPANY SITE

	Current Off-Site Residents from Air Pathways	Current GPC Worker	Future Off-Site Residents from Air Pathways and Groundwater Use	Future On-Site Adult Resident		Future On-Site Child Resident		Future GPC Worker	Future Site Development Worker
				Soil Pathways	Groundwater Pathways	Soil Pathways	Groundwater Pathways		
Hazard Index	6.06E-04	2.20E+00	8.02E+01	2.60E+00	8.02E+01	1.64E+01	1.14E+02	2.20E+00	2.30E+01
% Contribution by pathway:									
Inhalation	100%	-	0.1%	-	0.1%	-	0.2%	-	89.3%
Ingestion	-	42.4%	99.9% (groundwater)	42.4%	99.9%	32.8%	99.8%	42.4%	8.3%
dermal	-	57.6%	-	57.6%	-	67.2%	-	57.6%	2.4%
% Contribution by selected chemicals (all pathways):									
antimony			10.8%		10.8%		10.3%		
barium	02%								88.9%
chromium	20.6%	31.0%	43.7%	64.0%	43.7%	31.0%	16.6%	31.0%	3.1%
nickel	9.9%	69.8%	36.3%	30.8%	36.3%	69.6%	64.9%	69.8%	6.6%
Excess Cancer Risk	9.62E-06	2.27E-05	2.66E-03	4.61E-05	2.66E-03	2.03E-04	1.70E-03	2.27E-05	9.96E-04
% Contribution by pathway:									
Inhalation	100%	26.0%	4.1%	34.4%	3.8%	37.6%	3.8%	26.0%	96.6%
Ingestion	-	15.9%	95.9%(groundwater)	14.1%	96.2%	9.6%	96.2%	15.9%	0.1%
dermal	-	58.1%	-	51.5%	-	52.8%	-	58.1%	3.3%
% Contribution by selected chemicals (all pathways):									
chromium	96.1%	24.9%		33.1%		36.1%		24.9%	92.6%
nickel	3.8%								4.0%
PAHs		53.3%	30.1%	47.2%	30.4%	45.4%	30.4%	53.3%	
1,1,1-TCA			30%		30.1%		30.1%		
1,1-DCE			21.3%		21.4%		21.4%		

POOR QUALITY ORIGINAL

TABLE 6

SUMMARY OF COST ESTIMATES FOR ALTERNATIVE GW-3: PUMPING/PRETREATMENT/AIR STRIPPING/REINJECTION

ITEM		COST (1991 DOLLARS)	
		CAPITAL	ANNUAL O&M
1.	Support Facilities	22,100.00	-
2.	Groundwater Extraction	37,200.00	700.00
3.	Collection	18,300.00	-
4.	Pretreatment	228,600.00	11,500.00
5.	Air Stripping	80,900.00	4,300.00
6.	Treated Water Reinjection	40,100.00	200.00
7.	Electricals	82,000.00	-
8.	Instrumentation & Controls	85,000.00	-
9.	Process Water Supply	17,000.00	-
10.	Foundation and Pads	50,000.00	-
11.	Miscellaneous	10,000.00	-
12.	Contingency	143,900.00	9,100.00
13.	Engineering, Legal and Administrative	108,000.00	-
14.	Labor	-	87,600.00
15.	Maintenance	-	77,700.00
16.	Monitoring Wells	48,400.00	-
	Total	971,500.00	191,100.00
	TOTAL PRESENT WORTH*	3,909,200	

*Present worth analysis based on a 30-year period and 5 percent discount rate.

Table 7

SUMMARY OF COST ESTIMATES FOR ALTERNATIVE SC-5: IN-SITU VACUUM EXTRACTION/SURFACE EXCAVATION/EXCAVATION OF LEACHING PITS/OFF-SITE TREATMENT AND DISPOSAL/BACKFILL WITH CLEAN OFF-SITE SOIL

ITEM	COST (1991 DOLLARS) CAPITAL	ANNUAL O&m
1. Warning Signs	100.00	-
2. Site Preparation	3,000.00	-
3. Support Facility	13,600.00	-
4. In-Situ Vacuum Extraction	157,500.00	-
5. Surface Soil Excavation	30,400.00	-
6. Excavation of Leaching Pits	9,600.00	-
7. Off-Site Treatment (Stabilization) and Disposal	1,020.000.00	-
8. Treatability Study	50,000.00	-
9. Clean Fill	32,400.00	-
10. Contingency	263,320.00	-
11. Engineering, Legal and Administrative	197,490.00	-
TOTAL	1,777,410.00	-

* First year O&M cost included in the capital cost.

APPENDIX III

NYSDEC LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233 -7010

Thomas C. Jorling
Commissioner

MAR 2 2 1991

Ms. Kathleen C. Callahan
Director
Emergency & Remedial Response Division
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

Re: Draft Record of Decision
Genzale Plating Site - ID No. 130018

Dear Ms. Callahan:

The New York State Department of Environmental Conservation (NYSDEC) approves the Record of Decision for the Genzale Plating Site #130018 with the following conditions:

1. During design:

   a) Surface soil sampling will be initiated to better delineate the area and the total volume of soil to be excavated.

   b) The soil cleanup levels for inorganic compounds will be determined subject to NYSDEC approval, and will be used to delineate the extent of excavation.

2. During remediation:

   a) All leaching pits will be located and excavated. There are four known leaching pits; however, more are suspected.

   b) The metallic anomalies detected during the RI will be properly characterized and handled appropriately.

3. Off-site residential surface soils adjacent to the site will be sampled either during the design or during the second operable unit.

4. Warning signs will be posted outside the site as soon as possible.

Please contact Mr. Michael J. O'Toole, Jr. if you have any questions or comments regarding this matter.

Sincerely,

Edward O. Sullivan
Deputy Commissioner

APPENDIX IV

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
GENZALE PLATING COMPANY
FRANKLIN SQUARE , NEW YORK

The U.S. Environmental Protection Agency ("EPA") held a public comment period from February 22, 1991 through March 23, 1991 to receive comments from interested parties on the final Remedial Investigation and Feasibility Study ("RI/FS") reports and Proposed Plan for the Genzale Plating Company Superfund site ("Site").

A public participation meeting was conducted by EPA on March 13, 1991 at the Franklin Square Public Library, Franklin Square, New York to discuss remedial alternatives, to present EPA's preferred remedial alternative, and to provide an opportunity for the interested parties to present oral comments and questions to EPA.

This responsiveness summary provides a synopsis of citizen's comments and concerns about the Site as raised during the public comment period, and EPA's responses to those comments. All comments summarized in this document were considered in EPA's final decision for selection of the remedial activities for cleanup of the Genzale Plating Company site.

This responsiveness summary is divided into the following sections:

I. Responsiveness Summary Overview - This section briefly describes the background of the Genzale Plating Company site and summarizes the proposed and selected alternatives.

II. Background on Community Involvement and Concerns - This section provides a brief history of community interests and concerns regarding the Genzale Plating Company site.

III. Summary of Public Comments and EPA's Responses - This section summarizes comments expressed verbally at the public meeting and provides EPA's responses to these comments.

IV. Appendices - This section includes a copy of the agenda for the public meeting (Appendix A) and the public meeting sign-in sheet (Appendix B).

I. RESPONSIVENESS SUMMARY OVERVIEW

Site Background

The Site includes the property located at 288 New Hyde Park Road in the Town of Franklin Square, Nassau County, New York. The Genzale Plating Company ("Company") facility is located in a primarily residential area.

The Company has operated an electroplating facility on the property since 1915. The property occupies an area of approximately 24,000 square feet. The western portion of the property is occupied by a two story building which houses the company office, plating facility, and chemical storage area. The eastern portion of the property is undeveloped and serves as an outdoor storage yard and parking lot.

Subsurface structures located in the yard include sanitary and industrial sewer lines, and four abandoned wastewater leaching pits, approximately 12 to 18 feet in depth.

Presently, the operation consists of electroplating automobile and houseware products using nickel and chrome. Past operations included anodizing and cadmium, zinc, and brass plating. The electroplating processes utilize several degreasing and cleaning agents, including organic solvents. Distillation of spent 1,1,1-trichloroethane is currently performed by the Company to recycle the product for re-use. Wastewater, which is currently treated and discharged to the municipal sewer system, was discharged in the past to the underground leaching pits.

In 1981, the Nassau County Department of Health ("NCDH") conducted an inspection of the Company which indicated that wastewater being discharged to the leaching pits exhibited heavy metal concentrations in excess of NYSDEC discharge standards. In June 1986, the Site was added to the EPA National Priorities List of Superfund sites.

A special notice letter was issued to the Company on December 31, 1987. Based upon the Company's response it was determined that it was financially unable to conduct the investigative activities at the Site. Accordingly, EPA proceeded with the RI/FS. In August 1989, EPA issued an Access Order to the Company so that field work could commence. As a result of the Company's failure to comply, EPA sought and was granted a court ruling in October 1989 which enforced the terms of the Order. Field work for the RI/FS began in November 1989 and was completed in February 1990.

Summary of Proposed and Selected Remedial Alternatives

The remedial alternatives considered for the Site are described in the RI/FS and Proposed Plan for this operable unit (referred to as operable unit one). All alternatives considered are listed below:

Remedial Alternatives for Contaminated Soils (SC)

- SC-1: No-Action
- SC-2: Surface Excavation/Off-Site Treatment and Disposal/Capping
- SC-3: In-Situ Vacuum Extraction/In-Situ Stabilization (Solidification)/Soil Cover
- SC-4: In-Situ Vacuum Extraction/Excavation/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil
- SC-5: In-Situ Vacuum Extraction/Surface Excavation/ Excavation of Leaching Pits/Off-Site Treatment and Disposal/Fill with Clean Off-Site Soil

Remedial Alternatives for Contaminated Groundwater (GW)

- GW-1: No-Action
- GW-2: Limited Action
- GW-3: Pumping/Metals Precipitation/Air Stripping/Reinjection
- GW-4: Pumping/Metals Precipitation/Carbon Adsorption/ Reinjection
- GW-5: Pumping/Metals Precipitation/UV-Chemical Oxidation/Reinjection
- GW-7: Pumping/Pretreatment/Discharge to Local Publically Owned Treatment Works (POTW)

EPA, with concurrence from the New York State Department of Environmental Conservation, chose a remedy which addresses the principal threats posed by the Site through a combination of a soil remedial alternative (SC-5) with active restoration of the groundwater (GW-3). Based on current information, these alternatives provide the best protection of human health and the environment.

II. BACKGROUND OF COMMUNITY INVOLVEMENT

Community interest in the Site has been high throughout the RI/FS process. The community has been kept aware of activities at the Site through local newspaper articles, fact sheets, press releases, public notices, and public information meetings.

The major concern expressed by the community is the migration of contaminants into the local public water supply wells and the close proximity of the Site to residences.

III. SUMMARY OF PUBLIC COMMENTS & EPA'S RESPONSES

Comments expressed at the public meeting held on March 13, 1991 are summarized below. No written comments were received during the public comment period.

Specific Questions Regarding the RI/FS and Proposed Alternative

COMMENT: A representative from the Franklin Square Water District inquired about the sampling results of two water district supply wells.

RESPONSE: All of the water supply wells sampled, those belonging to the Franklin Square Water District ("FSWD") and the Jamaica Water Supply Company ("JWSC"), had either very minimal or no contamination. A sample taken from FSWD well # 7117 detected trichloroethylene at 5 parts per billion ("ppb"), which is the maximum contaminant level allowable. A sample taken from JWSC well # 4298 detected trichloroethylene at an estimated quantity of 16 ppb. Samples from FSWD well # 3604 and JWSC well # 5155 detected no volatile organic compounds above allowable limits. No heavy metals, in excess of allowable limits, were detected in any of the above four water supply wells.

COMMENT: A resident asked whose responsibility it is to operate and maintain the treatment system during its use.

RESPONSE: The EPA would fund the first ten years of the remedial action. Thereafter, the State of New York would be responsible for the long-term maintenance of the treatment system.

COMMENT: A resident wanted assurance that EPA would be working closely with the local water districts.

RESPONSE: EPA has worked with both the Franklin Square Water District ("FSWD") and the Jamaica Water Supply Company ("JWSC") during the remedial investigation. Both FSWD and JWSC will be involved with EPA during the design of the treatment system for this first operable unit of the Site and will also be involved in developing the sampling plan for the second operable unit, which will investigate a downgradient plume of contamination. It is possible that FSWD and/or JWSC wells will be sampled during the second operable unit.

COMMENT: A resident wanted to know why it took so long for the sampling results to become available.

RESPONSE: After the soil and groundwater samples were collected between November 1989 through February 1990, they were all analyzed by a certified laboratory and then validated to ensure the quality of the results. This process took about 4 - 5 months. Once all the data was compiled, EPA evaluated the data to determine whether the results pose a risk. All the data results and the risk results have been summarized and explained in the RI report.

COMMENT: A resident asked whether the same type of treatment proposed for the Genzale Plating site is currently in operation at any other sites on Long Island.

RESPONSE: At present, similar technologies have been proposed for use at other sites on Long Island. A similar groundwater pump and treat system involving metals precipitation is currently being designed for the Preferred Plating site, located in Farmingdale, Suffolk County. The design is scheduled to be completed in September 1991. Vacuum extraction has been selected for other sites, but is currently still in the design stage.

COMMENT: A resident asked if the treatment system would be continuously operating and how loud the vacuum extraction process would be.

RESPONSE: The groundwater pump and treat system should operate on a continuous basis, 24 hours a day. The vacuum extraction process, will take place during normal working hours, approximately 9 a.m. through 5 p.m. Without special housing, the vacuum extraction process reaches approximately 80 decibels. The system can be designed with a special housing encasing it, so the noise level will be greatly reduced. The entire vacuum extraction process, from mobilization and implementation through completion, should require six months.

COMMENT: A resident asked how long it would be before the treatment systems are designed and constructed and EPA was back on the property.

RESPONSE: The design for both the groundwater treatment system and the soil treatment and excavation system will begin in October 1991 and will require 18 to 24 months for completion. EPA expects to be constructing the treatment systems on the property by October 1993. Construction of both the vacuum extraction process and the groundwater treatment system will not be extensive. Construction of the vacuum extraction process must first involve the installation of the extraction wells. The groundwater treatment units are readily available and can be brought to the property quickly. Extraction and reinjection wells will need to be installed first.

COMMENT: A resident asked when the drums on the property would be removed.

RESPONSE: The 65 drums currently on the property resulted from the remedial investigation field work. They contain discarded protective clothing, drill cuttings, and decontamination and development water. Normally, the drums would remain on a site until EPA is constructing the treatment system. It is EPA's responsibility to ensure the integrity of the drums. Presently, all 65 drums are in good shape and do not pose any danger. If the drums show signs of decay or deterioration, they will either be overpacked or removed promptly from the property.

COMMENT: A resident asked whether the treated groundwater that is to be reinjected into the aquifer will be sampled.

RESPONSE: The groundwater treatment system will be designed to include continuous monitoring and sampling of the treated water to ensure the efficiency of the system and to ensure that federal and/or state drinking water standards are being met prior to reinjection.

COMMENT: A resident asked how many gallons per day will be pumped through the treatment system.

RESPONSE: The current pump rate estimate is 28,800 gallons per day. This estimate will be further refined during the design phase.

COMMENT: A resident asked what would happen to the property if the Genzale Plating Company were to go out of business.

RESPONSE: No matter if the Genzale Plating Company or anyone else is on the property, EPA's treatment system will remain on the property until the groundwater is remediated.

COMMENT: A resident asked how long the treatment system would remain on the property.

RESPONSE: The soils treatment should be completed in six months. The current estimate for the length of time required for remediation of the groundwater is 30 years. Since the source of contamination in the soils will be removed prior to the full implementation of the groundwater treatment system, the estimated time for remediation may decrease. The treatment system will be continuously monitored and the remediation time frame will be adjusted accordingly.

COMMENT: A resident asked if the treatment system would be enclosed to ensure its safety from children.

RESPONSE: A temporary structure will be placed over the most of the groundwater treatment system to limit access and to protect the treatment units from the elements. The exact details and dimensions of the housing structure will be determined during the design phase.

COMMENT: A resident asked if the treatment system would be visible from the curb side of the property.

RESPONSE: The only part of the treatment system which may be visible from outside of the property will be the air stripper. This unit will be approximately 16 feet high. The fence surrounding the property is about 10 - 12 feet in height. Presently, it appears that the treatment system will be located in a corner of the property. The air stripper will most likely be situated behind one of the tall trees bordering the property making it a bit less noticeable from the curb.

COMMENT: A resident asked if any types of signs would be placed on the property and if EPA provides for guards or security.

RESPONSE: Signs which inform the public of the presence of a Superfund site and the name of the site are commonly placed on the site during remedial action. EPA recognizes that the community is sensitive over having a Superfund site in this very residential area. EPA is willing to discuss the use of signs with the community. One approach would be to install warning an "no trespassing" signs only.

COMMENT: A resident asked where EPA would be sending the excavated soils and sludges from the treatment system and why it would be acceptable to place contaminated material in another location.

RESPONSE: Any excavated soils, sediments, or sludges resulting from the treatment system will be transported off-site to an EPA-permitted facility. This facility, or landfill, must be in compliance with EPA's Resource Conservation and Recovery Act. These facilities are strictly regulated and controlled to ensure that no contaminants can migrate from the landfills into the surrounding environment. Any excavated soils and sludges will first be treated or stabilized prior to their disposal in the landfill to ensure that contaminants will not leach out. The exact location of this facility has not been determined as yet.

Questions Regarding the Present Status of the Genzale Plating Company

COMMENT: A resident asked if the Genzale Plating Company is currently in operation on the property.

RESPONSE: Yes, the company still operates on the property. The leaching pits are no longer used for discharge of waste water. The company now treats their waste water prior to discharge to the municipal sewer system.

COMMENT: A resident asked whether the Genzale Plating Company could continue operating on the property during the remedial action.

RESPONSE: The plating company can continue to operate on the property as long as their operations do not interfere with EPA's actions and they are no longer contributing to the contamination problem. The company must continue to comply with the terms of their operating license.

General Superfund Questions

COMMENT: A resident asked how many ongoing Superfund sites are located on Long Island and how many of those represent emergency situations.

RESPONSE: EPA has assessed sites on the National Priorities List to determine which sites pose imminent threats that warrant emergency action. These actions may be temporary or permanent in nature and can range from relocation of residents to provision of alternative water supplies or physical removal, treatment, or containment of wastes. These actions are taken to reduce imminent danger without delay.

At present, there are approximately 20 - 25 Superfund sites listed on the National Priorities List in Nassau and Suffolk Counties. Very few of these sites currently have ongoing emergency removal actions. One removal action is currently being conducted at the Mattiace site in Glen Cove, Nassau County, to repair a collapsed retaining wall at the site. Removal actions have been completed at other Long Island sites such as at the Rowe Industries site located in Sag Harbor, Suffolk County (provision of an alternative water supply) and at the Claremont Polychemical site located in Old Bethpage, Nassau County and the Circuitron site located in Farmingdale, Suffolk County (removal of contaminated materials stored in drums, tanks, etc.)

COMMENT: A resident asked if EPA has any policy allowing firms in the vicinity of a site to bid on the work being conducted at the site, in order for federal monies being spent to go back into the community.

RESPONSE: EPA retains several contractors under its Alternative Remedial Contracting Strategy ("ARCS") and Technical Enforcement Support ("TES") programs. Both ARCS and TES contracts were competitively bid to ensure equality and fairness and several contracting firms were selected into each program, providing EPA with a fast method of procuring a contractor to repond quickly to a given site situation. EPA does not have a set policy to use local contracting firms. The U.S. Army Corps of Engineers ("COE") will, at times, oversee remedial actions for EPA and will open bids to all interested parties. Local firms may possibly have the opportunity to responsd to a bid invitation from the COE or through subcontract to a prime EPA contractor.

Questions Regarding Enforcement Issues

COMMENT: A resident asked if EPA has any indication as to whether the Company could contribute financially to the project.

RESPONSE: Based on the information gathered at this time, the potentially responsible party, Genzale Plating, is not financially viable to fund a remedial action of this magnitude. Initially, the Company expressed an interest in conducting the remedial investigation, but determined it was impossible upon realizing the scope of the work involved. The federal government is in the process of issuing a notice of lien on the property, which would enable EPA to recover monies paid for the property up to the amount expended at the Site.

APPENDIX A

PUBLIC MEETING AGENDA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

AGENDA

Information Meeting
Genzale Plating Superfund Site
Franklin Square, New York

Wednesday, March 13, 1991
7:00 P.M.

I. Welcome & Introduction	Cecilia Echols Community Relations Coordinator U.S. EPA, Region 2
II. Overview of Superfund	Douglas Garbarini Chief, Eastern New York/ Caribbean Superfund Section U.S. EPA, Region 2
III. Site History	Janet Cappelli Remedial Project Manager U.S. EPA, Region 2
IV. Remedial Investigation Results	Tom Fowler Field Work Supervisor EBASCO Services, Inc. (Consultant to EPA)
V. Risk Assessment	Marina Stefanidis U.S. EPA, Region 2
VI. Feasibility Study Alternatives	Delip [illegible] Feasibility Study Leader EBASCO Services, Inc. (Consultant to EPA)
VII. Proposed Alternative	Janet Cappelli
VIII. Questions and Answers	
IX. Closing	

APPENDIX B

PUBLIC MEETING SIGN-IN SHEETS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
PUBLIC MEETING
FOR
Genzale Plating Superfund Site
Franklin Square, New York

March 13, 1991
MEETING ATTENDEES

(Please Print)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING	MAILING LIST
Virginia Johnson				516 872-9550		
For Congressman Ray McGrath	203 Rockaway Ave	V.S.	11580			✓
M. Canzale	288 New Hyde Pk. Rd	Frankl. Sq.				
T. Feller	252 Kolb Ave	Fr Sq				
E. Feller	252 Kalb Av	Fr Sq.				
Laurie Lueker	240 Old Country Rd, Mineola			516-535-4948	NCDH	
Anne Porto	1080 Tulip Ave	FR SQ	516	437-7465	FR SQ. Womans Club	
Maurielle [illegible]	235 Lucille Ave	Elmont	11003	437-6874	[signature]	
Charles Hughes	120 Madison Ave	FR SQ	11010	354-1631		
Mr + Mrs. R Statten	287 Kalb Ave,	Fr. Sq.	11010			
Rita Mezzapelle	591 Bauer Ct	Elmont	11003	354-3379	Elmont Herald	
Caren Prill	263 Kalb Ave	Fr Sq	11010	437-2089		
Joseph J. Ra	Town Hall Plaza	Hempstead	11550	489-5000	Town of Hempstead	✓
Leonard Falco	FR. SQ. WATER DIST 895 Schroeter Ave FR. SQ., N.Y. 11010		11010	354-0780	FR SQ WATER DIST	✓

Added

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
PUBLIC MEETING
FOR
Genzale Plating Superfund Site
Franklin Square, New York

March 13, 1991
MEETING ATTENDEES

(Please Print)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING	MAILING LIST
B. KELLAR					EBASCO	
P. Muole	939 3rd Av.	N. H.	11010			
N. POVEROMO	1036 RENMORE AVE	FR. Sq	11010	775-7006		
L. McAlinney	190 Wellington Rd	Elmont	11003	NA	C.M.H.S.	
Robert Sakant					Jamaica Water Supply Company	
THOMAS FURISES	278 KALB AVE	Fr. Sq	11010	488-1813		
VITO GENOVA	994 Southern Dr	Fr Sq	11010	568-0463	[illegible]	Yes
MARY NAGLER	959 CHERRY LA	FR. Sq.	11010	352-8896		
LAWRENCE NAGLER	"	"	"	"		
Christine Graffeo	320 New Hyde Pk Rd	Fr Sq	11010	352-7723		
I. KALAN	270 KALB Ave	FR SQ	110[illegible]	775-3966		

APPENDIX V

ADMINISTRATIVE RECORD INDEX

GENZALE PLATING COMPANY
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

REMEDIAL INVESTIGATION

WORK PLANS

P. 1 - 108 — Report: Engineering Investigation at Inactive Hazardous Waste Sites in the State of New York - Phase 1- Preliminary Investigation, prepared by Woodward-Clyde consultants, Inc. September 30, 1983.

P. 109 - 216 — Report: Final Work Plan for RI/FS - Genzale Plating Company Site, Franklin Square, N.Y., prepared by EBASCO, October, 1988.

P. 217 - 360 — Report: Final Field Operations Plan (FOP) for RI/FS - Genzale Plating Company Site, Franklin Square, N.Y., prepared by EBASCO, October, 1988.

REMEDIAL INVESTIGATION REPORTS

P. 361 - 556 — Report: Final Remedial Investigation Report, prepared by EBASCO, Volume I of III, February, 1991.

P. 557 - 569 — Report: Final Remedial Investigation Report, prepared by EBASCO, Volume II of III, February, 1991.

P. 570 - 765 — Report: Final Remedial Investigation Report, prepared by EBASCO, Volume III of III, February, 1991.

FEASIBILITY STUDY

FEASIBILITY STUDY REPORTS

P. 766 - 968 — Report: Draft Final Feasibility Study Report, prepared by EBASCO, February, 1991.

ENFORCEMENT

ADMINISTRATIVE DECREES

P. 969 - 992A — Memorandum of Decision - U.S.A. against M. Genzale Plating, Inc., Michael Genzale and Pasquale Genzale, October 13, 1989.

CORRESPONDENCE

P. 993 - 995 Letter to Mr. Pasquale Genzale, Genzale Plating Corporation, from Mr. Stephen Luftig, U.S. EPA, Re: Special Notice Letter Pursuant to Section 122(e) - Genzale Plating Site, Franklin Square, New York, December 31, 1987.

PUBLIC PARTICIPATION

COMMUNITY RELATIONS PLANS

P. 996 - 1020 Report: Final Community Relations Plan For the Genzale Plating Site, Town of Franklin Square, New York, prepared by EBASCO, November, 1988.

FACT SHEETS AND PRESS RELEASES

P. 1021 - 1022 Fact sheet: Genzale Plating Site, Town of Hempstead, Nassau County, NY, November, 1989.

P. 1023 - 1024 Press Release: U.S. EPA TO HOLD PUBLIC AVAILABILITY SESSION ON GENZALE PLATING CO. SUPERFUND SITE IN FRANKLIN SQUARE, NEW YORK, Prepared by, U.S. EPA, November 14, 1989.

REQUEST FOR FOIA

P. 1025 - 1030 Letter to Honorable Raymond J. McGrath, U.S. Congressman, from Mr. William Muszynski, U.S. EPA, Re: Request for information, January 9, 1989.

PROPOSED PLAN

P. 1031 - 1043 Proposed plan: Genzale Plating Company Site, U.S. EPA Region II, February, 1991.