Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Tishcon @ Brooklyn Avenue Site
Town of North Hempstead, Nassau County
Site Number 1-30-043 E
Operable Unit No. 02 - Off-Site Groundwater

March 2000

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

DECLARATION STATEMENT - RECORD OF DECISION

Tishcon @ Brooklyn Avenue Inactive Hazardous Waste Disposal Site
Town of North Hempstead, Nassau County, New York
Site No. 1-30-043 E
Operable Unit No. 02 - Off-Site Groundwater

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Tishcon @ Brooklyn Avenue class 2 inactive hazardous waste disposal site for Operable Unit 02 - Off-Site Groundwater and was chosen in accordance with the New York State Environmental Conservation Law. The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Tishcon @ Brooklyn Avenue inactive hazardous waste site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

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

Description of Selected Remedy

Based upon the results of the Focused Remedial Investigation/Feasibility Study for the Tishcon @ Brooklyn Avenue site and the criteria identified for evaluation of alternatives the NYSDEC has selected Air Sparging/Soil Vapor Extraction to remediate off-site groundwater contamination. The components of the remedy are as follows:

- *A remedial design, including pilot tests, to verify the components of the conceptual design and provide the details necessary for the construction, operation, and monitoring of the remedial program.*

- *Installation of injection wells to introduce air into the groundwater to promote volatilization of the VOC contamination.*

- *Installation of extraction wells to capture contaminants volatilized from the groundwater.*

- *Installation of granular activated carbon (GAC) filters to treat volatilized contaminants prior to release to the atmosphere.*

- *Semiannual sampling of six (6) existing and six (6) newly installed monitoring wells (two (2) clusters of three (3) monitoring wells) to monitor the effectiveness of the system. The monitoring data will be reviewed annually to determine if the system has reached its objectives and can be deactivated.*

- *Off-site (down-gradient) groundwater contamination will be addressed as a part of the overall investigation of the groundwater contamination that is migrating from all Class 2 sites in the NCIA.*

New York State Department of Health Acceptance

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

Declaration

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

3/27/2000
Date

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

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RECORD OF DECISION

Tishcon @ Brooklyn Avenue Site
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SECTION 1: SUMMARY AND PURPOSE OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) has selected a remedy to address the significant threat to human health and/or the environment created by the presence of hazardous waste at the Tishcon Corporation @ Brooklyn Avenue, Inactive Hazardous Waste Disposal Site (Tishcon). Disposal to an on-site dry well and other drainage structures has resulted in the release of hazardous wastes, including 1,1,1-trichloroethane (1,1,1-TCA), at the site. The site has been investigated to find these and other source areas of contamination. Tishcon had removed the source areas (soils) of contamination in previous remedial actions. The January 1998 Record of Decision for the Tishcon site, Operable Unit 01 (source removal), describes this work. This Record of Decision (ROD) addresses the investigation and remediation of off-site groundwater contamination. On-site and down-gradient groundwater is contaminated with volatile organic compounds (VOCs). 1,1,1-TCA is the primary VOC present at the site with concentrations as high as 22,000 ppb, which exceeds the groundwater standard of 5 ppb.

Disposal activities at the site have resulted in the following significant threat to the public health and the environment:

- *A significant threat to human health and the environment associated with this site's contravention of groundwater standards in a sole source aquifer.*

Currently, there are thirteen (13) Class 2 sites in the New Cassel Industrial Area (NCIA). A Class 2 site is a site at which hazardous waste constitutes a significant threat to the environment or the public health and action is required. The Department has been using a three-prong strategy in remediating Class 2 sites in the NCIA. The first action identifies source areas at each site which will be remediated or removed; the second action includes the investigation and proper remediation of groundwater contamination at and beneath each site; and the third action is the ongoing effort by the Department to investigate groundwater contamination that is migrating off-site from all Class 2 sites within the NCIA. Upon completion of this comprehensive groundwater investigation, the Department will propose a remedy to the public. After public review, a final groundwater remedy will be selected. This off-site groundwater remedy will be a component of the comprehensive NCIA groundwater remediation system.

The contaminated groundwater at the Tishcon site and within the entire NCIA presents a potential route of exposure to humans. While public water serves the area, the underlying aquifer

is the source of the water supply for the Bowling Green Water District customers. An air stripping treatment system was constructed in 1996 to supplement the carbon filtration system and to mitigate the impact of the groundwater contamination on the Bowling Green water supply wells. The Bowling Green water supply wells are routinely monitored for compliance with drinking water standards. Early warning monitoring wells have been installed south of Old Country Road, in locations down-gradient of the NCIA inactive hazardous waste disposal sites and up-gradient of the water supply wells as a precautionary measure. Therefore, use of the groundwater in the area is not currently considered an exposure pathway of concern.

As part of the remediation strategy for this site, an AS/SVE system to address on-site soil and groundwater contamination was required by the January 1998 ROD. This system is in place and is expected to remain in operation until it effectively remediates the on-site soil and groundwater.

In order to eliminate or mitigate the significant threats to the public health and/or the environment that the hazardous waste disposed at the Tishcon Corporation @ Brooklyn Avenue site has caused, the following remedy was selected:

- *An air sparging/soil vapor extraction system (AS/SVE) to address volatile organic contamination (VOC) in the off-site groundwater.*

The elements of the selected remedy will include:

- *A remedial design, including pilot tests, to verify the components of the conceptual design and provide the details necessary for the construction, operation, and monitoring of the remedial program. Any uncertainties identified during the RI/FS would be resolved.*

- *Installation of injection wells to introduce air into the groundwater promoting volatilization of the VOC contamination.*

- *Installation of extraction wells to capture contaminants volatilized from the groundwater.*

- *Installation of activated carbon filters for treatment of volatilized contaminants prior to release to the atmosphere.*

- *Semiannual sampling of six (6) existing and six (6) newly installed groundwater monitoring wells (two clusters of three monitoring wells) to monitor the effectiveness of the system. The monitoring data will be reviewed annually to determine if the system has reached its objectives and could be deactivated.*

SECTION 2: SITE LOCATION AND DESCRIPTION

The Tishcon site is located west of the intersection of Old Country Road and the Wantagh State Parkway in the New Cassel Industrial Area (NCIA) which is an approximately 170 acre industrial and commercial area in the Town of North Hempstead, Nassau County. Currently there are thirteen (13) Class 2 sites within the NCIA. See Figures 1, 2 and 2a.

A single structure owned by Tishcon almost entirely occupies the 1.5 acre site. Tishcon manufactures vitamins, dietary supplements, soft gelatin capsules, and related items in this facility. Tishcon has owned and operated their manufacturing operations at this facility since 1982. Tishcon used 1,1,1-TCA in their production process.

The NCIA is highly developed and no significant surface water sources exist near the Tishcon site. The nearest surface waters are small ponds within the Eisenhower Memorial Park, approximately two miles to the southwest.

The on-site soil and groundwater contamination was addressed as Operable Unit No. 01 (OU 1) (See January 1998 ROD). The off-site groundwater associated with this site has been designated as Operable Unit No. 02 (OU 2).

An Operable Unit represents a discrete portion of the remedy for a site that, for technical or administrative reasons, can be addressed separately to eliminate or mitigate a release, a threat of release or exposure pathway resulting from the site contamination.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

Tishcon has operated their facility at this site since 1982. As part of their gelatin capsule manufacturing process, Tishcon used 1,1,1-TCA as a rinse to remove mineral oil from the gelatin capsules. Tishcon purchased 16,665, 16,755, 17,143, and 22,016 gallons of 1,1,1- TCA in 1992, 1993, 1994, and 1995, respectively.

In May 1997, Tishcon phased out the use of 1,1,1-TCA and incorporated a closed-loop, petroleum-based process into their manufacturing. This process reuses the wash in a closed system and has no vapor discharge to the atmosphere.

The facility and on-site structures were originally built in 1960. Plans on file at the Town of North Hempstead Building Department show that the original design included two on-site cesspools for waste water disposal on the New York Avenue side of the facility. These cesspools were abandoned when the building was connected to the municipal sewer line below New York Avenue in 1980, before Tishcon's occupancy.

An outdoor floor drain at the center of the site and a sealed storm drain located on the Brooklyn Avenue side of the facility have reportedly received waste materials (See Figure 3).

The cesspool on the Brooklyn Avenue side of the facility was originally connected to a bathroom. This cesspool is identified as the out-of-service cesspool on Figure 3. Tishcon converted the bathroom into a wash room, for the cleaning of industrial equipment, with a floor drain that connected to the cesspool. When Tishcon discovered that the floor drain discharged to the cesspool (July 1994), they ceased use of the drain. Tishcon connected the floor drain to the Nassau County Sewer line below Brooklyn Avenue on November 9, 1995.

3.2: Remedial History

In 1988, the entire New Cassel Industrial Area was listed on the New York State Registry of Inactive Hazardous Waste Disposal Sites (the Registry) as a Class 2 site due to the presence of volatile organic compounds (VOCs) in the groundwater. The Class 2 designation indicates that the site poses a significant threat to the public health or the environment and requires action.

In February 1995, Lawler, Matusky, and Skelly Engineers (LMS) completed a site investigation report for the NCIA under the New York State Superfund program. Based on this report, in March 1995, the Department removed the NCIA from the Registry. Concurrently, the Tishcon site and four other sites were added to the Registry as individual Class 2 sites. The Site Investigation Report is available for review at the document repositories.

The Department initially included the property at 29 New York Avenue as part of this site. The 29 New York Avenue property has since been designated as a separate Class 2 site on the Registry (Site No. 1-30-043V).

Tishcon Corporation, the Potential Responsible Party (PRP), addressed Operable Unit No. 01 - Source Removal (Soils) with previous investigations. Also, an on-site remedial action is ongoing which will treat on-site soil and groundwater contamination. The following is a summary of the previous investigations, and their findings:

Four cesspools on the New York Avenue side and one on the Brooklyn Avenue side of the facility were sampled in August 1996 as part of the Operable Unit No. 1 (source removal) remedial investigation. The results showed the soils in these cesspools were below clean up objectives with only one detection of 1,1,1-TCA at 27 ppb. The buildings were connected to the municipal sewer line below New York Avenue and these cesspools were abandoned in 1980, before Tishcon's occupancy. See Figure 3 for the locations of the five abandoned cesspools.

An additional cesspool on the Brooklyn Avenue side of the facility, a sealed storm drain, and outdoor floor drain were reported to have received waste materials. Sampling of the cesspool sediments by Tishcon in July 1995 showed high concentrations of 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), and 1,1,1-trichloroethane (1,1,1-TCA). The sample results from the storm drain, outdoor floor drain, and cesspool sediment samples are summarized in Table 1.

An IRM soil removal was completed by Tishcon in October and November 1997 to address soil contamination in the out-of-service cesspool, sealed storm drain, and exterior floor drain (See Figure 3 for location of structures). More information on the IRM is available in the January 1998 ROD and the March 1998 report entitled Interim Remedial Measures Final Report.

For additional information on the soils contamination, refer to the Operable Unit No. 01 Record of Decision (ROD), dated January 1998. The ROD called for the installation of an AS/SVE system to address on-site soil and groundwater contamination.

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to human health and the environment posed by the presence of hazardous waste, Tishcon completed a Focused Remedial Investigation/Feasibility Study (FRI/FS).

4.1: Summary of the Focused Remedial Investigation

The purpose of the FRI was to define the nature and extent of any contamination in the groundwater resulting from previous waste disposal activities at the site.

Tishcon completed remedial investigative work in June 1998. A report entitled Remedial Investigation for Groundwater, Tishcon Corporation, dated July 1999, has been prepared which describes the field activities and findings of the RI in detail.

These investigations were conducted in part using a geoprobe, a vehicle mounted probe unit capable of advancing a small diameter sampling device to depths of approximately 90 feet below ground surface (bgs) to collect either soil or groundwater samples.

The RI included the following activities:

- *Sampling of five (5) existing on-site monitoring wells. Three (3) screened in the shallow aquifer (60 feet), one (1) in the intermediate aquifer (80 feet), and one (1) in the deep aquifer (95 feet);*

- *Sampling of three (3) existing off-site monitoring wells screened in the shallow aquifer (60 feet);*

- *Installation of geoprobe points to assess areal and vertical extent of groundwater contamination. Included were one (1) on-site and two (2) off-site points in the shallow aquifer (60 feet), three (3) on-site and three (3) off-site points in the intermediate aquifer (80 feet), and three (3) on-site and two (2) off-site points in the deep aquifer (95 feet).*

- *Eight (8) on-site borings as part of the soil profile investigation to collect information needed to design the on-site AS/SVE remediation system.*

To learn if the groundwater contains contamination at levels of concern, the Remedial Investigation analytical data was compared with environmental Standards, Criteria, and Guidance values (SCGs) (See Tables 3A & 3B). Groundwater and drinking water SCGs identified for the Tishcon site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of New York State Sanitary Code.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, groundwater requires remediation. Specifically, 1,1,1-TCA is present at levels as high as 22,000 ppb which exceeds the groundwater standard of 5 ppb. Complete information can be found in the Remedial Investigation (RI) Report.

4.1.1 Geology and Hydrogeology

The Upper Pleistocene deposits of poorly sorted sands and gravel that make up the Upper Glacial Aquifer (UGA) are found from the surface to a depth of approximately 80 ft bgs. The UGA is an unconfined aquifer consisting of poorly sorted sands and gravels. The underlying Magothy consists of finer sands, silt and small amounts of clay.

At the site there are no other hydrogeologic units located between the UGA and the underlying Magothy formation. In general, the upper surface of the Magothy formation is found at least 100 ft bgs. However, based on observations during installation of wells for this investigation, the Magothy is found at significantly shallower depths (60-87 ft bgs) in the NCIA than in many other areas of Long Island. The UGA and the Magothy are in direct hydraulic connection; however, clay lenses are often found in the upper Magothy in this area. Depth of water is about 52 ft bgs in the area of the site and groundwater flows in a southwesterly direction. Both the UGA and Magothy have been designated as sole-source aquifers and are protected under state and federal legislation.

4.1.2 Nature of Contamination

As described in the RI Report, groundwater samples were collected at the site to characterize the nature and extent of contamination. The main category of contaminants that exceeds SCGs is volatile organic compounds (VOCs).

The VOC contaminants of concern are 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethene (1,1-DCE), and 1,1-dichloroethane (1,1-DCA).

4.1.3 Extent of Contamination

Tables 2, 3A, and 3B summarize data for the contaminants of concern in groundwater and compare it with the SCGs for the site. The following are the media investigated and a summary of the findings:

Soil

A remedial investigation of the on-site soils was completed in August of 1996. Details and results of this investigation can be found in the report entitled Final Focused Remedial Investigation Report, dated May 1997. In addition, a Record of Decision (ROD) was issued in January of 1998 which summarizes the results of the soil investigation. The 1998 ROD requires remediation of the on-site soils and groundwater by an air sparging/soil vapor extraction system.

Groundwater

The Department has been using a three-prong strategy in remediating Class 2 sites in the NCIA. The first action identifies source areas at each site which will be remediated or removed; the second action includes the investigation and proper remediation of groundwater contamination at and beneath each site; and the third action is the ongoing effort by the Department to investigate groundwater contamination that is migrating off-site from all Class 2 sites within the New Cassel Industrial Area. Upon completion of this groundwater investigation, the Department will

propose a remedy to the public. After public review, a final groundwater remedy will be selected.

The groundwater flow direction was determined as part of the investigation. The groundwater elevation data showed that groundwater flows from the northeast to the southwest. This groundwater flow direction is in agreement with those found in previous investigations completed throughout the NCIA.

Results from the groundwater investigation show that groundwater leaving the site contains higher levels of VOCs than groundwater entering the site. See Figures 4, 5, 6, and 7 and Tables 2, 3A, and 3B which refer to groundwater flow direction, sampling locations, and the associated analytical data. The following is a discussion of the groundwater data at each depth interval investigated:

Shallow Groundwater (60 feet bgs)
Three (3) geoprobe locations and seven (7) monitoring wells were sampled in the 60 foot depth horizon. The data showed 1,1,1-TCA contamination ranging from <1 ppb to 22,000 ppb. See Figure 4 for complete shallow groundwater sampling results.

Monitoring well AIMW-11A is an up-gradient well. The sampling data from this well showed that shallow groundwater entering the site has 1,1,1-TCA concentration of 400 ppb. This contamination is primarily attributable to the up-gradient Arkwin Industries site (Site No. 1-30-043 D). Contamination resulting from operations at the Arkwin site was addressed in RODs for the site dated January 1998 and November 1999.

TW-1, MDCW-1, and NC-24 are on-site monitoring wells and TGP-4 is an on-site geoprobe location. The data from these locations showed that on-site shallow groundwater has 1,1,1-TCA contamination ranging from 3,800 ppb (TGP-4) to 22,000 ppb (MDCW-1) compared to the groundwater standard of 5 ppb. The average on-site shallow groundwater concentrations of 1,1,1-TCA contamination was 14,200 ppb.

Monitoring wells 11855, 11854, and NC-11 are shallow down-gradient wells. These wells showed 1,1,1-TCA contamination ranging from <1 ppb to 149 ppb. TGP-A and TGP-B are shallow down-gradient geoprobe locations. The groundwater from these locations is contaminated with 1,1,1-TCA at levels of 20,900 ppb and 1,340 ppb, respectively.

The shallow aquifer data indicate that on-site and down-gradient groundwater is more contaminated than the up-gradient groundwater.

Intermediate Groundwater (80 feet bgs)
Two (2) monitoring wells and six (6) geoprobe locations were sampled in the 80 foot depth horizon. The data showed 1,1,1-TCA contamination ranging from 17 ppb to 2,700 ppb. See Figure 5 for complete intermediate groundwater sampling results.

Monitoring well AIMW-11B is an up-gradient well. The data from this well showed 1,1,1-TCA contamination of 17 ppb. Again, as with the shallow groundwater, this is primarily attributable to the Arkwin Industries site located directly up-gradient.

MDCW-1 is an on-site monitoring well and TGP-1, TGP-2, TGP-4 are on-site geoprobe locations. The data from these locations showed 1,1,1-TCA contamination ranging from 24 ppb to 1,400 ppb. The average on-site intermediate groundwater concentration of 1,1,1-TCA was 403 ppb.

TGP-A, TGP-B, and TGP-3 are down-gradient geoprobe points. TGP-3 had 1,1,1-TCA contamination of 190 ppb. TGP-A and TGP-B showed 1,1,1-TCA contamination of 2,300 and 2,700 ppb, respectively.

The intermediate aquifer data indicate that on-site and down-gradient groundwater is more contaminated than up-gradient groundwater.

Deep Groundwater (95 feet bgs)

One (1) monitoring well and five (5) geoprobe locations were sampled in the 95 foot depth horizon. The data showed 1,1,1-TCA contamination ranging from 26 ppb to 910 ppb. See Figure 6 for complete deep groundwater sampling results.

Monitoring well AIMW-11C is an up-gradient well (screened at 150 feet bgs). The data from this well showed 1,1,1-TCA contamination of 5 ppb.

MDCW-1 is an on-site monitoring well and TGP-1, TGP-2, and TGP-4 are on-site geoprobe points. The data from these locations showed 1,1,1-TCA contamination ranging from 26 ppb to 910 ppb.

TGP-B and TGP-3 are down gradient geoprobe locations. These points showed 1,1,1-TCA contamination of 160 and 230 ppb, respectively.

Summary

Groundwater data for the site indicate that on-site and down-gradient groundwater quality has been impacted by the site. For example, 1,1,1-TCA was detected in MDCW-7 (an on-site location) at 22,000 ppb which exceeds the groundwater standard of 5 ppb for this compound. Groundwater entering the site shows 1,1,1-TCA at concentrations as high as 400 ppb which is significantly less than that found on-site and down-gradient.

As discussed in Section 1, the groundwater contamination migrating from the New Cassel Industrial Area has impacted the Bowling Green Water District supply wells. An active supplemental treatment system is in place to mitigate the impact of the contamination before the water is delivered to the Bowling Green Water District customers. However, contamination leaving the New Cassel Industrial Area, including the Tishcon site, remains a threat to the water quality in the aquifer and at the Bowling Green well field.

4.2 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site.

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

- *Ingestion of contaminated groundwater. Since an active supplemental treatment system is in place that prevents the completion of this exposure pathway, no known completed exposure pathways exist.*

The contaminated groundwater at the Tishcon site and within the entire NCIA represents a potential route of exposure to humans. The Bowling Green Water District, located down-gradient of the site, derives its water from the Magothy aquifer which has been impacted by the contaminants associated with the NCIA. After detection of site related contaminants during routine monitoring, an air stripping treatment system followed by carbon polishing was constructed in 1996 to mitigate the impact of the groundwater contamination on the Bowling Green public water supply wells. The Bowling Green Water District routinely samples the water supply to monitor the effectiveness of the treatment system. No site related contaminants have been detected exceeding drinking water standards in the water distributed to the public. Guard wells have been installed south of Old Country Road, in locations down-gradient of the NCIA inactive hazardous waste disposal sites and up-gradient of the water supply wells as a precautionary measure to detect any migrating plumes that could impact the well field. With these measures in place, the use of the groundwater in the area is not currently considered an exposure pathway of concern.

4.3 Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures that may be presented by the site. No significant sources of surface water are in close proximity to the site. The nearest surface water sources are several small ponds in and around Eisenhower Memorial Park, approximately two miles southwest of the site across Old Country Road. Nearly every open space in the industrial area has been developed with asphalt, concrete or buildings. As a result of the industrial area being so highly developed, no wildlife habitat exist in or near the site.

No known exposure pathways of concern between the contaminated groundwater and the environment exist. The potential for plants or animal species being exposed to site-related contaminants is unlikely.

SECTION 5: ENFORCEMENT STATUS

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

The only PRP for the site, documented to date, is Tishcon Corporation. The NYSDEC and Tishcon Corporation entered into a consent order in January 1998 for a groundwater RI/FS. The groundwater RI/FS was conducted by Tishcon in accordance with the consent order.

The following is the chronological enforcement history of this site.

Date	Index No.	Subject of Order
06/96	W1-0758-95-05	RI/FS & IRM for OU1
01/98	W1-0799-97-06	RI/FS & IRM for OU2
05/98	W1-0799-98-02	RD/RA for OU1

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all SCGs and to be protective of human health and the environment.

The Department has been using a three-prong strategy in remediating Class 2 sites in the New Cassel Industrial Area (NCIA). The first action identifies source areas at each site which will be remediated or removed; the second action includes the investigation and proper remediation of groundwater contamination at and beneath each site; and the third action is the ongoing effort by the Department to investigate groundwater contamination that is migrating off-site from all Class 2 sites within the New Cassel Industrial Area. Upon completion of this groundwater investigation, the department will propose a remedy to the public. After public review, a final groundwater remedy will be selected.

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

The goals selected for this site are:

- *Eliminate ingestion of groundwater that does not attain NYSDOH Drinking Water Standards.*
- *Eliminate, to the extent practicable, off-site migration of groundwater that does not meet NYSDEC Class GA Ambient Water Quality Criteria.*

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the Tishcon site were identified, screened and evaluated in the September 1999 report entitled Feasibility Study Report.

A summary of the detailed analysis follows. As presented below, the time to construct does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy. Time to implement is the expected time for the alternative to reach remedial objectives.

7.1: Description of Alternatives

The potential remedies are intended to address the contaminated groundwater down-gradient of the site. The on-site groundwater contamination is currently being remediated by the AS/SVE system required by the January 1998 ROD.

Alternative #1: No Action

Present Worth:	*$ 143,000*
Capital Cost:	*$ 0*
Annual O&M (years 1-5):	*$ 20,000*
Annual O&M (years 6-30):	*$ 5,000*
Time to Construct	*None*
Time to Implement	*30+ years*

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment. The site would remain as a Class 2 site.

Groundwater use restrictions would be implemented to prevent development of the underlying groundwater as a potable or process water source without the necessary water quality treatments. Quarterly sampling of six (6) existing and six (6) newly installed monitoring wells would be conducted for the first five years. Annual sampling of these twelve (12) monitoring wells would continue for years six through thirty.

Alternative #2: Air Sparging/Soil Vapor Extraction

Present Worth:	*$ 998,000*
Capital Cost:	*$ 580,000*
Annual O&M (years 1-5):	*$ 95,000*
Annual O&M (year 6):	*$ 9,000*
Time to Construct	*6 months*
Time to Implement	*5 years*

Air Sparging/Soil Vapor Extraction (AS/SVE) is a demonstrated in-situ physical/chemical treatment for remediating VOC contaminated groundwater. The AS/SVE system would include injection and extraction wells to volatilize and capture contaminants from the groundwater. Off-gas treatment and long-term groundwater monitoring would also be included as part of this alternative.

The Air Sparging component would consist of wells installed in the upper fifty feet of the aquifer, fifty to one-hundred feet bgs. These wells would inject air via compressors into the contaminated groundwater at controlled pressures and volumes to increase air/groundwater contact. The air/groundwater contact promotes the volatilization of dissolved VOCs and adsorbed phase contamination. The volatilized contaminants would then travel from the saturated zone into the unsaturated soils. The injection wells would be installed to ensure the entire area of concern would be effectively aerated, which may include overlapping zones of influence.

The vapor-phase contaminants would be collected with a vacuum pump connected to extraction wells. These wells would collect all vapor-phase contaminants and transport them to the surface. The vapors would be treated with a granular activated carbon filter before discharge to the atmosphere.

Pilot testing and field measurements would be necessary to determine the exact number of AS/SVE wells necessary to effectively remediate the areas of concern. It was assumed six (6) air sparge and three (3) soil vapor extraction points would be required. These points would be located down-gradient of the Tishcon property. The pilot testing data would be used in part to design the SVE system to ensure that all contaminants volatilized from the groundwater are captured and treated before release to the atmosphere. This would be done by ensuring the radius of influence of the extraction wells overlap the radius of influence of the sparging wells.

This system would be expected to stay in operation for five years. To ensure the system is achieving remedial objectives, groundwater quality would be monitored semiannually at six (6) existing and six (6) newly installed wells. The monitoring data would be reviewed annually to determine if the system has reached its objectives and could be deactivated.

Alternative #3: In Well Vapor Stripping/ Vapor Treatment

Present Worth:	*$ 1,243,000*
Capital Cost:	*$ 738,000*
Annual O&M (years 1-5):	*$ 115,000*
Annual O&M (year 6):	*$ 9,000*
Time to Construct	*6 months*
Time to Implement	*5 years*

Under this alternative, the groundwater contaminant plume would be treated in-situ using a series of groundwater circulation wells (or in-well stripping) to capture, treat, and re-circulate groundwater within the aquifer. The groundwater circulation well system creates in-situ vertical groundwater circulation cells by drawing groundwater from the aquifer through one screen

section of a double-screened well and discharging it through the second screen section. While groundwater circulates in and out of the stripping cell, no groundwater is removed from the ground. Air is injected into the well through an injection line and diffuser, releasing bubbles into the contaminated groundwater. These bubbles aerate the water and form an air-lift pumping system (due to an imparted density gradient) that causes groundwater to flow upward in the well. As the bubbles rise, VOC contamination in the groundwater is transferred from the dissolved state to the vapor state through an air stripping process.

The air/water mixture rises in the well until it encounters the dividing device within the inner casing. The divider is designed to maximize volatilization. The air/water mixture flows from the inner casing to the outer casing through the upper screen. A vacuum is applied to the outer casing, and contaminated vapors are drawn upward through the annular space between the two casings. The partially treated groundwater re-enters the subsurface through the upper screen and infiltrates back to the aquifer and the zone of contamination where it is eventually cycled back into the well. This pattern of groundwater movement forms a circulation cell in the subsurface around the well that allows groundwater to undergo sequential treatment cycles until remedial objectives are met.

Off-gas from the stripping system would be collected and treated using granular activated carbon filters.

Aquifer pump testing and field measurements would be necessary to determine the exact number of in well vapor stripping wells necessary to effectively remediate the areas of concern. It was assumed that three (3) groundwater circulation/stripping wells would be required. These points would be located down-gradient of the Tishcon property.

This system would be expected to remain in operation for six years. To ensure the system is achieving remedial objectives, groundwater quality would be monitored semiannually at six (6) existing and six (6) newly installed wells. The monitoring data would be reviewed annually to determine if the system has reached its objectives and could be deactivated.

Alternative #4: Groundwater Extraction/ Air Stripping/Re-Injection

Present Worth:	*$ 1,415,000*
Capital Cost:	*$ 824,000*
Annual O&M (years 1-6):	*$ 115,000*
Annual O&M (year 7):	*$ 9,000*
Time to Construct	*6 months*
Time to Implement	*6 years*

The groundwater extraction system would draw contaminated groundwater from the pumping well's zone of capture. The recovery flow rate is increased until the capture zone radius is sufficient to cover the lateral dimensions of the area of concern. The recovery wells would be located down-gradient of the property so that contaminated water would naturally flow to the capture zone.

The pumped groundwater would be collected at the surface for treatment. First it would enter a flow equalization tank, then a pH adjustment tank. The pH would be raised to about 8 to 10, and a coagulant would be added into the reaction tank to help flocculate and precipitate soluble inorganic constituents. Then, after passing through a mixer, the groundwater would enter a settling tank where an iron/manganese sludge would settle to the bottom of the tank. The groundwater then passes through a media filter to remove dissolved solids. An acidic compound would be added to lower the pH to 6 or 7 before the water is fed into a low profile tray air stripper. The low profile stripper would be selected over a stripping tower because the surrounding buildings are typically one story tall.

The vapor phase emitted from the air stripper would be collected and treated with granular activated carbon prior to discharge to the atmosphere.

The liquid effluent leaving the air stripper would be passed through a filter to remove any remaining solids before being discharged to the infiltration gallery. The infiltration gallery would consist of four wet wells (injection wells).

Aquifer pump testing and field measurements would be necessary to determine the placement and exact number of extraction wells necessary to effectively remediate the areas of concern. It was assumed that two (2) extraction wells would be required. These points would be located down-gradient of the Tishcon property.

This system would be expected to remain in operation for six years. To ensure the system is achieving remedial objectives, groundwater quality would be monitored semiannually at six (6) existing and six (6) newly installed wells. The monitoring data would be reviewed annually to determine if the system has reached its objectives and could be deactivated.

7.2 Evaluation of Remedial Alternatives

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

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

The data for the site shows SCGs are exceeded for VOCs in the on-site groundwater. The remedy selected for this site must remediate the groundwater to Class GA groundwater standards.

Since no remedial actions are included in Alternative 1, SCGs would not be met and concentrations of groundwater contaminants would remain at unacceptable levels.

Alternatives 2, 3, and 4 would involve actively treating the groundwater and would be designed to effectively remove VOCs to levels that meet SCGs.

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

Alternative 1 would not present an imminent public health concern since the Bowling Green Water District treats and routinely monitors groundwater and drinking water quality. However, Alternative 1 provides the least protection to human health and the environment as it does not provide for any active treatment of the groundwater.

Alternatives 2, 3, and 4 offer the greatest protection to public health and the environment by actively treating and reducing groundwater contamination.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternative 1 would not include construction activities and therefore no impact to construction workers or neighbors would exist. Groundwater contaminants would remain above SCGs and contribute to down-gradient groundwater contamination.

Alternatives 2, 3, and 4 provide the greatest short-term effectiveness as they actively remove contaminants in a relatively short period. These alternatives would require significant construction activity exposing workers and neighbors to dust and machinery. A community air monitoring plan and a health and safety plan would mitigate this problem.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

Alternative 1 would leave the site in its present condition. VOCs would remain at present levels and in excess of groundwater standards.

Alternatives 2, 3, and 4 would effectively and permanently remove VOCs from the groundwater.

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

Alternative 1 would not result in any reduction of toxicity, mobility or volume of contaminants.

Alternatives 2, 3, and 4 would greatly reduce the toxicity, mobility, and volume of contaminants by permanently removing VOCs from the groundwater.

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

Alternative 1 requires monitoring of existing monitoring wells only and would be easily implementable.

Alternatives 2, 3, and 4 are readily implementable with only minor property access issues that would need to be addressed.

7. Cost. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision.

Alternative 1 is the least costly but would leave the groundwater in its present condition.

Alternatives 2, 3, and 4 have present worth costs of $998,000, $1,243,000, and $1,415,000, respectively. Alternatives 2 and 3 are similar in the other balancing criteria, however, alternative 2 is more cost-effective. Alternative 4 is the least cost-effective.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and how the Department will address the concerns raised. No significant site specific comments were received.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

The Department has been using a three-prong strategy in remediating Class 2 sites in the NCIA.

In accordance with the three-prong strategy, on-site sources of contamination at the Tishcon site were remediated in 1997. As required by the 1998 ROD, an Air Sparging/Soil Vapor Extraction system is in operation to remediate the on-site groundwater (and residual soil contamination) which satisfies the second prong of the three-prong strategy. This ROD addresses off-site groundwater contamination that has migrated from the Tishcon site and is a component of the overall NCIA off-site groundwater remedy. In addition this ROD will be the third prong of the remedial strategy for this site.

A summary of the on-going remedial action for the on-site groundwater, and a discussion of the selected remedy for the off-site groundwater are presented below:

On-site groundwater contamination:

The selected remedy for any site should, at a minimum, eliminate or mitigate all significant threats to the public health or the environment presented by the hazardous waste present at the site. The State believes that the AS/SVE remediation system (Please see Figures 8 & 9), which is described in more detail in the January 1998 ROD and Remedial Design Report, will accomplish this objective for the on-site groundwater. The AS/SVE system will, as designed and constructed, address groundwater contamination up to 100 feet bgs as well as the more highly contaminated shallow groundwater.

See Figures 9 and 10 for details of the on-site soil vapor extraction and air sparging systems required by the 1998 ROD. Additional details of the on-site AS/SVE system can be found in the 1998 ROD and the Remedial Design Report for this site.

The following is a summary of the selected remedy for the off-site groundwater contamination:

Off-site groundwater contamination:
This off-site groundwater remedy will be a component of the comprehensive NCIA groundwater remediation system. Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is selecting Alternative 2, Air Sparging/Soil Vapor Extraction, as the remedy of choice.

This selection is based upon the evaluation of the four (4) alternatives developed for this site. Alternative 1 did not provide for protection of human health and the environment. This is considered a threshold criteria, and therefore, Alternative 1 was dropped from further consideration. Alternatives 2, 3, and 4 met the threshold criteria and were similar in the remaining balancing criteria. Alternatives 3 and 4 differ from 2 mainly in that Alternatives 3 and 4 are more costly.

Alternative 2, Air Sparging/Soil Vapor Extraction, will be protective of human health and the environment, provides a permanent solution for (the top fifty feet of the aquifer, or approximately 100 feet bgs) the off-site groundwater contamination, provides both short term and long term effectiveness, and is the least costly of the alternatives that satisfy all the criteria. In addition, the AS/SVE treatment system can be tied in with the AS/SVE system which is currently in operation, thereby resulting in a reduced overall cost for the remedy.

The purpose of the air sparging component of the AS/SVE system is to volatilize contaminants in the soil and groundwater.

The purpose of the soil vapor extraction system is to recover the volatilized contaminants within the soil pores mobilized from the groundwater by the air sparging system. See Figure 10 for the conceptual schematic of the selected off-site remedy and Figure 11 for a schematic of a typical AS/SVE system.

Effluent air from the SVE system will be monitored to track system parameters and overall performance. The data will be used to determine if the system is effectively remediating the sources and to learn when the system has attained it's goals and could be shut down.

The AS/SVE system required in the 1998 ROD and this ROD will remain in operation until 1) the groundwater quality meets SCGs for all contaminants of concern; 2) the data shows that the contaminants of concern have reached an asymptotic condition, as determined by the Department, and is no longer effectively removing contaminants of concern; or 3) on-site and down-gradient groundwater contamination is at or less than up-gradient groundwater contamination at the time of re-evaluation. When one of the above criteria is met the system will be shut down and the on-site, up-gradient, and down-gradient groundwater quality will be re-evaluated. To ensure that these objectives are met, groundwater quality will be monitored in on-site, down-gradient, and up-gradient monitoring wells. The monitoring program will remain in effect until the remedial objectives have been met and the data confirms that the system can be decommissioned. If the groundwater had not been remediated, additional measures will be evaluated to address the remaining groundwater contamination.

The radius of influence for the remediation system will extend approximately 10 feet south of the NCIA boundary and underneath Old Country Road. As a result, groundwater contamination 10 feet south of the NCIA border will be addressed as part or this remedial action. The elements of the selected remedy will include:

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

- *Installation of injection wells to introduce air into the groundwater promoting volatilization of the VOC contamination.*

- *Installation of extraction wells to capture contaminants volatilized from the groundwater.*

- *Installation of activated carbon filters for treatment of volatilized contaminants prior to release to the atmosphere.*

- *Semiannual sampling of six (6) existing and six (6) newly installed groundwater monitoring wells (two clusters of three in each cluster) will be conducted to monitor the effectiveness of the system. The monitoring data will be reviewed annually to determine if the system has reached its objectives and can be deactivated.*

- *Off-site (down-gradient) groundwater contamination will be addressed as a part of the overall investigation of the groundwater contamination that is migrating from all Class 2 sites in the NCIA.*

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

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

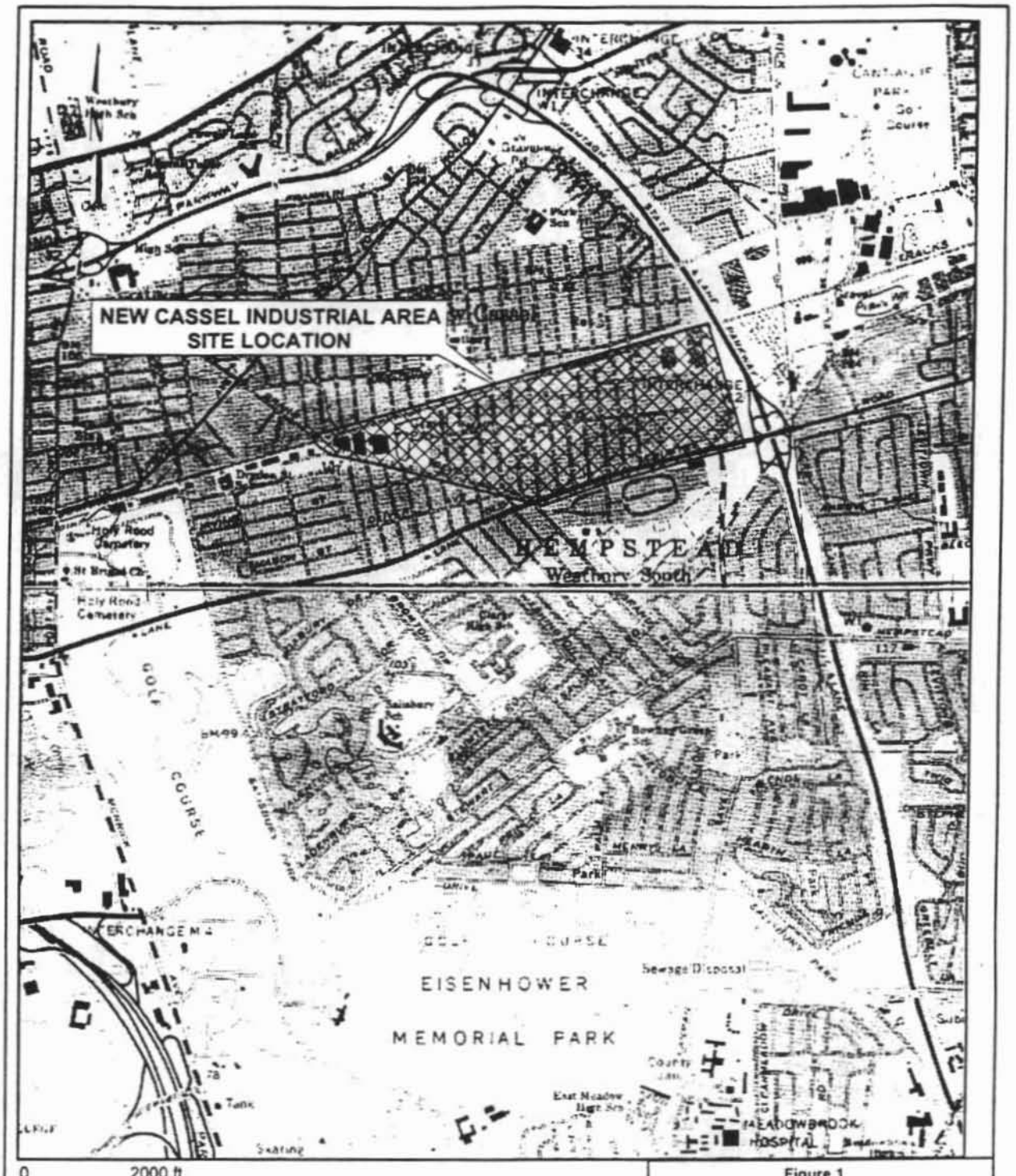
- Repositories for documents pertaining to the site were established.

- A site mailing list was established which included nearby property owners and residents, local political officials, the New Cassel Environmental Justice Project, local community groups, local media and other interested parties.

- Fact sheets were distributed to an extensive public contact list and conducted public meetings in May 1995, January 1996, May 1996, October 1996, May 1997, December 1997, May 1998, December 1998, May 1999, September 1999 and February 2000.

- Details of the remedial investigation were presented to the public at the September 1999 meeting. The PRAP was presented at the February 3, 2000 public meeting held at the Park Avenue School in Westbury, New York.

- In March 2000 a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the PRAP.



0 2000 ft

SCALE
1 in. = 2000 ft

Map source:
USGS 7.5-minute quadrangle series,
Freeport, NY, 1969, photorevised 1979,
Hicksville, NY, 1967, photorevised 1979

NEW YORK STATE

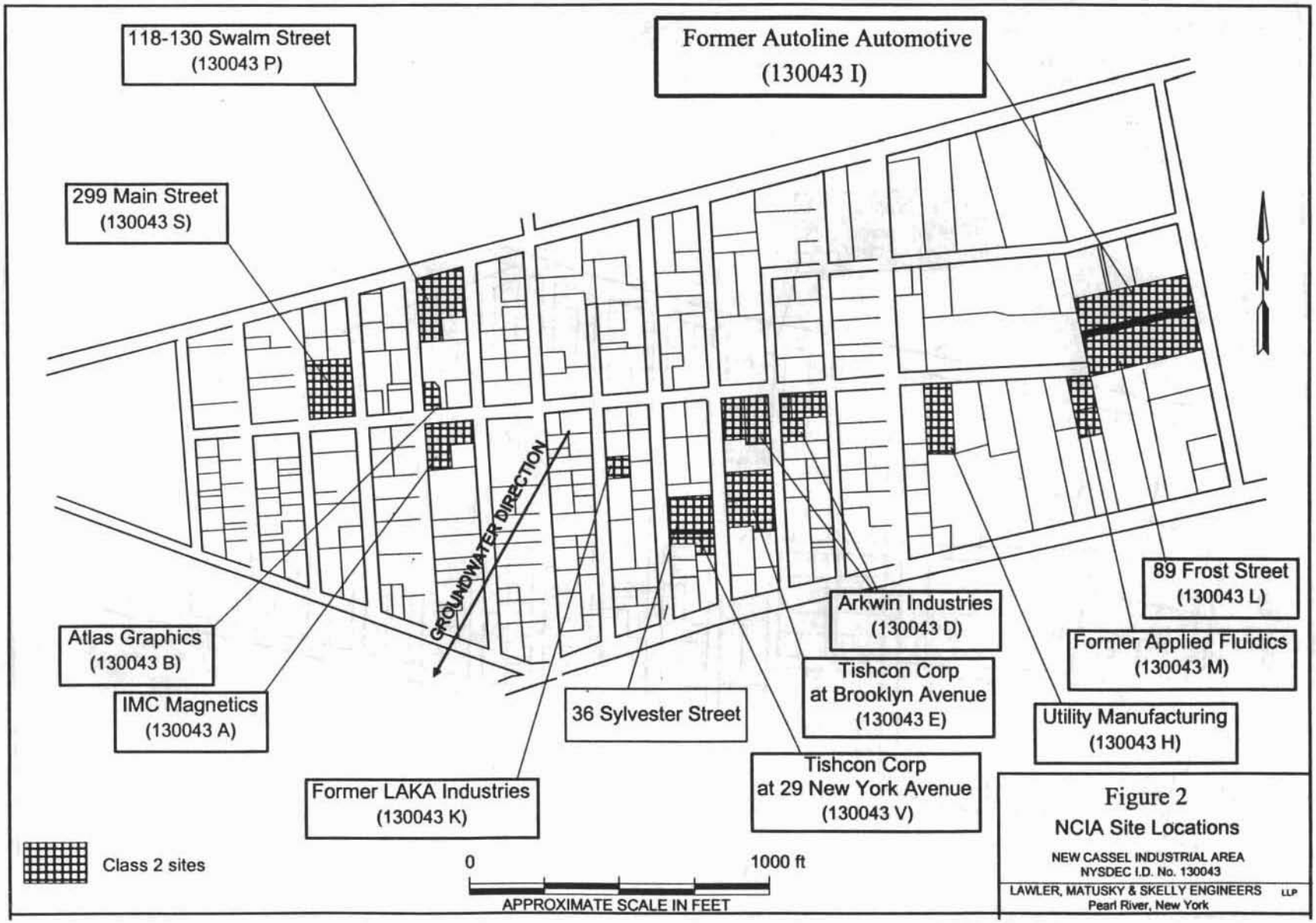
QUADRANGLE LOCATION

Figure 1

New Cassel Industrial Area
Site Location

NEW CASSEL INDUSTRIAL AREA
NYSDEC I.D. No. 130043D

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


118-130 Swalm Street
(130043 P)
Former Autoline Automotive
(130043 I)
299 Main Street
(130043 S)
N
GROUNDWATER DIRECTION
89 Frost Street
(130043 L)
Arkwin Industries
(130043 D)
Former Applied Fluidics
(130043 M)
Atlas Graphics
(130043 B)
Tishcon Corp
at Brooklyn Avenue
(130043 E)
IMC Magnetics
(130043 A)
36 Sylvester Street
Utility Manufacturing
(130043 H)
Tishcon Corp
at 29 New York Avenue
(130043 V)
Former LAKA Industries
(130043 K)
Class 2 sites
0
1000 ft
APPROXIMATE SCALE IN FEET
Figure 2
NCIA Site Locations
NEW CASSEL INDUSTRIAL AREA
NYSDEC I.D. No. 130043
LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York

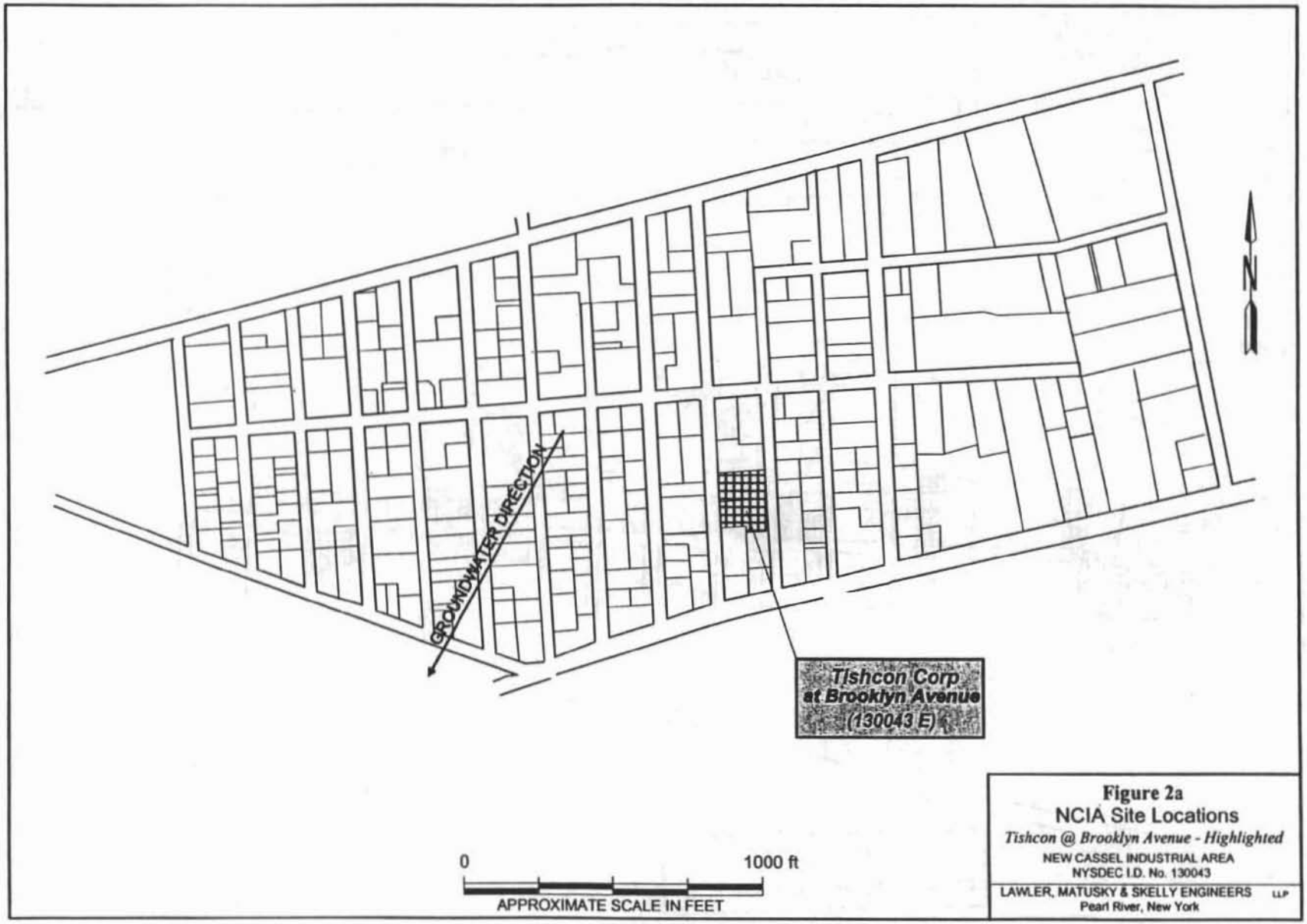
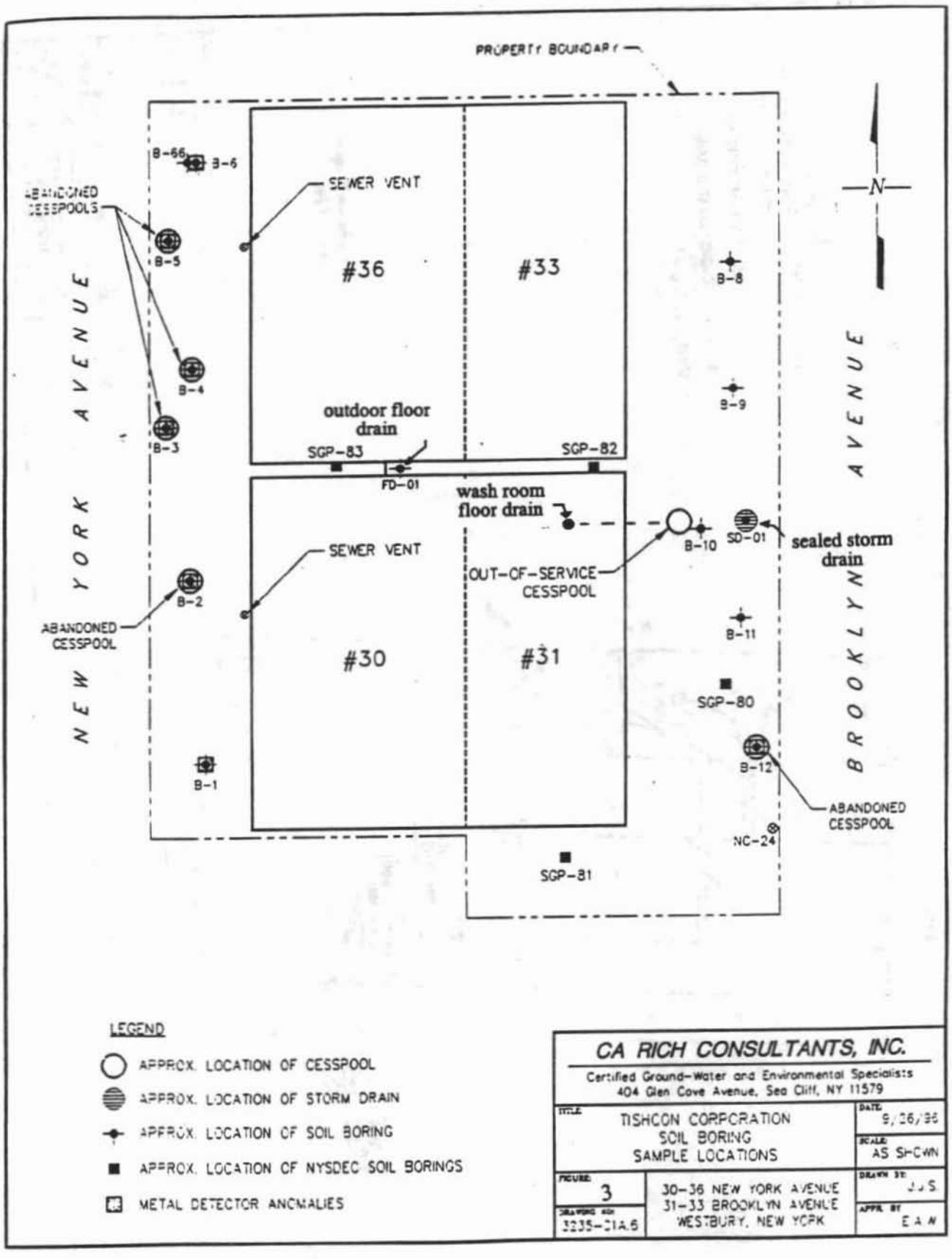


Figure 2a
NCIA Site Locations
Tishcon @ Brooklyn Avenue - Highlighted
NEW CASSEL INDUSTRIAL AREA
NYSDEC I.D. No. 130043
LAWLER, MATUSKY & SKELLY ENGINEERS LLP
Pearl River, New York



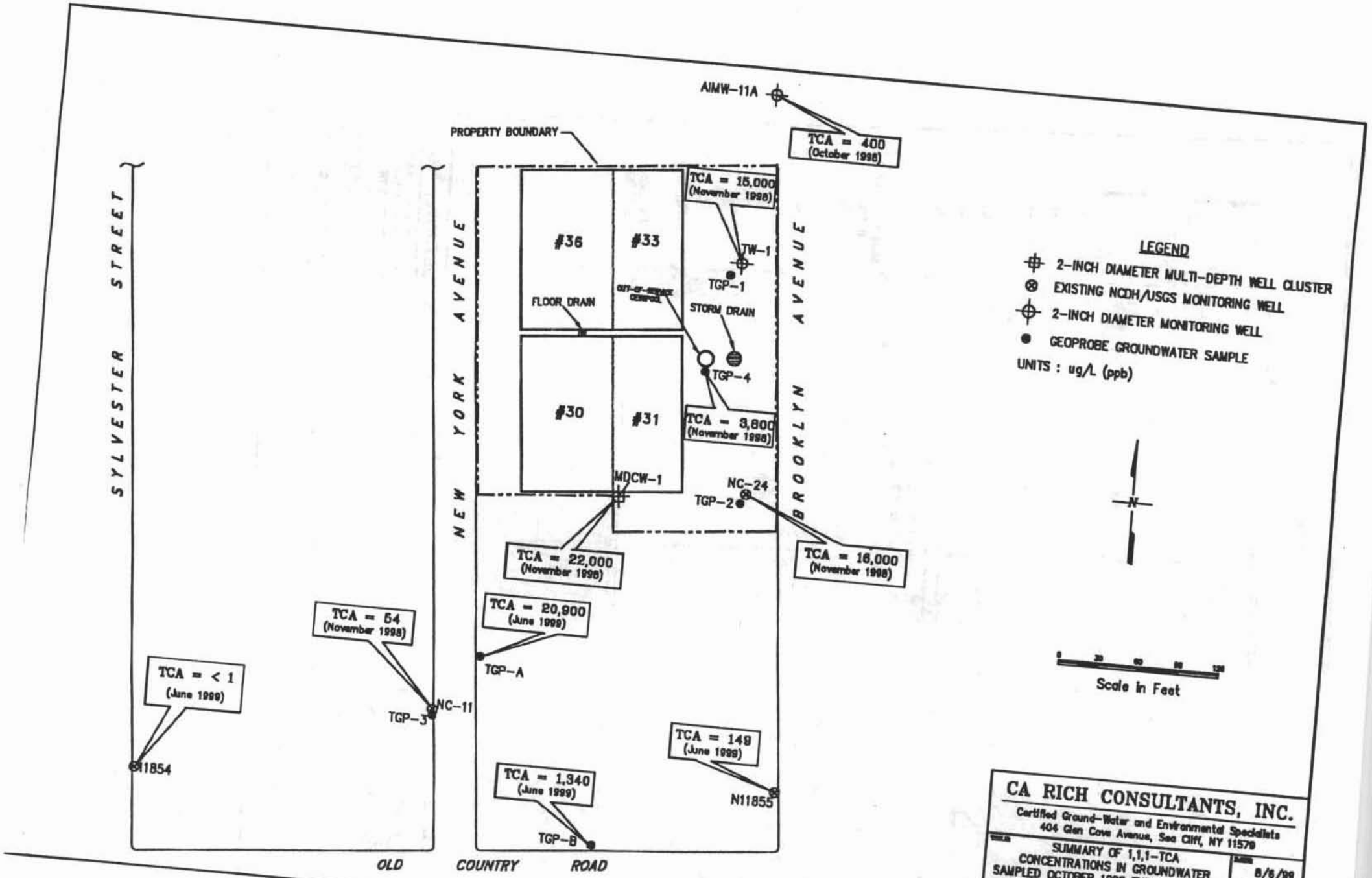
LEGEND

- APPROX. LOCATION OF CESSPOOL
- APPROX. LOCATION OF STORM DRAIN
- APPROX. LOCATION OF SOIL BORING
- APPROX. LOCATION OF NYSDEC SOIL BORINGS
- METAL DETECTOR ANOMALIES

CA RICH CONSULTANTS, INC.

Certified Ground-Water and Environmental Specialists
404 Glen Cove Avenue, Sea Cliff, NY 11579

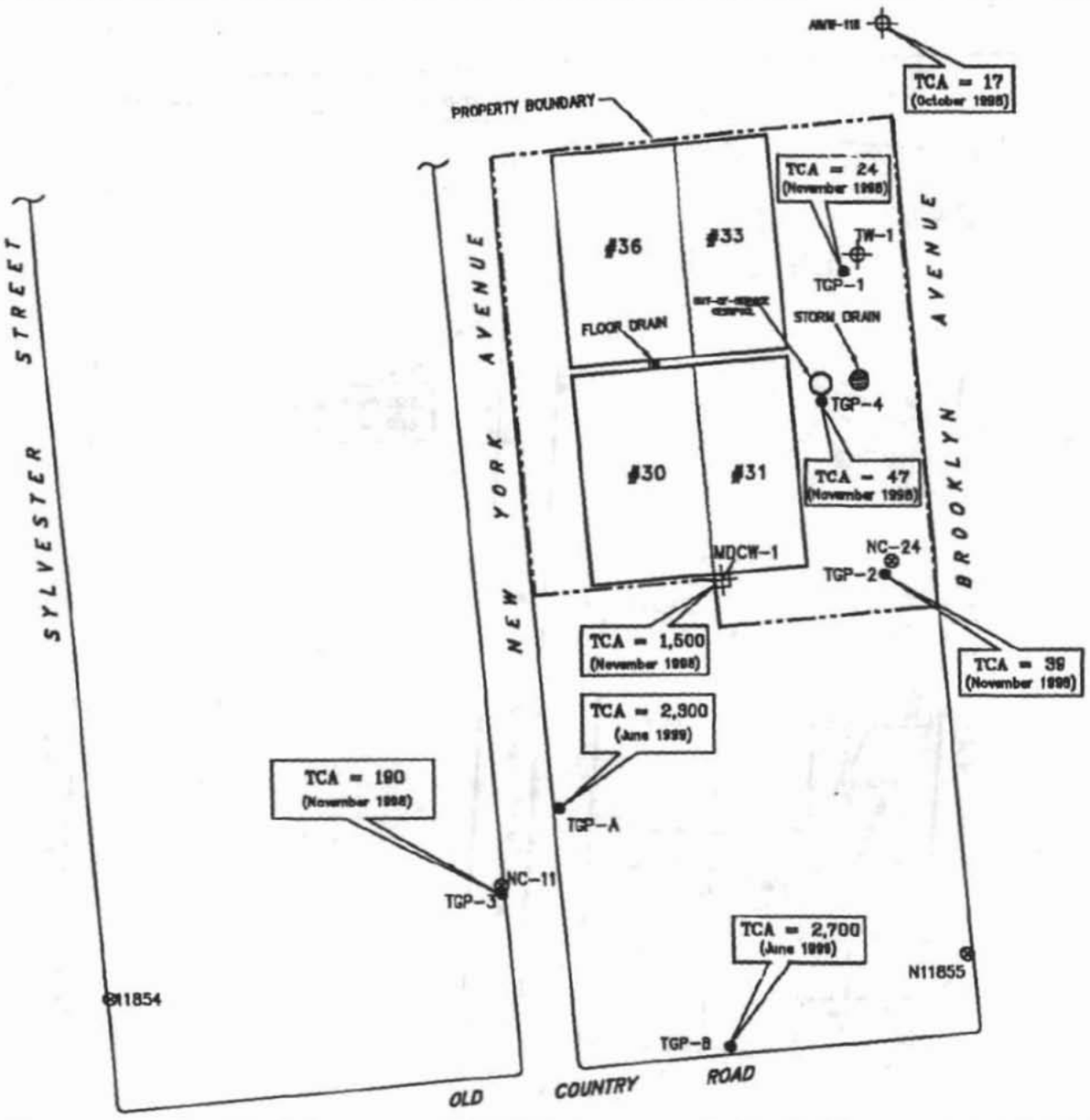
TITLE: TISHCON CORPORATION SOIL BORING SAMPLE LOCATIONS		DATE: 9/26/88
		SCALE: AS SHOWN
FIGURE: 3	30-36 NEW YORK AVENUE 31-33 BROOKLYN AVENUE WESTBURY, NEW YORK	DRAWN BY: J.J.S.
DRAWING NO: 3235-21A.6		APPR. BY: E.A.N.



CA RICH CONSULTANTS, INC.

Certified Ground-Water and Environmental Specialists
404 Glen Cove Avenue, Sea Cliff, NY 11579

TITLE: SUMMARY OF 1,1,1-TCA CONCENTRATIONS IN GROUNDWATER SAMPLED OCTOBER 1998 THRU JUNE 1999 FROM THE 60 FOOT DEPTH HORIZON	DATE: 8/6/99
PROJECT: 4	SCALE: AS SHOWN
DRAWING NO: 1019-1B5	30-36 NEW YORK AVENUE 31-33 BROOKLYN AVENUE WESTBURY, NEW YORK	DRAWN BY: S.T.M.
	APPR. BY: E.A.W.



LEGEND

- 2-INCH DIAMETER MULTI-DEPTH WELL CLUSTER
- EXISTING NCDH/USGS MONITORING WELL
- 2-INCH DIAMETER MONITORING WELL
- GEOPROBE GROUNDWATER SAMPLE

UNITS : ug/L (ppb)

N

Scale in Feet

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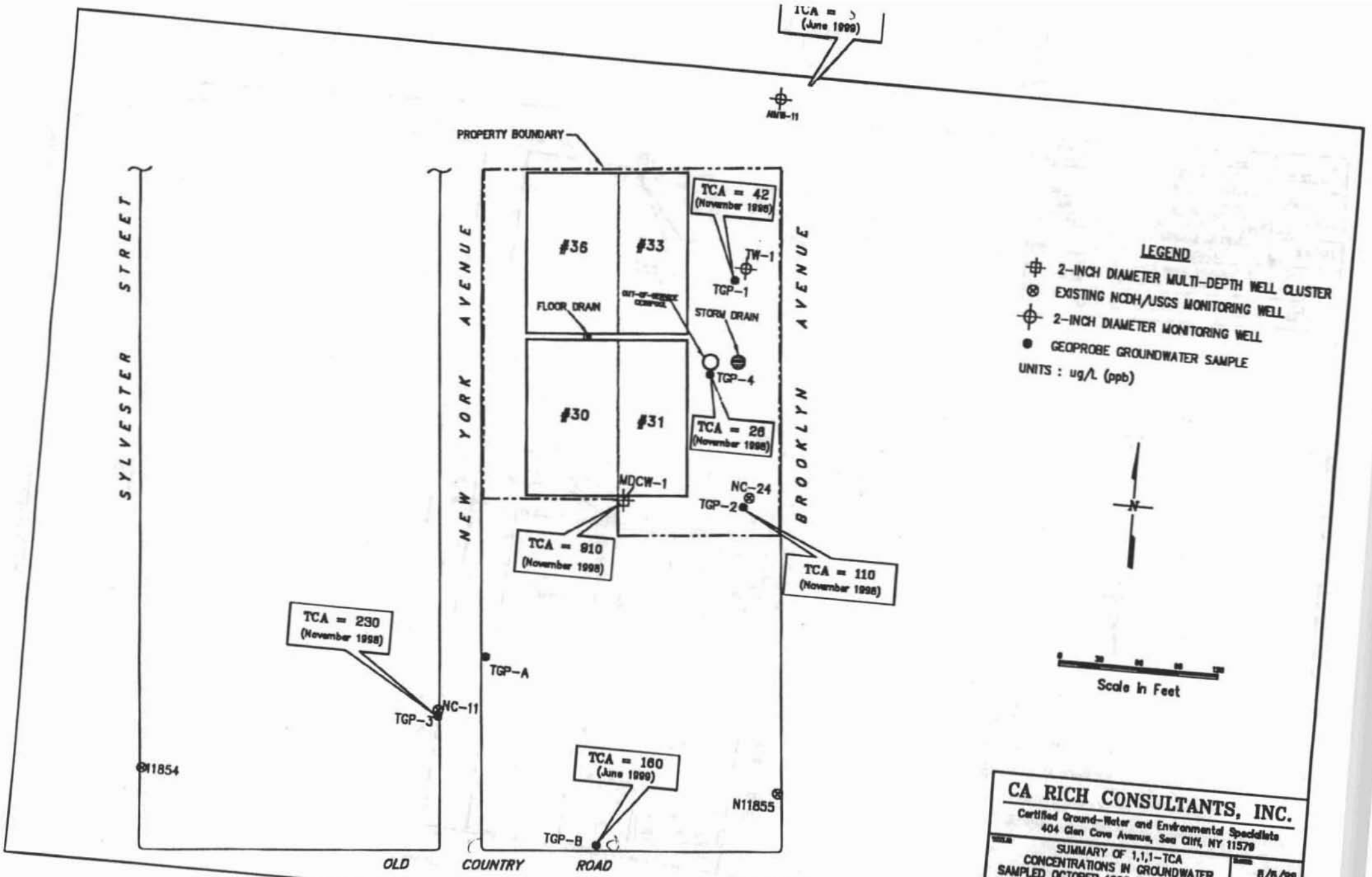
Certified Ground-Water and Environmental Specialists
404 Glen Cove Avenue, Sea Cliff, NY 11579

SUMMARY OF 1,1,1-TCA CONCENTRATIONS IN GROUNDWATER SAMPLED OCTOBER 1998 THRU JUNE 1999 FROM THE 80 FOOT DEPTH HORIZON		DATE: 7/2/99
		SCALE: AS SHOWN
FIGURE: 5	30-36 NEW YORK AVENUE 31-33 BROOKLYN AVENUE WESTBURY, NEW YORK	DRAWN BY: S.T.M.
DRAWING No: 1019-186		APPR. BY: E.A.W.



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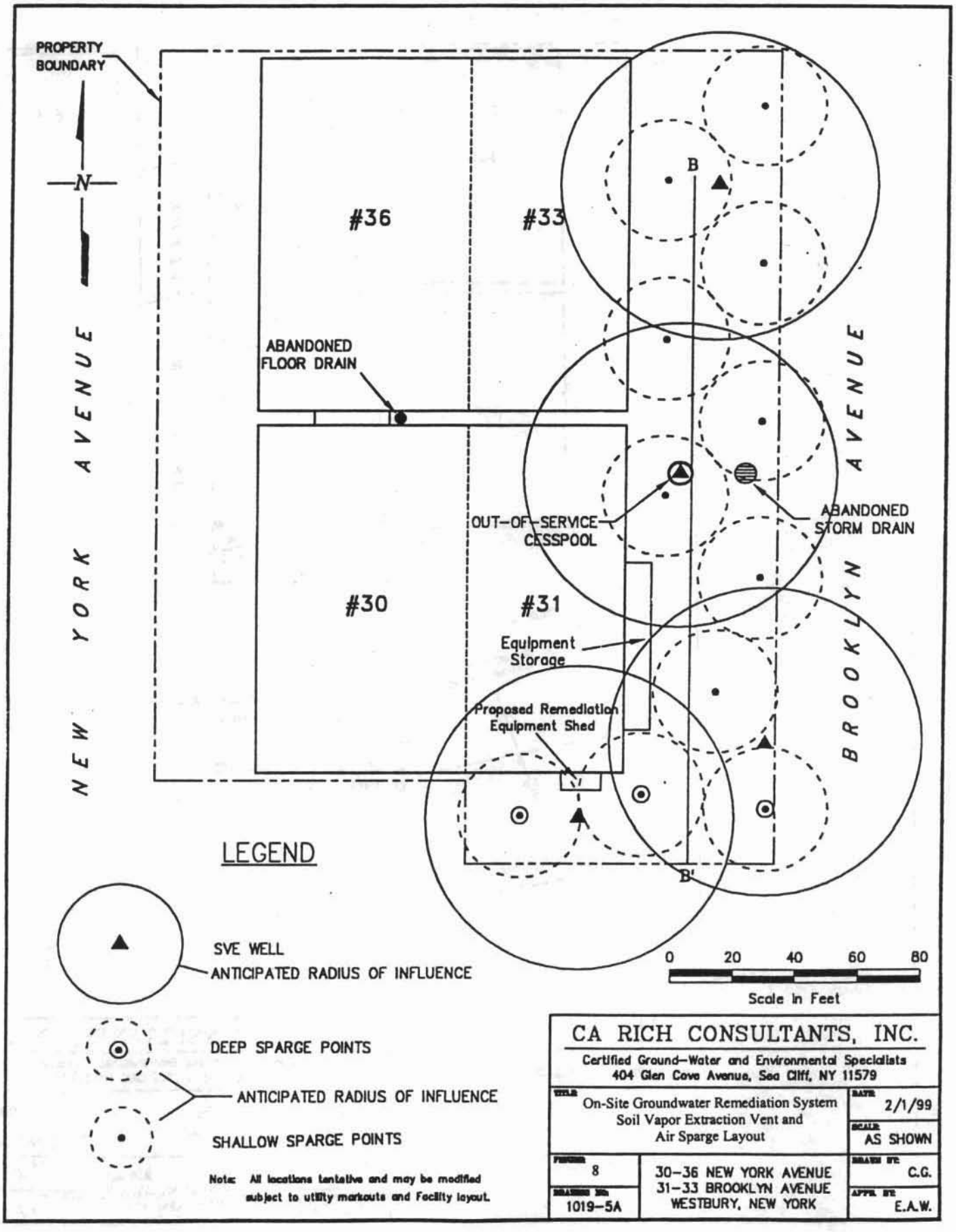
404 Glen Cove Avenue, Sea Cliff, NY 11579

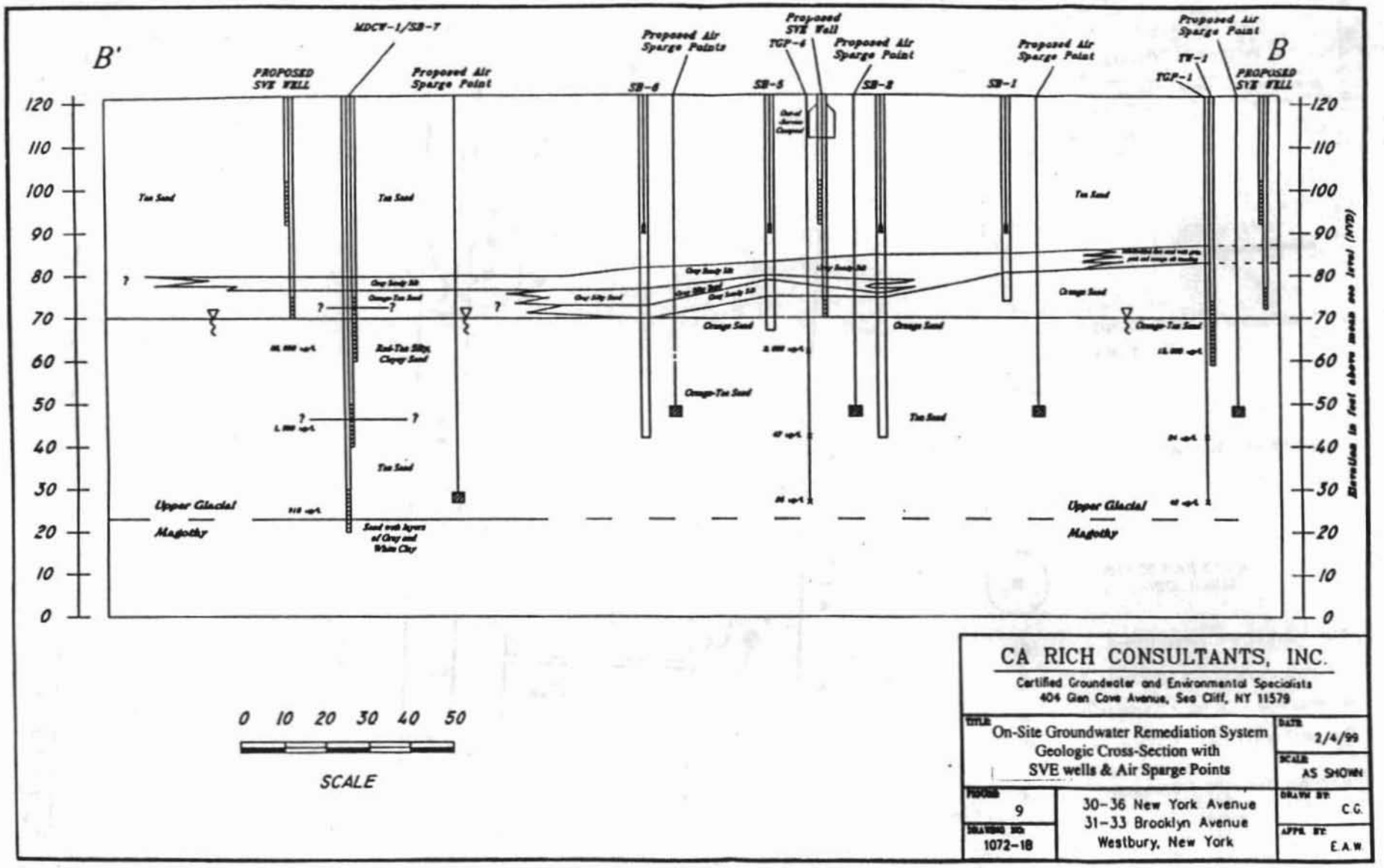
SUMMARY OF 1,1,1-TCA CONCENTRATIONS IN GROUNDWATER SAMPLED OCTOBER 1998 THRU JUNE 1999 FROM THE 95 FOOT DEPTH HORIZON

6	30-36 NEW YORK AVENUE 31-33 BROOKLYN AVENUE WESTBURY, NEW YORK
1019-185	

8/6/99
AS SHOWN
S.T.M.
E.A.W.



CA RICH CONSULTANTS, INC.		
Certified Ground-Water and Environmental Specialists 404 Glen Cove Avenue, Sea Cliff, NY 11579		
TITLE: On-Site Groundwater Remediation System Soil Vapor Extraction Vent and Air Sparge Layout		DATE: 2/1/99 SCALE: AS SHOWN
PROJECT: 8	30-36 NEW YORK AVENUE 31-33 BROOKLYN AVENUE WESTBURY, NEW YORK	DRAWN BY: C.G.
DRAWING NO.: 1019-5A		APPR. BY: E.A.W.



CA RICH CONSULTANTS, INC.

Certified Groundwater and Environmental Specialists
404 Glen Cove Avenue, Sea Cliff, NY 11579

TITLE: On-Site Groundwater Remediation System Geologic Cross-Section with SVE wells & Air Sparge Points	DATE: 2/4/99
	SCALE: AS SHOWN
PROJECT: 9	30-36 New York Avenue 31-33 Brooklyn Avenue Westbury, New York
DRAWING NO.: 1072-18	DRAWN BY: C.G.
	APPR. BY: E.A.W.

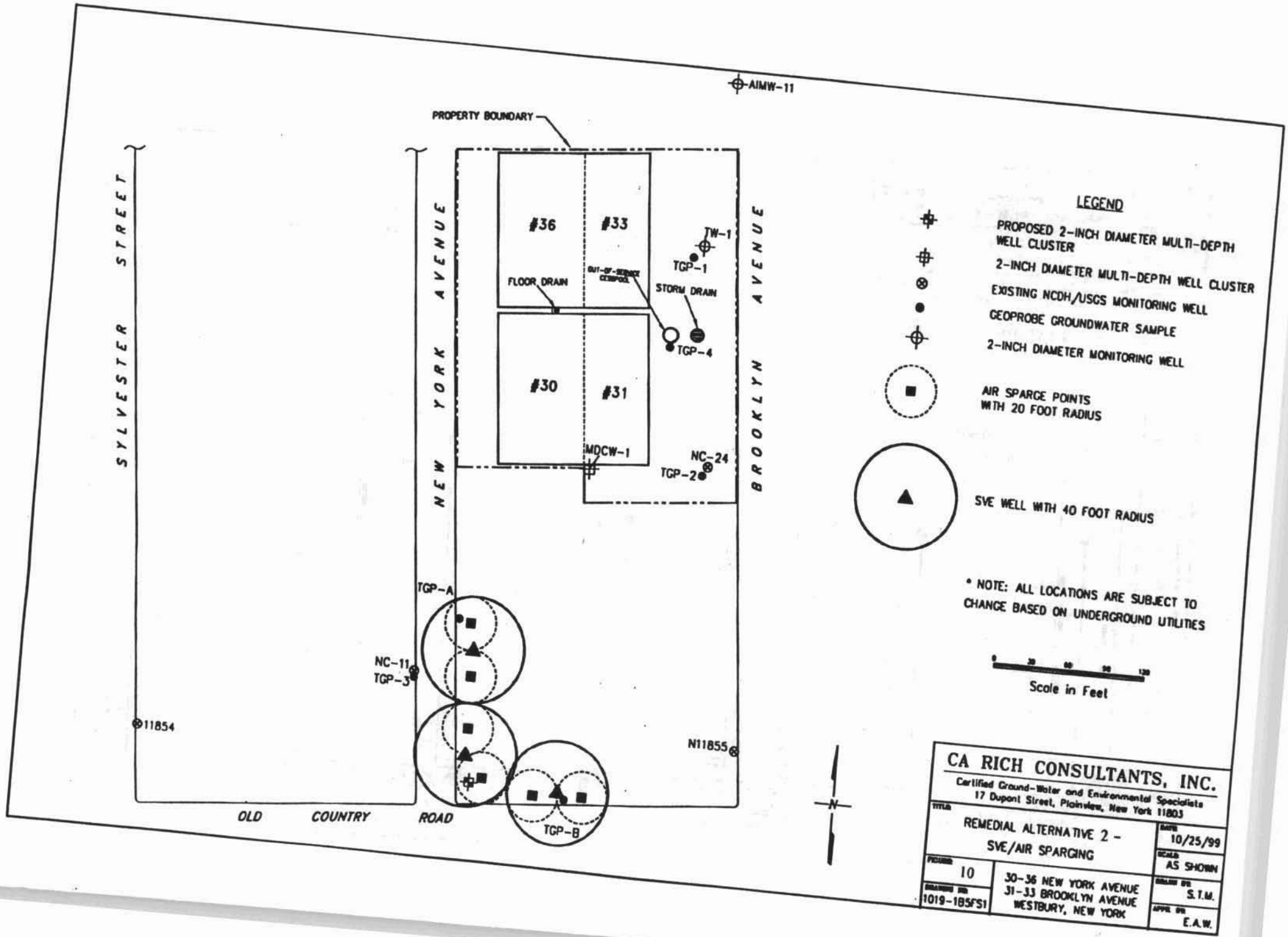
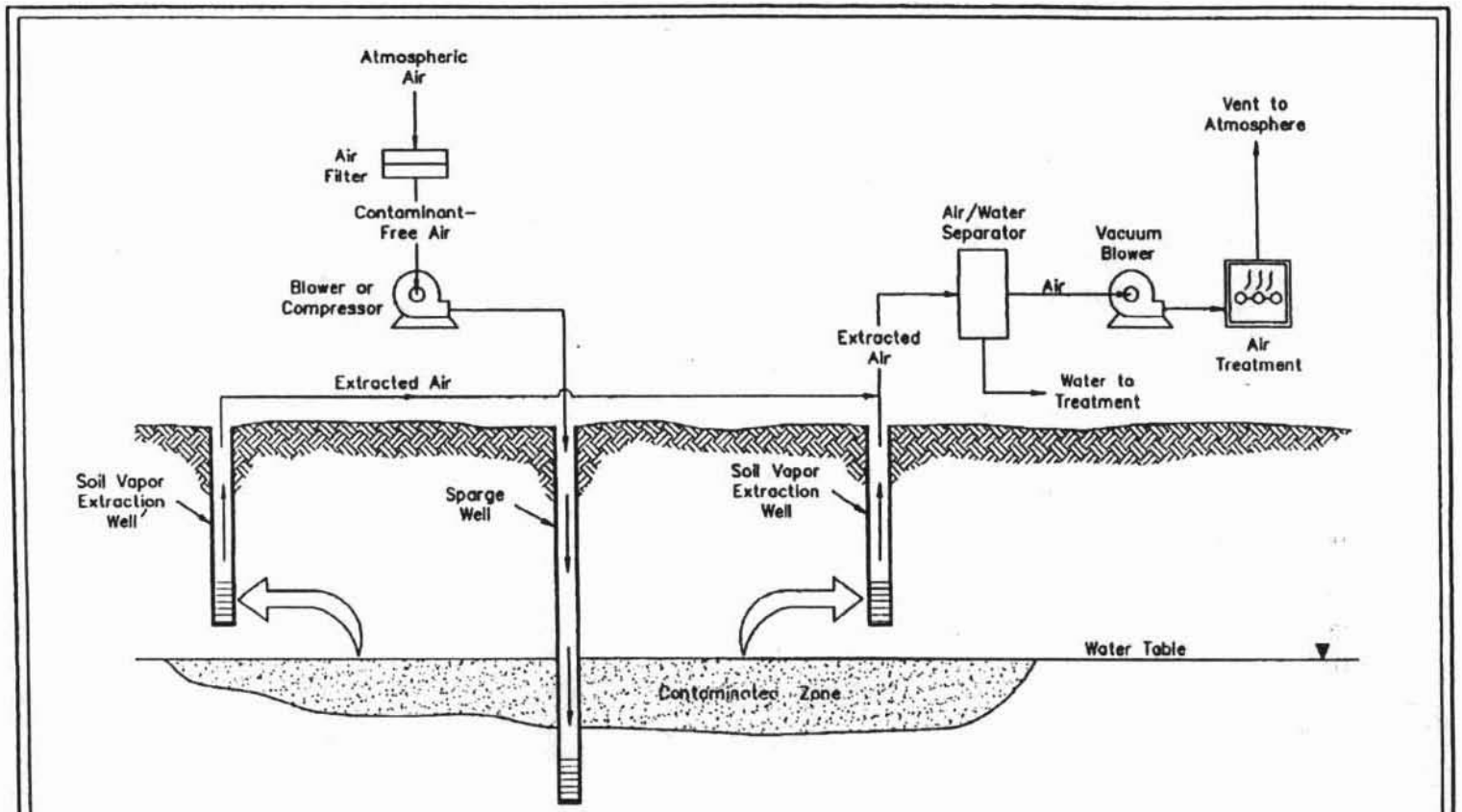

AIMW-11
PROPERTY BOUNDARY
SYLVESTER STREET
NEW YORK AVENUE
BROOKLYN AVENUE
#36
#33
#30
#31
TW-1
TGP-1
FLOOR DRAIN
OUT-OF-SERVICE CESSPOOL
STORM DRAIN
TGP-4
MDCW-1
NC-24
TGP-2
TGP-A
NC-11
TGP-3
11854
N11855
TGP-B
OLD COUNTRY ROAD
LEGEND
PROPOSED 2-INCH DIAMETER MULTI-DEPTH WELL CLUSTER
2-INCH DIAMETER MULTI-DEPTH WELL CLUSTER
EXISTING NCDH/USGS MONITORING WELL
GEOPROBE GROUNDWATER SAMPLE
2-INCH DIAMETER MONITORING WELL
AIR SPARGE POINTS WITH 20 FOOT RADIUS
SVE WELL WITH 40 FOOT RADIUS
* NOTE: ALL LOCATIONS ARE SUBJECT TO CHANGE BASED ON UNDERGROUND UTILITIES
0 30 60 90 120
Scale in Feet
N
CA RICH CONSULTANTS, INC.
Certified Ground-Water and Environmental Specialists
17 Dupont Street, Plainview, New York 11803
TITLE
REMEDIAL ALTERNATIVE 2 - SVE/AIR SPARGING
DATE 10/25/99
FIGURE 10
SCALE AS SHOWN
DRAWING NO. 1019-185FS1
30-36 NEW YORK AVENUE
31-33 BROOKLYN AVENUE
WESTBURY, NEW YORK
DRAWN BY S.T.M.
APPR. BY E.A.W.

FIGURE 3-1
TYPICAL AIR SPARGING ENHANCEMENT TO SOIL VAPOR EXTRACTION SYSTEM



TYPICAL AIR SPARGING ENHANCEMENT
TO SOIL VAPOR EXTRACTION SYSTEM

FIGURE
11.

TABLE 1

TISHCON CORPORATION

30-36 New York Avenue, 31-33 Brooklyn Avenue, 1-30-043 E

Historical Source Area Sampling

Location:	***On-Site***				
Designation:	**Storm Drain**	**Storm Drain**	**Exterior Floor Drain**	**Cesspool**	
Media:	Soil	Soil	Soil	Soil	
Date:	05/30/1991	08/23/96	08/23/96	07/19/95	
Sampler:	NCDH	Tishcon	NCDPW	Tishcon	***RCO***
Parameters					
All concentrations in parts per million (ppm)					
1,1 Dichloroethene	0.28	ND	ND	4,100	0.4
1,1 Dichloroethane	0.073	ND	0.37	130	0.2
1,1,1 Trichloroethane	21	1.4	0.49	170,000	0.8
Methlyne Chloride	0.06	ND	ND	ND	0.1
Perchloroethene	ND	ND	ND	ND	1.4

RCO - Recommended Cleanup Objective.

ND - Non-Detect

TABLE 2

TISHCON CORPORATION

1-30-043E

30-36 New York Avenue, 31-33 Brooklyn Avenue, 1-30-043 E

Historical Groundwater Sampling

Location:	***On-site***							
Designation:	**GW-1**	**GW-2**	**GW-3**	**GW-4**	**GW-5**	**GW-6**	**NC-24**	
Type:	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Well	
Media:	GW	GW	GW	GW	GW	GW	GW	
Date:	08/20/96	08/20/96	08/20/96	08/20/96	08/20/96	08/20/96	08/20/96	Groundwater
Sampler:	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Standard
Parameters								
All concentrations in parts per billion (ppb)								
Chloroethane	ND	ND	27	78	16	ND	370 E**	5
1,1 Dichloroethene	520 D	58	360 JD	620 JD	510 D	100	1,500 JD	5
1,1 Dichloroethane	510 D	29	550 JD	1,100 JD	550 D	44	7,500 D	5
1,2 Dichloroethane (total)	36	26	ND	3 J	4 J	17	10	5
1,2 Dichloroethane	7 J	ND	ND	ND	ND	ND	30	0.6
1,1,1 Trichloroethane	2,600 D	470 D	17,000 D	23,000 D	4,000 D	870 D	74,000 D	5
Trichloroethene	200	32	7 J	5 J	20	37	ND	5
1,1,2 Trichloroethane	9 J	ND	ND	ND	ND	ND	ND	5
Tetrachloroethene	86	130	13	18	38	120	5 J	5

ND - Non- Detect

J - estimated concentration (below reportable limits)

E - concentration above highes calibration standard in undiluted sample

D - sample analyzed at greater dilution

*** - Compound detected above highest calibration standard in undiluted sample, not detected at or above limit in diluted sample.*

TABLE 3A

TISHCON CORPORATION

30-36 New York Avenue, 31-33 Brooklyn Avenue, 1-30-043 E

Recent Groundwater Sampling

Location:	***On-Site***												
Designation:	**TGP-1**	**TGP-1**	**TGP-2**	**TGP-2**	**TGP-4**	**TGP-4**	**TGP-4**	**TW-1**	**MDC-1S**	**MDC-1I**	**MDC-1D**	**NC-24**	
Type:	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Geoprobe	Well	Well	Well	Well	Well	
Depth:	80'	95'	80'	95'	60'	80'	95'	51-63'	51-62'	72-82'	93-103'	51-65'	
Media:	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	
Date:	11/17/98	11/17/98	11/18/98	11/18/98	11/17/98	11/17/98	11/17/98	11/18/98	11/18/98	11/18/98	11/18/98	11/18/98	Groundwater
Sampler:	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Standard
Parameters													
All concentrations in parts per billion (ppb)													
Chloroethane	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	5
1,1 Dichloroethene	6.6	6.4	8.4	5.4	340	7.5	2.3	880	1,700 D	430	34	1,000 J	5
1,1 Dichloroethane	ND	2.9	9.8	10	560 D	14	5.3	580	2,800 D	620	44	1,200 J	5
1,2 Dichloroethane (total)	2.6	ND	9.8	1.7	ND	3.5	0.8 J	ND	ND	ND	ND	ND	5
1,2 Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6
1,1,1 Trichloroethane	24	42	39	110 D	3800 D	47	26	15,000 D	22,000 D	3700 D	910 D	13,000 DJ	5
Trichloroethene	1.1	ND	3	2.9	6.8 J	2.7	1.1	ND	ND	ND	ND	ND	5
1,1,2 Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Tetrachloroethene	14	ND	18	ND	ND	13	ND	ND	ND	ND	ND	ND	5

ND - Non- Detect

J - estimated concentration (below reportable limits)

D - sample analyzed at greater dilution

TABLE 3B

TISHCON CORPORATION

30-36 New York Avenue, 31-33 Brooklyn Avenue, 1-30-043 E

Recent Groundwater Sampling

Location:	***Off-Site***										
Designation:	**NC11854**	**NC11855**	**TGP-5**	**TGP-5**	**TGP-6**	**TGP-6**	**TGP-6**	**TGP-3**	**TGP-3**	**NC-11**	
Type:	Well	Well	Well	Well	Well	Well	Well	Geoprobe	Geoprobe	Well	
Depth:	50-60'	50-60'	60'	80'	60	80	95'	80'	95'	51-58'	
Media:	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	
Date:	6/9/99	6/9/99	6/9/99	6/9/99	6/9/99	6/9/99	6/9/99	11/18/98	11/18/98	11/18/98	Groundwater
Sampler:	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Tishcon	Standard
Parameters											
All concentrations in parts per billion (ppb)											
Chloroethane	ND	ND	ND	ND	ND	ND	ND	2.7	4.2	ND	5
1,1 Dichloroethene	1,700 D	430	2400 D	430 D	224	437	29 JD	29	33	5.5	5
1,1 Dichloroethane	2,800 D	620	2600 D	1700 D	206	309	32 JD	240 D	380 D	3.2	5
1,2 Dichloroethane (total)	ND	ND	ND	ND	ND	ND	7.2 ND	2.1	1.9	ND	5
1,2 Dichloroethane	ND	ND	ND	ND	ND	ND	ND	1.2	1.3	ND	0.6
1,1,1 Trichloroethane	22,000 D	3700 D	19800 D	2600 D	1340	2700	160 D	190 D	230 D	54 D	5
Trichloroethene	ND	ND	ND	ND	ND	ND	5.9 JD	3	1.2	ND	5
1,1,2 Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Tetrachloroethene	ND	ND	ND	35 JD	ND	ND	19 JD	ND	ND	ND	5

ND - Non- Detect

J - estimated concentration (below reportable limits)

D - sample analyzed at greater dilution

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Tishcon @ Brooklyn Avenue, Operable Unit 02 (Off-site Groundwater)
Record of Decision
Town of North Hempstead, Nassau County
Site No. 1-30-043 E

The Proposed Remedial Action Plan (PRAP) for the Tishcon @ Brooklyn Avenue site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repositories on January 6, 2000. This Plan outlines the preferred remedial measure proposed for the remediation of the off-site contaminated groundwater at the Tishcon @ Brooklyn Avenue site. The preferred remedy will utilize an Air Sparging/Soil Vapor Extraction system to volatilize and capture contaminants from the groundwater.

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

A public meeting was scheduled to be held on January 20, 2000; however due to severe winter weather the public meeting was rescheduled and conducted on February 3, 2000. The original public comment period was extended an additional two weeks to February 17, 2000. The public was notified of the rescheduled meeting by printed media, electronic media, and a notice to individuals and organization on the site mailing list. A discussion of the Focused Remedial Investigation/ Feasibility Study (FRI/FS) and the proposed remedy was conducted at the meeting. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site.

The public comment period for the PRAP began on January 6, 2000 and ended on February 17, 2000.

This Responsiveness Summary responds to all questions and comments raised at the February 3, 2000 public meeting.

The following are the comments received at the public meeting, with the NYSDEC's responses:

Comment 1. You have stated that groundwater in the New Cassel Industrial Area is contaminated. Is my family drinking contaminated groundwater?

Response 1. You are not drinking contaminated groundwater. The water that is delivered to consumers from the Town of Hempstead Department of Water is drawn from the aquifer at a depth in excess of five hundred feet below the ground surface, much deeper than the level at which the greatest levels of contamination are found (high levels of contamination are detected at depths of fifty to one hundred and twenty

feet below ground surface). The groundwater that is pumped from the aquifer is then treated by an air stripper followed by carbon filtration to remove any contaminants. The water is also tested at regular intervals to ensure that the water meets drinking water standards before it is distributed to consumers.

Comment 2. The term "present worth" has been used in the discussion of the costs of remediation. What does this term mean as used in these discussion?

Response 2. Present worth is the total of capital cost and operation and maintenance (O&M) cost in today's dollars. A five percent discount rate is used to calculate future O&M cost in today's dollars. Present worth is used to compare the relative costs of each alternative evaluated in the PRAP.

Comment 3. What is the groundwater standard for 1,1,1-TCA?

Response 3. The groundwater standard for 1,1,1-TCA is five (5) parts per billion (ppb).

Comment 4. Will the proposed remedy remediate the contaminated groundwater south of Old Country Road?

Response 4. The selected remedy is designed to address contaminated groundwater up to the border of the New Cassel Industrial Area (NCIA) and Old Country Road. The remaining groundwater south of this boundary will be addressed as part of the overall NCIA off-site groundwater. The remedial systems that are already in place will result in improved groundwater quality south of Old Country Road.

Comment 5. Do you have any results from the wells located south of Old Country Road?

Response 5. Results from wells south of Old Country Road are available. They will be presented in a comprehensive Remedial Investigation report in early Spring 2000. Early warning monitoring wells south of Old Country Road and upgradient of the Bowling Green Water supply wells are sampled on a quarterly basis as a precautionary measure. Recent results from the early warning monitoring wells screened at 500 feet below ground surface (approximately the depth at which the Bowling Green supply wells draw their water) show volatile organic contamination to be non-detect. This means the contaminants of concern are at concentrations below the level of detection (< 1 ppb), and well below the federal and New York State drinking water standards.

Comment 6. Will the confining layer beneath the site prevent the Soil Vapor Extraction (SVE) System from capturing the volatilized contaminants?

Response 6. The SVE design will have the wells screened above and below the confining layer. The wells screened below the confining layer are in place to capture the contaminants as they are volatilized by the Air Sparging (AS) system. The wells

screened above the confining layer are in place as a redundancy to capture any contaminants that escape the deeper wells and pass through the confining layer.

Comment 7: Has the State recovered any money from the PRPs for any of the state superfund monies spent in the investigation and cleanup of any of the New Cassel Industrial Area sites?

Response 7: The office of the Attorney General has negotiated a cost recovery settlement with the property owner of the Former LAKA site (Site No. 1-30-043 K) for $310,000. The consent decree was signed by the United States District's Judge (Eastern New York District) on December 30, 1999. This amount will reimburse the State for money spent on the Preliminary Site Assessment and Remedial Investigation/ Feasibility Study (RI/FS). In addition, this money will cover Former LAKA's portion of the New Cassel Industrial Area off-site groundwater RI/FS and the supplemental treatment system for the Bowling Green water supply wells.

Comment 8: The Proposed Remedial Action Plan indicates that groundwater samples will be collected from a total of six new wells installed as two clusters of three. We believe that the site can be adequately monitored through the use of three wells placed in one cluster of three.

Response 8: The monitoring wells installed as part of the remedial action are required to accurately monitor the effectiveness of the system. Two clusters of three wells will help to determine the system's vertical (how deep) and areal (how wide) effectiveness. One set of wells will not adequately define the areal effectiveness of the system. Data from these clusters will allow for a more accurate assessment of the system's performance and provide the information needed to determine when the system can be shut down.

APPENDIX B

Administrative Record

APPENDIX B

ADMINISTRATIVE RECORD

Arkwin Industries, Site Number: 1-30-043 D

Operable Unit No. 02 - Groundwater

1. Record of Decision, Tishcon @ Brooklyn Avenue Site, Operable Unit No. 02 - Groundwater, March 2000

2. Proposed Remedial Action Plan, NYSDEC, January 2000

3. Feasibility Study for Off-Site Groundwater, CA Rich Consultants, December 1999

4. Remedial Investigation for Groundwater, CA Rich Consultants, July 1999

5. Scope of Work for Additional Groundwater Sampling, letter, CA Rich Consultants, April 30, 1999

6. Record of Decision, Tishcon @ 30 - 36 New York Avenue and 31 - 33 Brooklyn Avenue, Operable Unit No. 01 - Source Removal, January 1998

7. Focused Remedial Investigation Work Plan, CA Rich Consultants, November 1997