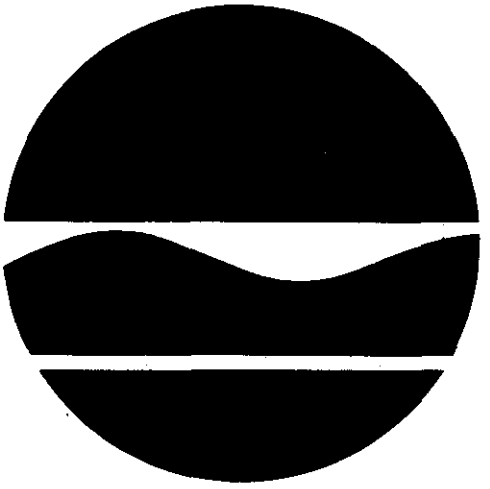
Record of Decision

Columbia Ribbon and Carbon Manufacturing Company Site

Also Known As Powers Chemco Site

I.D. Number 130028



March 1991

PREPARED BY:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

RECORD OF DECISION

COLUMBIA RIBBON AND CARBON MANUFACTURING COMPANY SITE

ALSO KNOWN AS

THE POWERS CHEMCO SITE

NASSAU COUNTY, NEW YORK

ID NUMBER 130028

PREPARED BY

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

MARCH 1991

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Columbia Ribbon and Carbon Manufacturing Company Site
Also Known As: Powers Chemco Site
City of Glen Cove
Nassau County, New York
Site Code: 130028

STATEMENT OF PURPOSE

This document describes the selected remedial action for the Columbia Ribbon and Carbon Manufacturing Company Site "Columbia" (also known as the Powers Chemco Site), developed in accordance with the New York State Environmental Conservation Law (ECL), and consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC Section 9601, et. seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Exhibit A identifies the documents that comprise the Administrative Record for the site. The documents in the Administrative Record are the basis for the proposed remedial action.

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, present a current or potential threat to public health, welfare, and the environment.

STATEMENT OF BASIS

This decision is based upon the administrative record for the Columbia Site. A copy of the record is available for public review and/or copying at the following locations:

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010
Hours: 8:30 AM - 4:45 PM Monday - Friday

New York State Department of Environmental Conservation
Region 1 Office
SUNY Campus, Building 40
Stony Brook, New York 11794
Hours: 8:30 AM - 4:30 PM Monday - Friday

Glen Cove Public Library
Glen Cove Avenue
Glen Cove, New York 11545

The following documents are the primary components of the administrative record:

A. "Remedial Investigation and Feasibility Study: Former Columbia Ribbon and Carbon Company Disposal Site Glen Cove, New York," prepared by Fred C. Hart Associates, Inc.; January 31, 1991.

B. "Supplemental Hydrogeologic Investigation of the Former Columbia Ribbon and Carbon Company Waste Disposal Site," prepared by Fred C. Hart Associates, Inc.; October 1986.

C. "Engineers Certification Report: Removal of Drums and Contaminated Soils from the Former Columbia Ribbon and Carbon Co. Site; Glen Cove, NY," prepared by Fred C. Hart Associates, Inc.; September 1984.

D. "Investigation and Hydrogeologic Assessment of the Former Columbia Ribbon and Carbon Company Waste Disposal Site," prepared by Fred C. Hart Associates, Inc.; April 1984.

DESCRIPTION OF SELECTED REMEDY

The major elements of the selected remedy can be summarized as follows:

- Perform a pilot scale test at the site for a dual phase groundwater/soil vapor vacuum extraction and treatment system to refine the estimates for a full scale treatment system. A full scale system will be designed and constructed based upon the results of the pilot test.

- Groundwater will be extracted using vacuum lift and/or pumping from recovery wells. Activated carbon will be used to treat contaminated groundwater. Treated groundwater will be discharged to the Glen Cove Creek or to the local Publicly Owned Treatment Works.

- Contaminated soil will be treated in-situ by vacuum extraction. Soil vapor laden with contaminants from the soil will be treated by either activated carbon, catalytic oxidation, vapor incineration, or a combination of these depending upon the results of the pilot test.

- Spent activated carbon will be regenerated rather than disposed, to the extent practicable.

If the results of the pilot test show that remediating the site using the dual phase vacuum extraction system is significantly more expensive than projected in the RI/FS report, an alternate method that is also capable of achieving the remedial goals for the site will be implemented. This would consist of extracting groundwater using submersible pumps in a smaller number of recovery wells, using air stripping or activated carbon to treat groundwater, and treating soil by flushing with treated groundwater. It is projected that it would take much longer to achieve remedial goals with this method (8+ years vs. 1-2 years) than the vacuum extraction system. Details of this are described below and in the RI/FS Report. Also, if the results of the pilot test provide data indicating that the pump-and-treat alternative would actually perform significantly better than predicted by the RI/FS Report, this alternative may be reconsidered for implementation.

DECLARATION

The selected remedy is designed to be protective of human health and the environment, is designed to comply with applicable State environmental quality standards, and is cost effective. This remedy satisfies the Department's preference for treatment that reduces the toxicity, mobility, or volume of hazardous substances, pollutants or contaminants as the principal goal.

3/22/91
Date

Edward O. Sullivan
Deputy Commissioner
Office of Environmental Remediation

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RECORD OF DECISION
COLUMBIA RIBBON AND CARBON COMPANY SITE
A.K.A. POWERS CHEMCO SITE (#130028)

I. SITE LOCATION AND DESCRIPTION

The former Columbia Ribbon and Carbon Manufacturing Company ("Columbia") disposal site is located in the City of Glen Cove, New York, Nassau County. The site is approximately 1200 feet north and 60 feet above the eastern end of Glen Cove Creek, which empties into Hempstead Harbor. Figure 1 shows the location of the site with respect to Glen Cove.

To the north and east of the site, properties are predominantly residential. To the west of the site is an industrial corridor that includes four other inactive hazardous waste disposal sites. These are the Mattiace Petro Chemicals Site (#130017), the Li Tungsten Site (#130046), the Captain's Cove Condominiums Site (#130032), and the Edmos Corporation Site (#130036).

The disposal area is approximately one and one-half acres in size and is being used as a parking area by the current owner, Konica Imaging U.S.A., Inc., (formerly Powers Chemco, Inc.). Figure 2 is a site plan for the site showing its approximate dimensions and orientation with respect to the surrounding buildings.

There are three principal aquifers in the area of the site. These are the upper glacial, Magothy, and Lloyd aquifers. Also, local bodies of perched groundwater are common in the area. The Magothy aquifer is the principal source of drinking water in the vicinity of the site. The City of Glen Cove draws water from the 200-300 foot zone of the Magothy. Based upon regional hydrogeological data, groundwater in the shallow upper glacial aquifer flows to the south towards Glen Cove Creek. Local water supply is not impacted by contamination from the site.

II. SITE HISTORY

For an undetermined period prior to 1979, Columbia disposed of wastes from the production of blue printing inks, carbon paper, and typing ribbon in open pits behind their manufacturing buildings. Apparently, wastes from 55-gallon drums were dumped into the open pits. The drums were then crushed and added to the pits before burial. An aerial photograph taken between 1950 and 1960 showed the location of two or three of these pits. Additionally, wastes were pumped through a two inch galvanized pipe from the Columbia plant directly into the pits. The hazardous and industrial wastes disposed of in the area include, but were not necessarily limited to, toluene, ethylbenzene, ethylacetate, and other residues from the formulation of printing inks.

In 1979, Powers Chemco, Inc. (Chemco) purchased a parcel of land, including the disposal area, from Columbia for use as a parking area. Chemco, a manufacturer of photographic equipment and supplies, was unaware that the parcel was heavily contaminated with hazardous and industrial

wastes. In 1983, Chemco discovered the subsurface contamination while excavating in the area.

To determine the nature and extent of the contamination, Chemco hired Fred C. Hart Associates (FCHA) to perform a site investigation. The investigation was conducted during the period November 30, 1983 to February 3, 1984 and produced the report entitled, "Investigation and Hydrogeologic Assessment of the Former Columbia Ribbon and Carbon Company Waste Disposal Site," dated April 1984. The report concluded that the site contained approximately 6000 cubic yards of grossly contaminated soils, waste sludges, rags, filters, and other debris along with approximately 100 drums.

Based upon the conclusions of the report, Chemco presented to the Department of Environmental Conservation ("Department" or "NYSDEC") an interim remedial plan for the removal and disposal of the buried wastes and heavily contaminated soils at the site. The Department approved the plan and entered into a voluntary Order on Consent with Chemco on June 8, 1984 to implement the removal action.

Chemco retained Associated Chemical and Environmental Services (ACES) as the contractor to perform the removal action in accordance with the approved interim remedial plan. FCHA acted as the project manager and coordinator. Representatives from the Department and the Nassau County Health Department witnessed the work.

Excavations began on June 19, 1984 and continued through August 1984. Fifteen overlapping trenches were excavated (see figure 4). The extent of the excavations were determined by the visual observation of heavily contaminated soils and wastes. A total of 4,645 tons of contaminated soils and debris along with 267 mostly empty drums were transported off-site under manifests to the Fondessy Enterprises landfill in Oregon, Ohio. The average depth of the excavations was five feet. Excavations did not extend into saturated soils.

The results of the removal action were summarized in a FCHA report dated September 28, 1984 entitled, "Engineer's Certification Report: Removal of Drums and Contaminated Soils from the Former Columbia Ribbon and Carbon Co. Site." After reviewing additional information submitted in support of the report, the Department accepted the certification in April 1985.

A second field investigation was carried out during early 1986 to more carefully assess the potential for contaminant migration from the site and define the vertical and horizontal extent of groundwater contamination. The work was carried out under a second Order on Consent with the Department dated January 16, 1986. The November 1986 report entitled, "Supplemental Hydrogeologic Investigation of the Former Columbia Ribbon and Carbon Company Waste Disposal Site," concluded that the contaminants are confined in a shallow sand and gravel unit and are concentrated in the immediate area of the disposal site.

The initial and supplemental investigations were used along with information from the removal action as the basis for defining the nature and extent of the contamination at the site. Chemco then developed a Remedial

Investigation/Feasibility Study (RI/FS) work plan to examine alternatives for remediating the site. The RI/FS work plan called for the installation of two additional groundwater monitoring wells; one to replace a damaged well and one for use in a pump test to gather information on the yield and other characteristics of the sand and gravel unit. Additionally, the work plan identified a series of remedial alternatives to be evaluated in the feasibility study.

The agreement to perform the RI/FS was incorporated into a third Order on Consent signed April 4, 1988. The work was performed over the summer of 1988 and the first draft of the RI/FS Report was submitted in September 1988. The Department disapproved the first draft in May 1989. The second draft was submitted in March 1990 which was also disapproved in May 1990. The third draft was submitted February 1, 1991.

During the development of the RI/FS Report, Powers Chemco, Inc. was renamed to Chemco Technologies, Inc. which was subsequently purchased and renamed Konica Imaging U.S.A., Inc. A summary of the major milestones that have occurred during the course of the project are included as Exhibit B.

III. CURRENT SITE STATUS

A. Summary of Site Conditions:

For ease of reference, the following information summarizes the main characteristics of the Columbia site (all values are approximate):

Area to Remediate:	1.4 acres
Area of Highest Contamination:	0.5 acres
Average Depth to Water:	10 feet
Average Depth to Confining Unit:	20 feet
Approximate Volume to Remediate:	23,000 cubic yards
Contaminated Media:	groundwater & saturated soil

Predominant Contaminants:

Contaminant	Maximum Groundwater Concentration (ppb)
toluene	118,000
xylenes	2,510
ethylbenzene	503
benzene	471
phenol	133
1,1-dichloroethane	120
chloroethane	34
trichloroethene	30
tetrachloroethene	30
1,2-dichloroethene	30
1,2-dichloroethane	24

Disposal of sludges and residues from the manufacturing of blue printing inks, carbon paper, and typing ribbons in shallow pits contaminated soils and groundwater at the site. The wastes and heavily contaminated soils were excavated and disposed off-site in a removal action during 1984.

The geology and hydrogeology of the site are complex. The bulk of the contamination at the site appears to be contained within a saturated sand and gravel unit that is underlain by layers of clay and silt. This results in the sand and gravel unit resembling a perched groundwater unit. The unit may actually be divided into smaller units by fingers or lenses of clay and silt. The stability of the concentrations of the contaminants in the disposal area and the extremely steep concentration gradient outside of the disposal area indicate that the shape and composition of the confining layers greatly inhibit the vertical and horizontal migration of the contaminants. Tables 2, 3, and 5 summarize the groundwater analytical data for 1984, 1986, and 1988 respectively. Table 4 summarizes the concentration ranges along with federal and state water quality criteria and guidance values.

Regionally, groundwater in the upper glacial aquifer (shallowest and therefore threatened or contaminated by the site) flows to the south towards Glen Cove Creek which discharges into Hempstead Harbor. Local water supply is taken from groundwater at 200-300 feet below land surface in the Magothy aquifer.

B. Summary of Field Investigations:

The following paragraphs summarize the components and conclusions of the field investigations performed at the site. For more detailed information regarding the individual investigations or for additional regional information, refer to the appropriate report(s) listed in the Administrative Record (Exhibit A).

The initial hydrogeologic investigation performed between November 1983 and February 1984 was commissioned to (1) obtain a preliminary assessment of the extent of the soil and groundwater contamination resulting from Columbia's waste disposal practices, and (2) estimate the number of buried drums in the disposal area. The techniques employed to accomplish these goals included a records search, a soil vapor survey, three surface geophysical surveys (electrical resistivity, metal detection, and magnetometry) as well as the completion of 18 test pits and six soil borings.

The test pits and soil borings were completed to confirm the results of the indirect geophysical techniques. Five of the soil borings were converted to monitoring wells. The results of soil and groundwater analyses (pre-removal action) are summarized in Tables 1 and 2. The predominant compounds detected were benzene, toluene, ethylbenzene, and xylenes. These compounds were also found to be the predominant components in samples of ink and sludge taken from waste drums found in the test pits.

The test pits and soil borings indicate that the geology of the site is a complex combination of pockets of sand and gravel within deposits consisting largely of silt and/or clay. The disposal area appears to be largely contained within one of these sand and gravel units underlain by several layers of low permeability materials.

Based upon the results of the initial hydrogeologic investigation, the site was listed, in 1985, in the New York State Registry of Inactive Hazardous Waste Disposal Sites with a classification of "2." A class 2 site

is one which presents a significant threat to public health or the environment and requires action. Exhibit C is the excerpt from the Registry for this site.

The supplemental hydrogeologic investigation was undertaken to more fully characterize subsurface conditions after the source materials were removed during the 1984 excavations. The supplemental investigation consisted of four main components, (1) the completion of seven additional soil borings, six of which were converted to groundwater monitoring wells, (2) the sampling and analysis of groundwater from all monitoring wells, (3) the completion of three shallow borings to the northeast of the excavated area, and (4) the completion of a more detailed assessment of the geology and hydrogeology of the site.

Figure 3 shows the location of the groundwater monitoring wells. Figure 4 shows the boundary of the 1984 removal action. Comparing these figures and Table 3 (1986 Groundwater Analyses) supports the conclusion that the migration of the contaminants has largely been limited to the sand and gravel unit within the disposal area. The very steep decline in concentrations between the center of the disposal area (MW-4 to MW-5) and monitoring wells MW-8 and MW-11 further indicate the relative isolation of contaminants in the sand and gravel unit.

It is believed that the lower levels of contamination in wells MW-11 and MW-9/9A represent either a small amount of "leakage" from the disposal area or perhaps a regional low level contamination problem. It is likely that these two wells are not in the same hydrogeologic unit as the disposal area. As the remediation progresses, these wells will be monitored to determine if the concentrations decrease with time. If not, additional work will be needed to determine if the chemicals in these wells have a source separate from the disposal area.

Given the information from the initial investigation, it was believed that contamination may have spread under and past the production building to the east of the disposal area. Analytical results from wells MW-8, MW-9/9A, MW-10, and MW-11 indicated a hydrogeologic barrier between the disposal area and these wells. Therefore, additional wells were not installed.

During the initial investigation, groundwater monitoring showed the presence of arsenic and lead at concentrations slightly above NYS groundwater standards (see Table 4). These metals were also found in analyses of the waste materials. For the purpose of characterizing the site in investigations after the removal action, volatile organic compounds were chosen to act as indicator chemicals. The Department concludes that a monitoring program for metals is needed during site remediation to confirm that metal concentrations have decreased to levels below standards and remain at acceptable levels.

After the approval of the 1986 supplemental report, the Department concluded that the nature and extent of the contamination at the site had been adequately delineated. Chemco then proceeded to prepare a work plan for the performance of a Remedial Investigation/Feasibility Study (RI/FS). The RI/FS work plan was submitted in October 1987 and approved in December 1987. The work was carried out under a third order on consent between the Department and Powers Chemco dated April 4, 1988.

The 1988 field work consisted of the installation of two groundwater monitoring wells, the performance of a pump test, and the sampling/analysis of groundwater taken before and after the pump test. One of the wells was installed to replace a well which had become damaged (MW-3). As with the original well, the replacement well (MW-3R) has never yielded enough water for sampling. During 1990 MW-3R has consistently been found to be dry despite a year of greater than average precipitation. It is concluded that MW-3R is outside of the saturated sand and gravel unit containing the disposal area and is not screened deep enough to intercept the permanent water table at that location.

The second well was installed as a pump test well to gather information on the yield of the unit. This information was used along with slug test data from the other monitoring wells as the basis for the conceptual design of a pump-and-treat alternative in the feasibility study. The average hydraulic conductivity of the unit was estimated to be 3.6×10^{-5} feet per second and the average groundwater velocity was estimated to be 0.38 feet per day.

The analytical results of samples of groundwater taken from TW-1 before and after the pump test indicated essentially no change in the concentration of the detected contaminants over the course of the test period (less than five hours). As with previous results, toluene was present in the highest concentrations (62.8 ppm vs 2.5 ppm for the next highest constituent, xylenes).

IV. ENFORCEMENT STATUS

After discovering the subsurface contamination in the area purchased from Columbia, Powers Chemco, Inc. commissioned Fred C. Hart Associates to perform the initial site investigation. The results of the investigation were submitted to the Department. A series of three orders on consent between Chemco and the Department were signed as follows:

Orders on Consent

Date	Index No.	Subject of Order
June 8, 1984	T060684	Removal Action
Jan. 16, 1986	T071585	Supplemental Investigation
April 4, 1988	T0188	Remedial Investigation/Feasibility Study

A fourth order on consent is needed to implement the selected remedial alternative.

V. GOALS FOR THE REMEDIAL ACTIONS

The remedial alternative selected for the site by the Department was developed in accordance with the New York State Environmental Conservation Law (ECL) and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC Section 9601, et. seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The criteria used in evaluating the potential remedial alternatives can be summarized as follows:

1. Compliance with Applicable or Relevant and Appropriate New York State Standards, Criteria and Guidelines (SCGs)--SCGs are divided into the categories of chemical-specific (e.g. groundwater standards), action-specific (e.g. design of a landfill), and location-specific (e.g. protection of wetlands).

2. Protection of Human Health and the Environment--This criterion is an overall and final evaluation of the health and environmental impacts to assess whether each alternative is protective. This is based upon a composite of factors assessed under other criteria, especially short/long-term effectiveness and compliance with SCGs.

3. Short-term Impacts and Effectiveness--The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment is evaluated. The length of time needed to achieve the remedial objectives is estimated and compared with other alternatives.

4. Long-term Effectiveness and Permanence--If wastes or residuals will remain at the site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude and nature of the risk presented by the remaining wastes; 2) the adequacy of the controls intended to limit the risk to protective levels; and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility, and Volume--Department policy is to give preference to alternatives that permanently and significantly reduce the toxicity, mobility, and volume of the wastes at the site. This includes assessing the fate of the residues generated from treating the wastes at the site.

6. Implementability--The technical and administrative feasibility of implementing the alternative is evaluated. Technically, this includes the difficulties associated with the construction and operation of the alternative, the reliability of the technology, and the ability to effectively monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining special permits, rights-of-way for construction, etc.

7. Cost--Capital and operation and maintenance costs are estimated for the alternatives and compared on a present worth basis. Although cost is the last criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, lower cost can be used as the basis for final selection.

The site specific goals for remediating the site can be summarized in general as follows:

- treatment of groundwater such that, to the extent technically feasible, the concentration of contaminants is reduced to within promulgated standards;

- ensure that remedial activities do not increase the potential for the migration of contaminated groundwater by damaging the naturally occurring confining unit;

- o treat soil to prevent the recontamination of groundwater by the leaching of chemicals out of the soil mass.

The following section addresses the alternatives that have been evaluated to achieve these goals.

VI. SUMMARY OF THE EVALUATION OF THE REMEDIAL ALTERNATIVES

A. Initial Screening of the Alternatives:

The Columbia site has been evaluated as a single "operable unit." That is, the site consists essentially of a single contaminated area and the evaluations would not benefit from dividing the site into separate pieces.

The feasibility study evaluated 18 different technologies which individually or in combination with other technologies were considered for use in achieving the remedial goals. Table 6 summarizes the results of the screening of the technologies and identifies those which were excluded from a detailed analysis. The following items describe the technologies and summarize the basis for passing or excluding a technology from the detailed analysis. More complete descriptions of the technologies can be found in the RI/FS report.

Technologies/Processes that Passed Screening

Groundwater Collection:

1. Recovery Wells/Vacuum Lift--A series of recovery wells with intersecting cones of depression can be installed and used to recover contaminated groundwater. The precise number and placement of these wells is determined in the field. Additional wells are installed as needed. Groundwater can be removed from the wells by either using submersible pumps or by vacuum lift. For vacuum lift, the inlets of pipes connected to vacuum pumps are placed at the bottom of the wells. Continued vacuum pumping removes both groundwater and soil gas.

2. Recovery Trenches--The installation of subsurface drains (recovery trenches) would enhance the collection of contaminated groundwater or be used to prevent uncontaminated groundwater from entering the disposal area. This reduces the amount of additional water which must be collected and treated. Soils collected during the installation of the trenches must be properly handled and treated, if contaminated.

Discharge of Treated Groundwater:

3. Discharge to Glen Cove Creek--Once collected groundwater is treated to acceptable levels, it could be discharged to Glen Cove Creek under an appropriate discharge approval from the Department.

4. Discharge to POTW--Dependent upon approval from the local municipality, treated groundwater could be discharged into the local sanitary sewer system for additional treatment in the local Publicly Owned Treatment Works (POTW).

5. Recharge Groundwater--If a groundwater pump-and-treat system is implemented, recharging treated groundwater into the disposal area would shorten the time needed to complete the cleanup. Reinjecting treated groundwater into the treatment area would help to flush contaminants from the soils and allow a higher rate of groundwater withdrawal. Care would be needed to ensure that recharge would not enhance the potential for contaminant migration out of the disposal area.

Groundwater Treatment:

6. Carbon Adsorption--The use of activated carbon to treat contaminated groundwater is common. The contaminants present at the site are amenable to removal by this method. Adequate supplies are readily available.

7. Air Stripping--This technology is also commonly employed and found to be effective in removing volatile contaminants from groundwater. A countercurrent air stripping tower can be designed based upon existing information about the site. The results of a pilot test would be used to confirm the design and determine the need for additional water treatment or for treatment of the vapors discharged from the process.

8. UV Light Enhanced Oxidation--Although not as common as activated carbon treatment or air stripping, the treatment of groundwater by chemical oxidation enhanced by ultraviolet (UV) light, passed screening as a feasible alternative. The oxidant hydrogen peroxide is photolyzed (split by light) by ultraviolet light into hydroxyl radicals which react to degrade the contaminants.

9. Vacuum Extraction--Volatile contaminants in unsaturated soils can be removed by extracting, under vacuum, contaminant laden vapors in the pore spaces of the soil. A series of vertical extraction wells (screened pipe) are inserted into the contaminated soil and connected to pumps capable of pulling the vapors out of the soil. These vapors are then treated as described below. The technique can also be applied to contaminated soils below the water table by first lowering the water table to expose the soils and then performing the vacuum extraction.

Vapor Treatment:

10. Vapor Phase Carbon Adsorption--Contaminated vapors from the treatment of groundwater or soil can be treated by being passed through containers of activated carbon, similar to water treatment.

No Action/Monitoring:

11. Monitoring--Common to all of the remedial alternatives, including the no action alternative, a groundwater monitoring program will be implemented to evaluate the progress of the remedial alternative selected. This will consist of sampling and analyzing groundwater from the network of monitoring wells on a regular basis.

Technologies Excluded from further Analysis

Groundwater/Soil Treatment:

1. Existing Aeration Tank--Part of the current manufacturing facilities at the Konica facility includes an aeration tank. The possibility of using this tank as a treatment system for contaminated groundwater was evaluated. This was rejected due to the likely inability of the system to consistently achieve treatment standards and due to the unacceptability of linking the remedial program with production.

2. In-situ Biological Treatment--Injection of bacteria into the groundwater to reduce the concentrations of contaminants was evaluated and rejected. The technology was rejected due to the uncertainty of achieving the remedial goals and concern about the possible effects of the by-products of biodegradation.

3. Air Injection/Vapor Extraction--This technology consists of injecting air into contaminated groundwater to drive off volatile contaminants and removing the vapors using extraction wells in the unsaturated soils above the water table. The technique was rejected due to concerns about recontaminating the unsaturated soils which were replaced during the removal action in 1984.

4. Groundwater Containment--This would entail combining the installation of a low permeability cover with the natural containment characteristics of the site. The cover would reduce or eliminate the infiltration of precipitation thereby reducing the potential for contaminant migration. As a separate technology, groundwater containment is rejected because it does not achieve the remedial goals for groundwater. The technology was retained as a component of the vacuum extraction alternative since the cover would reduce the infiltration of clean vapor into the system from the surface.

Technologies Deferred from further Analysis

Vapor Treatment:

5. Catalytic Oxidation--Platinum coated oxidation units operated at 400-900°F can be used to destroy non-halogenated organic compounds. Contaminated vapors that pass through the unit are converted to carbon dioxide and water. Halogenated compounds are not effectively removed and produce acid gases in the process. Site data indicates the presence of halogenated compounds in groundwater at relatively low concentrations. Pilot test data would be needed to fully evaluate the applicability of the technology.

6. Vapor Incineration--Contaminated vapors may also be treated by high temperature (2,000° F) combustion in a vapor incineration unit. To obtain the required temperature, the fuel value of the vapors is supplemented by the injection of natural gas. As with catalytic oxidation, the presence of halogenated compounds may result in the production of acid gases.

7. Vapor Flaring--Vapor flaring is a combustion process that relies primarily upon the fuel value of the vapor to maintain a flame. At this site, the fuel value of the vapors would not likely be adequate to sustain a flare.

B. Evaluation of the Alternatives:

Remediation of the Columbia site entails addressing contaminated groundwater; soils above the water table (unsaturated); soils below the water table (saturated); treatment residuals (e.g. off-gases from air stripping); and monitoring. The feasible remedial technologies described above can be distributed into categories as follows:

A. Groundwater Collection
   1. Recovery Wells
   2. Recovery Trenches
   3. Vacuum Extraction Wells

B. Groundwater Treatment:
   1. Activated Carbon
   2. Air Stripping
   3. UV Light/Chemical Oxidation

C. Soil Treatment:
   1. Vacuum Extraction
   2. Groundwater Flushing

D. Vapor Treatment:
   1. Activated Carbon
   2. Catalytic Oxidation
   3. Incineration

Different combinations of these technologies were grouped into nine remedial alternatives and evaluated in the feasibility study. Department policy (Technical and Administrative Guidance Memorandum #4030: "Selection of Remedial Actions at Inactive Hazardous Waste Sites") provides a method of scoring the extent to which a proposed remedial alternative complies with the remedial goals stated above in Section V. Table 7 presents the results of that comparison for each of the remedial alternatives. Some of the scoring contains subjective considerations and should not be interpreted in absolute terms.

The results of the scoring show that, except for the No-Action alternative, the final scores were relatively close with Alternative VI (Dual Phase Vacuum Extraction) receiving the highest score. A closer inspection shows that Alternative VI would have received a significantly higher score than the others if the cost was not so much higher than the others.

In all cases, the evaluation of the No-Action alternative is carried through to the end of the analysis for comparison purposes. At this site, the No-Action alternative is not acceptable since soil and groundwater would remain contaminated at levels that present a significant threat to the environment. Since the cost of the No-Action alternative is so much lower than the others, the cost for the next lowest cost alternative was used as the basis for comparing the viable alternatives. This prevents a skewing of the results.

C. Selection of the Remedy:

Comparing the various remedial alternatives shows that they can be grouped into two general categories; pump-and-treat and vacuum extraction. These two categories mainly differ in their approach to treating the

remaining contaminated soil. The pump-and-treat alternatives rely upon soil flushing to remove contaminants from the soil mass whereas the vacuum extraction method removes contaminants more directly. This gives the vacuum extraction method a "technical edge" over the pump-and-treat methods in terms of a greater confidence of achieving the remedial goals. Also, it is projected that the vacuum extraction method will be much faster (1-2 years vs. 8+ years).

The obvious disadvantage of the vacuum extraction method is cost. Making conservative assumptions, it is estimated that vacuum extraction will cost approximately four times as much as the pump-and-treat methods. It is quite possible that the actual cost of the vacuum extraction method will be lower but this will not be known with any additional certainty until an extensive on-site pilot test is completed.

Therefore, the selected remedy includes the performance of a pilot test which, among other things, will allow for a better estimate of the number of extraction wells and modular treatment systems that would be needed. This, in turn, will allow a better estimate of the cost for a full scale remediation.

If the pilot test shows that the cost for vacuum extraction would be significantly higher than is estimated in the RI/FS Report, the cost factor would outweigh the confidence and time factors. It would then be appropriate to consider implementing a pump-and-treat method. Also, if the results of the pilot test provide data indicating that the pump-and-treat alternative would actually perform significantly better than predicted by the RI/FS Report, this alternative may be reconsidered for implementation.

VII. CITIZEN PARTICIPATION

To inform the local community and provide a mechanism for citizens to make the Department aware of their concerns, a citizen participation program has been implemented. In accordance with a Citizen Participation (CP) plan developed for the project, the following goals have been accomplished:

- information repositories have been established;
- documents and reports associated with the project have been placed into the repositories;
- a "contact list" of interested parties (e.g., media, public interest groups, government agencies, economic agencies, etc.) has been created;
- a fact sheet on the progress and status of the project was developed, placed in the repositories and distributed to the contact list in July 1989;
- public notice of the completion of the RI/FS and the proposed remedy was issued in Newsday and other local newspapers;
- a fact sheet summarizing the results of the RI/FS and the components of the proposed remedy were distributed to the contact list and local residents;

- o a public comment period was established and a public meeting was held on February 14, 1991 in Glen Cove to describe the proposed remedy. The transcript of the meeting is part of the Administrative Record for the project and is in the document repositories for public inspection.

A summary of the comments received during the public meeting and the public comment period are included in Exhibit D along with the Department's responses to the comments. A public notice of the selected remedy will be issued along with a brief analysis of the program.

VIII. SUMMARY OF THE GOVERNMENT'S DECISION

The selected remedial program consists of the following elements:

- o Performance of an on-site pilot program to develop data needed to refine the equipment, effectiveness, and cost estimates of a full scale dual phase vacuum extraction system (VES). If the results of the pilot program indicate (1) the actual cost of implementing the full scale system would be significantly greater than currently estimated, or (2) its effectiveness would be significantly less than currently estimated, or (3) the effectiveness of a pump-and-treat alternative would be greater and the time needed to achieve remedial objectives would be less than currently estimated, the Department will consider implementing a pump-and-treat alternative to remediate the site.

- o Performance of a soil gas survey along the northerly property boundary in the vicinity of the disposal area to confirm that contaminated soil vapor is not migrating off site.

Assuming the dual phase VES is implemented, its components include:

- o Groundwater collection using a grid of dual phase vacuum extraction wells to dewater the treatment area exposing contaminated soils. The collection of groundwater could be supplemented by the use of submersible pumps, if needed.

- o Groundwater treatment using regenerable activated carbon.

- o Discharge of treated groundwater to either the Glen Cove Creek (under State approval) or the local POTW (under local approval).

- o Soil treatment by vacuum extraction.

- o Vapor treatment using activated carbon. Alternatively, contaminant laden vapors from soils could be treated using catalytic oxidation or vapor incineration if shown to be feasible by the pilot test.

- o Groundwater monitoring to determine the effectiveness of the remedial program. Before the performance of the pilot program, all of the existing monitoring wells, and the newly installed MW-12, will be sampled and analyzed for target compound list parameters (except pesticides and PCBs) in accordance with the New York State

Analytical Services Protocols (ASP). A Report submitted by an independent data validator acceptable to the Department will evaluate the compliance of the laboratory report with the ASP.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment in that it will significantly remove contaminants from the site without creating any significant waste streams for disposal on-site or off-site. Contaminated unsaturated soils will be treated using a vacuum extraction process with treatment of the exhaust vapors to prevent unacceptable air emissions. Saturated soils will either be dewatered and treated by vacuum extraction or flushed to remove contaminants. Groundwater will be treated using regenerable activated carbon. Both media will be treated with the goal of returning site groundwater to Class GA standards. The selected remedy will minimize disturbance of the site thereby also minimizing exposures to the surrounding community.

As noted in Sections I and III above, groundwater contaminated as a result of improper disposal practices at the site is not used as a source of local water supply. Therefore, measures to prevent community exposures to contaminated groundwater and saturated soils are not needed.

Compliance with State Standards, Criteria, and Guidance

The selected remedy will comply with all applicable New York State Standards, Criteria, and Guidance (SCGs). Contaminated media at the site include soils and groundwater. New York State quality standards for groundwater are the goals for groundwater remediation. Soil cleanup objectives are based upon the goal of preventing the soils from recontaminating groundwater to levels above SCGs. SCGs for air will be met by treating emissions to levels that will prevent unacceptable ambient concentrations of volatile organic compounds.

Cost-Effectiveness

Analyses in the RI/FS report demonstrate that the selected remedy provides overall effectiveness proportional to its cost. Although other alternatives (e.g., excavation and incineration) could provide a higher degree of certainty of achieving the remedial objectives, the selected remedy presents an acceptable confidence level at significantly lower cost. This also takes into account (1) the Department's ability to identify a site owner with sufficient financial resources to design and implement the remedy, (2) the nature of the danger to human health and the environment presented by contamination at the site, and (3) the extent to which alternative methods would impose additional risks.

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

The selected remedy will provide a permanent (irreversible) solution to contamination problems at the site by treating site soils and groundwater in-situ to significantly reduce the volume of contaminants. Containment or disposal methods will not be employed. The generation of treatment

residuals (e.g., activated carbon) will be minimized to the extent practicable (e.g., by using regenerable carbon).

Preference for Treatment as a Principal Element

In-situ treatment is the primary component of the selected remedy. As discussed above, this will minimize the generation of wastes as a result of remediating the site and minimize exposures to the community.

FIGURES

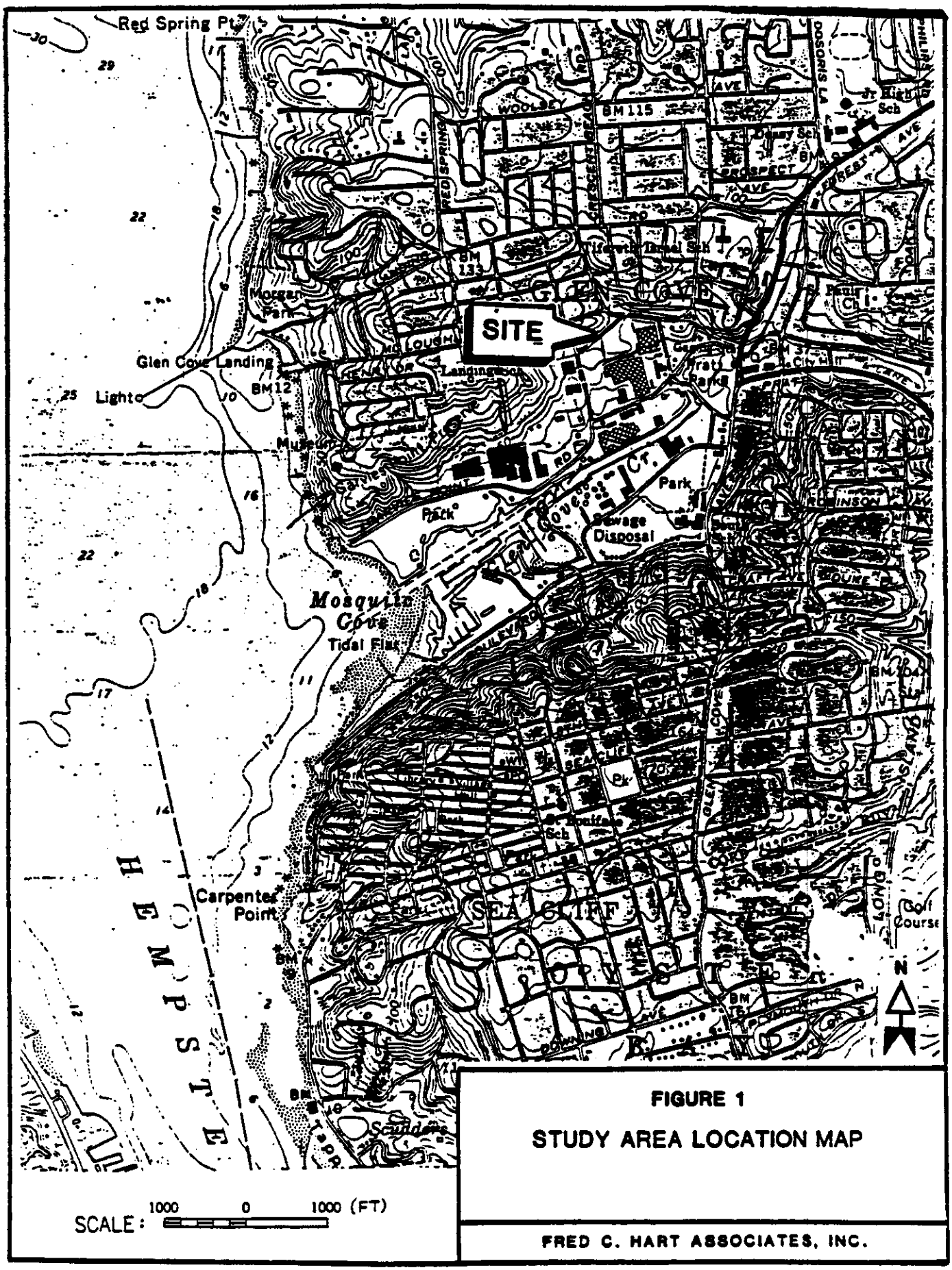

FIGURE 1

STUDY AREA LOCATION MAP

FRED C. HART ASSOCIATES, INC.

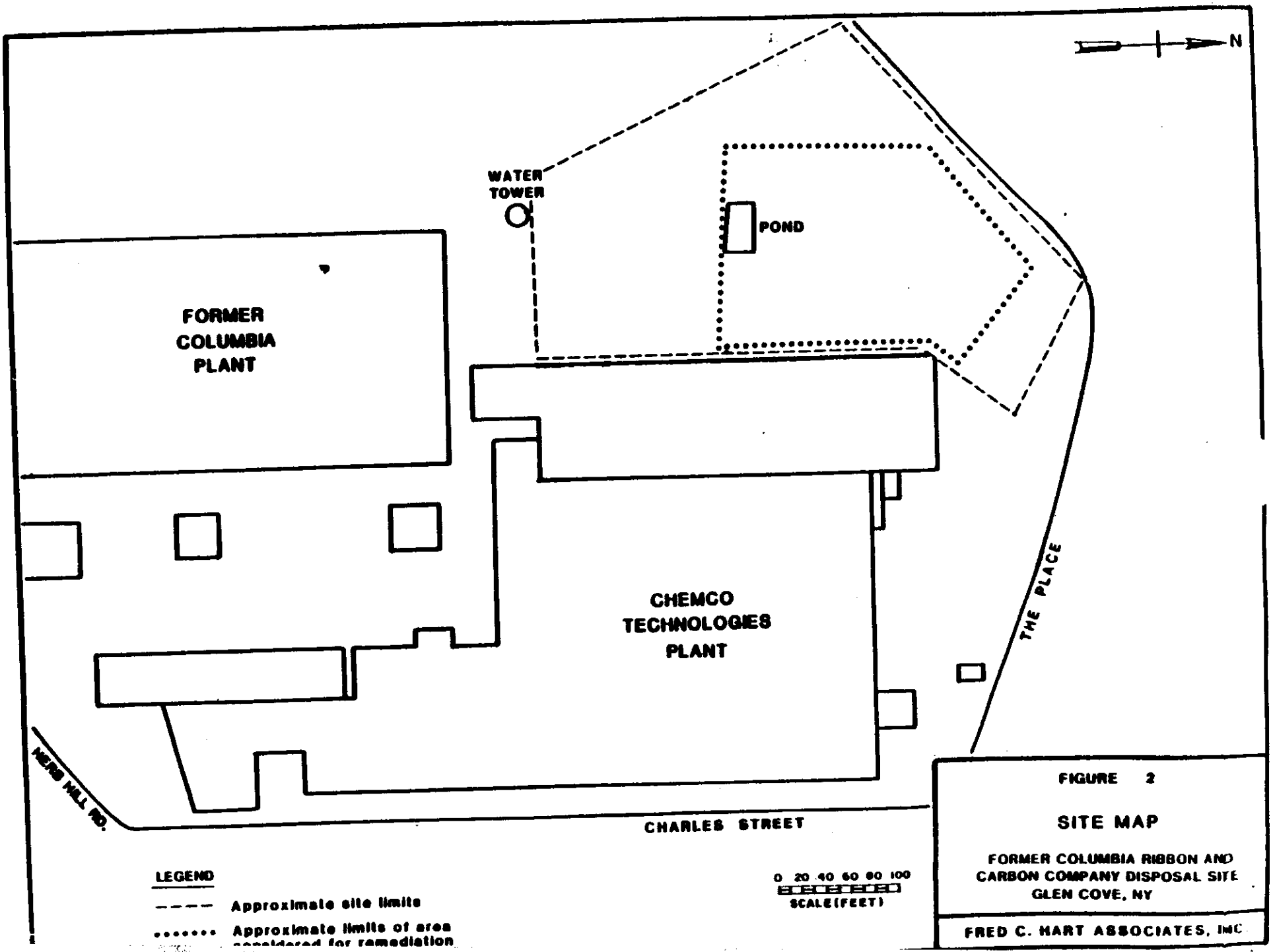

FIGURE 2

SITE MAP

FORMER COLUMBIA RIBBON AND CARBON COMPANY DISPOSAL SITE
GLEN COVE, NY

FRED C. HART ASSOCIATES, INC.

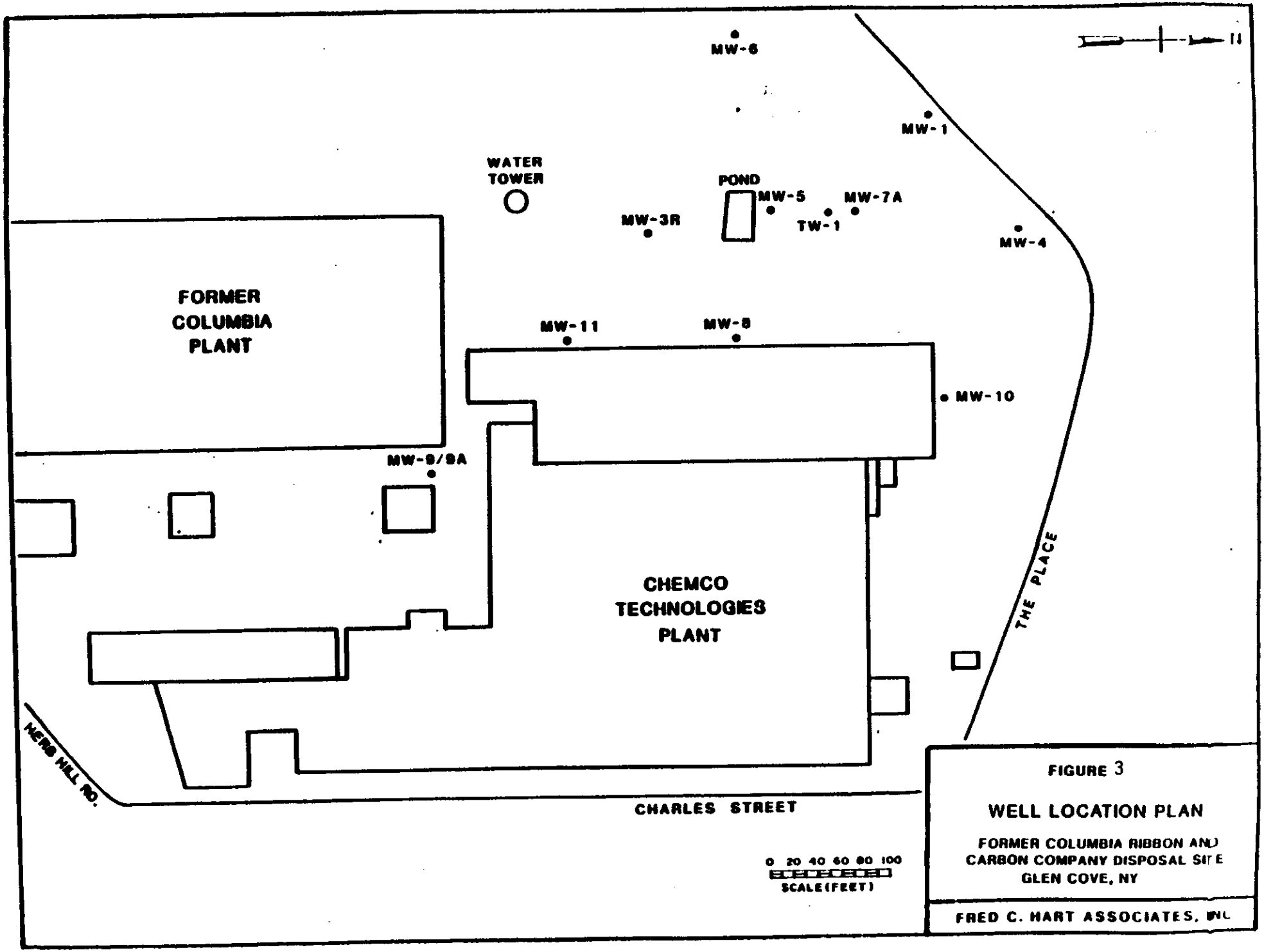

FIGURE 3

WELL LOCATION PLAN

FORMER COLUMBIA RIBBON AND CARBON COMPANY DISPOSAL SITE
GLEN COVE, NY

FRED C. HART ASSOCIATES, INC.

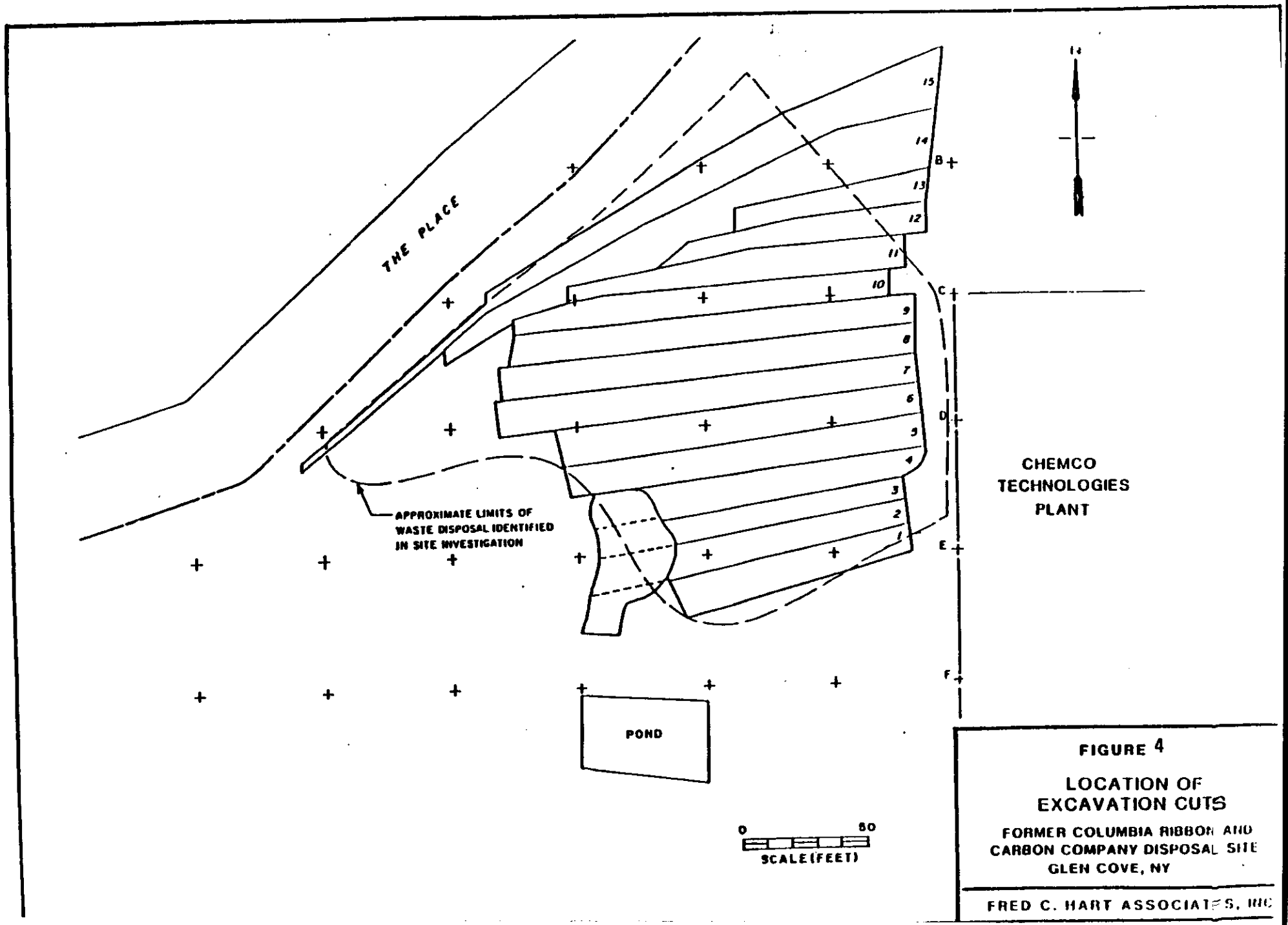

FIGURE 4

LOCATION OF EXCAVATION CUTS

FORMER COLUMBIA RIBBON AND CARBON COMPANY DISPOSAL SITE
GLEN COVE, NY

FRED C. HART ASSOCIATES, INC

TABLES

TABLE 1

ORGANIC AND INORGANIC CONSTITUENTS
DETECTED IN SOIL SAMPLES FROM TEST PITS
AT THE FORMER COLUMBIA RIBBON AND CARBON COMPANY
DISPOSAL SITE, GLEN COVE, NY
December 1983

Volatile Organic Priority Pollutants[1]	Concentration Range (ug/kg)
Chloroform	<10 - 199
Toluene	<10 - 2,150
Trichloroethene	ND[2] - 14
Ethylbenzene	ND - 6,364
Tetrachloroethene	ND - 950
Benzene	ND - 758
Methylene Chloride	ND - <100
Acrolein	ND - <100
1,1,1-Trichloroethane	ND - 5,269
1,1-Dichloroethane	ND - 852
Trans.-1,2-Dichloroethene	ND - 296
p,m,o-Xylenes[3]	ND - 22,005
Inorganics (Total)	
Arsenic	663 - 6,763
Beryllium	ND - 510
Cadmium	210 - 385
Chromium	683 - 22,320
Copper	5,710 - 13,490
Lead	ND - 4,030
Mercury	50 - 154
Nickel	996 - 7,010
Zinc	11,150 - 30,310
pH	4.91 - 7.09

NOTES:

1. Additional non-priority pollutant volatile organics were identified through an analytical library search. Approximately 26 volatile organic compounds were identified with concentrations ranging from ND to > 4000 ug/kg. Quantification beyond this range was not possible. The specific organics which were identified are summarized in the April 1984 report.

2. ND is non-detect.

3. Although p,m,o-Xylenes are not priority pollutants it is incorporated into this table for comparison with the benzene and toluene levels.

(2819n-10)

TABLE 2

SUMMARY OF ORGANIC AND INORGANIC CONSTITUENTS
DETECTED IN GROUNDWATER SAMPLES FROM MONITORING WELLS
AT THE
FORMER COLUMBIA RIBBON AND CARBON COMPANY DISPOSAL SITE
GLEN COVE, NEW YORK

FEBRUARY 1984

Parameters (ug/l) [1]	MW-1	MW-4	MW-5	MW-6
Acrylonitrile	ND[2]	ND	<100	ND
Benzene	ND	22	65	ND
Chlorobenzene	<10	<10	<10	ND
Chloroform	<10	ND	<10	ND
1,2-Dichloroethane	ND	ND	24	ND
Toluene	ND	118,000	90,000	ND
Trichloroethene	ND	ND	18	ND
1,1-Dichloroethane	<10	17	ND	ND
Trans-1,2-Dichloroethene	ND	<10	ND	ND
Ethylbenzene	ND	303	412	ND
Tetrachloroethene	ND	ND	<10	ND
p,m,o-Xylene	<10	732	1,745	ND
1-ethyl-2 methyl benzene	ND	52	23	ND
1,2,3-Trimethylbenzene	ND	114	44	ND
1,3,5-Trimethylbenzene	ND	53	30	ND
5,-Hydroxy-4-methyl-6-hepten-3-one	-	-	-	Present
2-ethyl-1-hexanol	-	-	Present	Present
Di-octyl-phthalate	ND	<10	12	ND
Napthalene	ND	54	23	ND
Dibutyl phthalate	ND	ND	<10	ND
2,4-Dimethyl phenol	ND	ND	<25	ND
Phenol	ND	ND	53	ND
Bis(2-ethylhexyl)phthalate	ND	ND	ND	462

(2819n-13)

TABLE 2
(CONTINUED)

SUMMARY OF ORGANIC AND INORGANIC CONSTITUENTS
DETECTED IN GROUNDWATER SAMPLES FROM MONITORING WELS
AT THE
FORMER COLUMBIA RIBBON AND CARBON COMPANY DISPOSAL SITE
GLEN COVE, NEW YORK

FEBRUARY 1984

Parameters (mg/l) [3]	MW-1	MW-4	MW-5	MW-6
Antimony	<0.1	<0.1	<0.1	<0.1
Arsenic	0.005	0.009	0.034	0.004
Beryllium	<0.003	<0.003	<0.003	<0.003
Cadmium	<0.003	<0.003	<0.003	<0.003
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	0.079	0.051	<0.010	<0.010
Lead	0.048	<0.025	<0.025	<0.025
Mercury	0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.041	<0.020	<0.020	<0.020
Silver	<0.001	<0.001	<0.001	<0.001
Selenium	<0.006	<0.006	<0.006	<0.006
Thallium	<0.050	<0.050	<0.050	<0.050
Zinc	0.170	0.060	0.061	0.010
Cyanide	<0.020	<0.020	<0.020	<0.020
Total Phenols	0.012	0.133	0.000567	<0.005

NOTES:

1. < for organics indicates the compounds were present but below the method detection limit.
2. ND is Non-Detect.
3. < for inorganics indicates the parameter was below the method detection limit.

TABLE 3

SUMMARY OF VOCs DETECTED IN GROUNDWATER
SAMPLES FROM MONITORING WELLS
AT THE
FORMER COLUMBIA RIBBON AND CARBON COMPANY DISPOSAL SITE

JUNE 1986

Parameter (ug/l)	MW-1	MW-4	MW-5	MW-6	MW-7A	MW-8	MW-9	MW-9A	MW-10	MW-11
Toluene	ND[1]	70,000	83,000	230	ND[2]	ND	20	ND	20	20
Total Xylenes (p, m, o)	ND	ND	ND	ND	ND	ND	30	ND	ND	40
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	30	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	30	ND	ND
Cis/Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	30	ND	ND
1,1-Dichloroethane	120	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTES:

1 - ND indicates non-detect
2 - Original analysis indicated a concentration of 120 ug/l. A resampling indicated ND for this parameter.

TABLE 4

POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
FOR GROUNDWATER
FORMER COLUMBIA RIBBON AND CARBON COMPANY DISPOSAL SITE
GLEN COVE, NEW YORK
(Concentrations in ug/l except where noted)

Parameter	Concentration Range[1]	NYS Class GA Standard[2]	NYS Sanitary Code[3] Subpart 5-1	Federal SDWA MCL[4] [6]	RfD mg/kg/day[7]	Drinking Water Concentration Based on RfD
Benzene	ND-471	ND[4]	5	5(F)	-	-
Chloroethane	ND-34	NA[5]	5	NA	NA	-
1,1-dichloroethane	ND-120	NA	5	NA	0.1(b)	3,500
1,2-dichloroethane	ND-24	NA	5	5(F)	-	-
1,1-dichloroethene	ND-2	NA	5	7(F)	-	315
1,2-dichloroethene (Cis/trans)	ND-30	NA	5	70(Cis)(P)	0.020(b)	700
				100(trans)(P)	-	-
Ethylbenzene	ND-503	NA	5	700(P)	0.1(b)	3,500
Tetrachloroethene	ND-30	NA	5	5(P)	0.01(b)	350
Toluene	ND-118,000	NA	5	2,000(P)	0.30(a)	10,500
Trichloroethene	ND-30	10	5	5(F)	-	-
Xylenes	ND-2,510	NA	5 (M+P+O[8])	10,000(P)	2.00	70,000
Phenol	ND-133	1	NA	NA	0.60(a)	21,000
Arsenic	5-34	25	50	50(F)	-	-
Lead	ND-48	25	50	50(F)[9]	-	-

Notes:

1 - Range of concentrations of various parameters from monitoring data over three samplings except for phenol, arsenic and lead
2 - New York State standards for Class GA groundwaters
3 - New York State Sanitary Code Subpart 5-1, Public Water Supplies.
4 - ND is non-detected, applicable value of 2 to 5 ug/l as reasonable detection limit.
5 - NA - Not available or not applicable.
6 - F=Final; P=Proposed; from 54 Fed. Reg. 22061, May 22, 1989. (Safe Drinking Water Act)
7 - Reference Dose calculations based on:
(a) IRIS Database
(b) EPA Health Effects Assessment Summary Tables, Fourth Quarter, FY 1989.
8 - A concentration of 5 ppb is applied to each isomer of xylene
9 - Although the SDWA standard for lead is currently 50 ug/l, there is a proposed standard of 20 ug/l currently under review.
NA - Not Available

TABLE 5

SUMMARY OF ANALYTICAL RESULTS OF GROUNDWATER SAMPLES
FORMER COLUMBIA RIBBON AND CARBON COMPANY
DISPOSAL SITE
GLEN COVE, NEW YORK
MAY 1988

Parameter	Before Pumping	After Pumping
Purgeable Halocarbons (ug/l):		
Chloroethane	<40	34
Trichlorofluoromethane	<1	3
1,1 Dichloroethene	2	2
1,1 Dichloroethane	87	60
Trans 1,2 Dichloroethene	6	9
1,2 Dichloroethane	3	3
Trichloroethylene	3	2
Purgeable Aromatics (ug/l):		
Benzene	229	471
Toluene	40,600	62,800
Ethylbenzene	238	503
Xylenes	1,940	2,510

TABLE 6

RESULTS OF REMEDIAL ACTION TECHNOLOGY SCREENING

Technology	Screening Result
Groundwater Extraction	
- Recovery Wells	Passed
- Subsurface Lateral Drains (Recovery Trenches)	Passed
Discharge Options	
- Discharge to Glen Cove Creek	Passed
- Discharge to POTW	Passed
- Recharge Groundwater	Passed
On-site Groundwater Treatment	
- Carbon Adsorption	Passed
- Air Stripping	Passed
- Existing Aeration Tank	Excluded
- Ultraviolet Light Chemical Oxidation	Passed
In-situ Biological Treatment	Excluded
Air Injection/Vapor Extraction	Excluded
Vacuum Extraction (Unsaturated and Saturated Soils)	Passed
Groundwater Containment	Excluded
Monitoring	Passed
Vapor Emission Abatement	
- Vapor Phase Carbon Adsorption	Passed
- Catalytic Conversion	Excluded
- Vapor Incineration	Excluded
- Vapor Flaring	Excluded

Table 7
Comparison of Remedial Alternatives
Relative Scores

Criteria	Alternative I	II	IIA	III	IIIA	IV	IVA	VI
Compliance w/SCGs(10)	6	8	9	8	9	8	9	10
Protection of Human Health/Environment(20)	6	13	16	13	16	13	16	20
Short-term Impacts and Effectiveness(10)	9	8	7	8	7	8	7	9
Long-term Effectiveness and Permanence(15)	6	11	12	11	12	11	12	15
Reduction of Toxicity, Mobility, & Volume(15)	7	13	14	13	14	13	14	15
Implementability(15)	14	13	12	13	12	13	12	14
Cost(15)	15*	12	9	15	10	8	7	2
Total Score(100)	63	78	79	81	80	74	77	85

Definitions of Alternatives and Present Worth of Total Costs

	Groundwater Collection	Groundwater Treatment	Soil Treatment	Vapor Treatment	Present Worth of Total Cost
I(1)	NA	NA	NA	NA	$146,111
II	Recovery Wells	Activated Carbon	Flushing	NA	724,820
IIA	Recovery Trenches	Activated Carbon	Flushing	NA	1,001,130
III	Recovery Wells	Air Stripping	Flushing	Act. Carbon(3)	600,240(4)
IIIA	Recovery Trenches	Air Stripping	Flushing	Act. Carbon(3)	888,500(4)
IV	Recovery Wells	UV/Oxidation	Flushing	NA	1,132,560
IVA	Recovery Trenches	UV/Oxidation	Flushing	NA	1,321,160
V(2)	NA	NA	Vac. Extract.	Act. Carbon(3)	248,670
VI	Vacuum Lift	Activated Carbon	Vac. Extract.	Act. Carbon	3,911,060

(1) No Action with monitoring is a component of all other alternatives.
(2) Unsaturated soil vacuum extraction is a component of alternatives I-IVA.
(3) If emissions exceed action levels.
(4) Assumes vapor treatment not needed.
* Alternative I cost not used as basis for comparison, see text.

EXHIBITS

EXHIBIT A
ADMINISTRATIVE RECORD
COLUMBIA RIBBON AND CARBON MANUFACTURING COMPANY SITE
AKA POWERS CHEMCO SITE (#130028)

A. "Remedial Investigation and Feasibility Study: Former Columbia Ribbon and Carbon Company Disposal Site; Glen Cove, New York," prepared by Fred C. Hart Associates, Inc.; February 1991.

B. "Response to NYSDEC comments on the Former Columbia Ribbon Company Waste Disposal Site RI/FS," prepared by Fred C. Hart Associates, Inc.; September 14, 1989.

C. "Remedial Investigation/Feasibility Study work plan for the Former Columbia Ribbon and Carbon Waste Disposal Site," prepared by Fred C. Hart Associates, Inc.; August 1987

D. "Supplemental Hydrogeologic Investigation of the former Columbia Ribbon and Carbon Company Waste Disposal Site," prepared by Fred C. Hart Associates, Inc.; October 1986.

E. "As-Built: Initial Remedial Action: Former Columbia Carbon and Ribbon Site," drawing date January 30, 1985, prepared by Fred C. Hart Associates; attached to letter from David R. Case, Esq. to Michael J. Tone, Esq., dated February 7, 1985.

F. "Former Columbia Site Initial Remedial Program--Description of Excavation," prepared by Fred C. Hart Associates, Inc., dated December 21, 1984; attached to letter from David R. Case, Esq. to Michael J. Tone, Esq., dated December 21, 1984.

G. "Engineer's Certification Report: Removal of Drums and Contaminated Soils from the Former Columbia Ribbon and Carbon Co. Site; Glen Cove, NY," prepared by Fred C. Hart Associates, Inc.; September 1984.

H. "Investigation and Hydrogeologic Assessment of the Former Columbia Ribbon and Carbon Company Waste Disposal Site," prepared by Fred C. Hart Associates, Inc.; April 1984.

I. "Responsiveness Summary; Columbia Ribbon and Carbon Manufacturing Company Site; AKA Powers Chemco Site (ID No. 130028); Glen Cove, Nassau County, New York," prepared by the NYS Department of Environmental Conservation, as Exhibit D of the Record of Decision, dated March 1991.

J. "Citizen Participation Plan--Columbia Ribbon and Carbon Manufacturing Site--A.K.A. Powers Chemco Site," prepared by the New York State Department of Environmental Conservation, January 1991.

K. Public Notice, Meeting Announcement, and Fact Sheet for the February 14, 1991 public meeting.

L. Transcript of Public Meeting, Glen Cove City Hall, February 14, 1991.

M. Order on Consent, "In the matter of a Remedial Investigation/ Feasibility Study of an Inactive Hazardous Waste Disposal Site caused by the Disposal of Hazardous and Industrial Wastes by Columbia Ribbon and Carbon Manufacturing Company, to be conducted by Powers Chemco, Inc.," Index #T0188, between Powers Chemco, Inc. and the New York State Department of Environmental Conservation, dated April 4, 1988.

N. Order on Consent, "In the matter of an Alleged Significant Threat to the Environment Caused by the Disposal of Hazardous and Industrial Wastes by Columbia Ribbon and Carbon Manufacturing Company and a Supplemental Hydrogeologic Investigation to be conducted by Powers Chemco, Inc.," Index #T071585 between Powers Chemco, Inc. and the New York State Department of Environmental Conservation, dated January 16, 1986.

O. Order on Consent, "In the matter of an Alleged Significant Threat to the Environment Caused by the Disposal of Hazardous and Industrial Wastes by Columbia Ribbon and Carbon Manufacturing Company and an Interim Remedial Program to be conducted by Powers Chemco, Inc.," Index #T060684, between Powers Chemco, Inc. and the New York State Department of Environmental Conservation, dated June 8, 1984.

P. "*Proposed Remedial Action Plan; Columbia Ribbon and Carbon* Manufacturing Company Site; Also Known As the Powers Chemco Site; Nassau County, New York; ID Number 130028," prepared by the New York State Department of Environmental Conservation; Division of Hazardous Waste Remediation, dated February 1991.

EXHIBIT B
PROJECT CHRONOLOGY
COLUMBIA RIBBON AND CARBON MANUFACTURING SITE
A.K.A. POWERS CHEMCO SITE (#130028)

1979	Powers Chemco purchases parking lot from Columbia. Columbia becomes bankrupt (date uncertain).
1983	Powers Chemco discovers subsurface contamination.
11/30/83	First field investigation begins.
4/84	Report: "Investigation and Hydrogeologic Assessment of the Former Columbia Ribbon and Carbon Company Waste Disposal Site."
6/8/84	First Order on Consent; for removal action.
9/28/84	Report: "Engineers Certification Report: Removal of Drums and Contaminated Soils from the Former Columbia Ribbon and Carbon Co. Site."
1/16/86	Second Order on Consent; for second field investigation.
11/86	Report: "Supplemental Hydrogeologic Investigation of the Former Columbia Ribbon and Carbon Company Waste Disposal Site."
4/4/88	Third Order on Consent; for Remedial Investigation/Feasibility Study (RI/FS),
9/88	Submittal of first draft of RI/FS Report.
5/30/89	Department disapproves first draft of RI/FS Report.
3/5/90	Submittal of second draft of RI/FS Report.
5/9/90	Department disapproves second draft of RI/FS Report.
2/1/91	Submittal of third draft of RI/FS Report.
2/1/91	Public notice of availability of draft final RI/FS Reports and public meeting to discuss proposed remedy.
2/14/91	Public meeting - Glen Cove City Hall - February 14, 1991.
3/7/91	Close of public comment period.

EXHIBIT C

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

CLASSIFICATION CODE: 2 REGION: 1 SITE CODE: 130028
EPA ID:

NAME OF SITE : Powers Chemco
STREET ADDRESS: Charles Street

TOWN/CITY:	COUNTY:	ZIP:
Glen Cove	Nassau	11542

SITE TYPE: Open Dump-X Structure- Lagoon- Landfill- Treatment Pond-
ESTIMATED SIZE: 2 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Powers Chemco
CURRENT OWNER ADDRESS.: Charles St., Glen Cove, NY
OWNER(S) DURING USE...: Columbia Ribbon& Carbon Mfg. Co.
OPERATOR DURING USE...: Columbia Ribbon
OPERATOR ADDRESS.....: ,
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From Unkn. (50s To 1979

SITE DESCRIPTION:
Property adjacent to plant purchased for use as a parking lot. The previous owner (Columbia Ribbon) had contaminated areas with inks and solvents (toluene). Powers Chemco voluntarily submitted plans for clean up to DEC. Consent Order signed. Drums and soil were removed in 1984.
RI/FS is underway by PRP.

HAZARDOUS WASTE DISPOSED: TYPE	Confirmed-X	Suspected- QUANTITY (units)
Inks		minimum of 100
solvents (toluene)		drums (50 crushed)
ethylbenzene		
ethylacetate		

SITE CODE: 130028

ANALYTICAL DATA AVAILABLE:
Air- Surface Water- Groundwater-X Soil-X Sediment-

CONTRAVENTION OF STANDARDS:
Groundwater-X Drinking Water-X Surface Water- Air-

LEGAL ACTION:

TYPE..: Consent Order State- X Federal-
STATUS: Negotiation in Progress- Order Signed- X

REMEDIAL ACTION:

Proposed- Under design- In Progress-X Completed-
NATURE OF ACTION: RI-FS underway.

GEOTECHNICAL INFORMATION:
SOIL TYPE: sand & gravel with possible clay lenses
GROUNDWATER DEPTH: 3 - 10 feet

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Soil and groundwater contamination confirmed. The majority of the contamination is limited to the original disposal area.

ASSESSMENT OF HEALTH PROBLEMS:

Volatile organic contamination of the on-site shallow aquifer has been documented with downgradient monitoring wells exhibiting levels of contaminants which exceed groundwater standards. No contaminants have been detected in public water supply wells one half mile from the site. There are 20 homes along Place Street, 40 meters north of the site, which could potentially be affected by vapors and/or basement seepage. Although the homes are considered upgradient of the site, the northern most monitoring well (MW-4) exhibited 70 ppm toluene. Groundwater/gas seepage into Powers' lower building is possible. Glen Cove Creek, a possible recipient of contaminated groundwater and surface runoff, is about 300 meters from the site. Supplemental investigation is necessary to address these issues. The remedial alternative will contain the contaminated groundwater by pumping and treat the water by packed tower aeration.

EXHIBIT D
RESPONSIVENESS SUMMARY
COLUMBIA RIBBON AND CARBON MANUFACTURING COMPANY SITE
AKA POWERS CHEMCO SITE (ID NO. 130028)
GLEN COVE, NASSAU COUNTY, NEW YORK

I. Public Meeting Comments:

The following comments were made during the public meeting held in the Glen Cove City Hall on February 14, 1991 beginning at 7:30 PM. The transcript of the meeting is part of the administrative record for the project.

Issue #1: Are there any off-site impacts resulting from the contamination of this site?

Response: The results of the investigations at the site indicate no significant off-site impacts. Fortuitously, the subsurface conditions of the disposal area greatly limit the mobility of the contaminants remaining in the saturated soil and groundwater. Groundwater moves to the south towards Glen Cove Creek whereas residences are to the north. Downgradient groundwater monitoring wells show the presence of halogenated organic compounds in the 20-40 part per billion (ppb) range. These chemicals are not detected in wells in or closer to the disposal area. This may indicate an off-site or regional source of these chemicals. As part of the remedial program, an additional, upgradient monitoring well will be installed to further investigate this possibility. Other investigative techniques (e.g., soil vapor survey, geophysical surveys, test pits, excavations) have also indicated that there are no complete exposure pathways. An additional soil vapor survey between the disposal area and the residences to the north will be performed before the remedial program is begun to determine if conditions have changed since the completion of the previous studies.

Although it is possible that contaminants may be migrating out of the disposal area undetected, the stability of the concentrations indicate that this could not be occurring to a significant degree. Otherwise, the concentrations in the disposal area would noticeably decline over time.

Item #2: What is the source of the funding for the remedial program?

Response: Konica Imaging U.S.A., Inc., the current owners of the contaminated parcel, have indicated their willingness to fund the remedial program. Negotiations are beginning between Konica and the NYSDEC to formalize this agreement in a voluntary order on consent. State and local agencies incurred costs performing oversight of the project.

Issue #3: Contaminated vapors generated as a result of the remedial program at the site should be treated to minimize, to the extent possible, their emission into the air. Local air quality is already impaired by a number of sources in the area.

Response: For each contaminant that may be emitted to the air as a result of the remedial program, maximum allowable emission rates will be established. This process will take into account existing local conditions, proximity to receptors, estimated duration of the remedial program, ambient standards, limitations of available air pollution control equipment, toxicological information, and estimates of the relationship between emission rates and ambient concentrations. The final selection of the air pollution control equipment to be used will be based upon this analysis. A monitoring program will be developed and implemented to ensure that the equipment is operating satisfactorily. This will consist of a combination of real-time monitoring using survey instruments and discrete sampling followed by laboratory analysis to obtain chemical specific emission data.

Issue #4: Why isn't the Columbia Ribbon and Carbon Manufacturing Company contributing financially to the remedial program?

Response: Columbia became bankrupt and is insolvent.

II. **Letters Received:**

1. From Mayor Donald P. DeRiggi, Mayor of the City of Glen Cove, dated March 1, 1991.

Issue: An environmental monitor should be assigned during the remediation of the site.

Response: The NYSDEC will assign staff (engineer/geologist) to oversee the design, construction and operation of the remedial program. On-site presence by the NYSDEC will be commensurate with the activities at the site. Oversight will be extensive during construction and start-up. When it has been demonstrated that the system is operating properly, site visits will be made periodically to monitor operations.

2. From Roy M. Speiser, D.C., Co-Chairman of the Glen Cove Environmental Advisory Council, dated March 4, 1991.

Issue: Air emissions from the remedial program should be kept to an absolute minimum. Also, the program should be monitored by an independent third party funded by Konica to assure the residents of Glen Cove that negative health impacts will be minimized.

Response: The issues of minimizing air emissions and monitoring the remedial program are addressed above. The Department cannot justify requiring that Konica fund a third party monitor for the following reasons: (1) the monitor would be redundant; (2) the presence of a third party monitor would not necessarily provide the assurances sought; and (3) measures to minimize impacts will be built into the system.