U.S. ARMY CORPS OF ENGINEERS

SYLVANIA CORNING PLANT/FORMER SYLVANIA ELECTRIC PRODUCTS FACILITY (A.K.A. SYLCOR) SITE

in Hicksville

Town of Oyster Bay

Nassau County

New York

PRELIMINARY ASSESSMENT
FINAL

May 2005

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EXECUTIVE SUMMARY

1. The United States Army Corps of Engineers (USACE) conducted a Preliminary Assessment (PA) of the Sylvania Corning Plant/Former Sylvania Electric Products Facility (A.K.A. Sylcor) site (the Site) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) [42 U.S.C. 9601 et seq., as amended] and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) [40 CFR 300].

2. The purpose of this PA is to review readily available information to determine the need for further action by USACE, to ensure protection of human health and the environment.

3. The Site is a 10.5 acres area divided into three (3) separate but contiguous properties located at 70, 100 and 140 Cantiague Rock Road, Town of Oyster Bay, County of Nassau, State of New York, in the westernmost portion of Hicksville, Long Island, approximately thirty (30) miles east of lower Manhattan. The Site was operated from 1952 to 1967 for the research, development, and fabrication of nuclear elements (e.g., fuel elements, slugs) under Atomic Energy Commission (AEC), other Government, and commercial contracts. High temperature coatings, ceramics, and composite alloys for the space and aircraft industries were also fabricated on-site. The Site remained privately owned throughout its history.

4. The USACE has reviewed existing, readily available data on the Site. Based on that review, there is evidence of a release and/or threat of release into the environment of hazardous substances (specifically radioactive materials) resulting from work performed as part of the Nation's early atomic energy program that is not a federally permitted release. However, considerable licensed work took place on the Site involving radioactive materials similar to those used in non-licensed work under the 1293 and other AEC contracts. Although there is a reasonable likelihood that some of the contamination on the Site resulted from non-licensed work, geographic segregation of non-licensed and licensed activities was not sufficient to state definitely

the portions attributable to each. A more detailed analysis such as that in a CERCLA Remedial Investigation is recommended to determine which areas of the Site should be designated for FUSRAP cleanup.

While insufficient data currently exist to adequately define the extent of the risks, the possibility exists that further migration of contaminants related to the Nation’s early atomic energy program could occur. This migration may occur due to groundwater movement and/or the completion of groundwater, soil, or air exposure pathways, and may present a hazard to human health and the environment in the future.

There is also evidence of a release and/or threat of release into the environment of hazardous substances (chemicals) resulting from work performed at the Site. However, it cannot be determined at this time, based on available evidence, whether this release is attributable to the Nation’s early atomic energy program.

In accordance with FUSRAP and CERCLA, since there is an unpermitted release and/or threat of release of hazardous substance resulting from work performed as part of the Nation’s early atomic energy program, a FUSRAP response is appropriate and is recommended if other relevant criteria in ER 200-1-4 are met. Since significant data gaps exist regarding contamination extent in both soil and groundwater, additional investigation is recommended.

1.0 INTRODUCTION

The United States Army Corps of Engineers (USACE) conducted a Preliminary Assessment (PA) of the Sylvania Corning Plant/Former Sylvania Electric Products Facility (A.K.A. Sylcor) site (the Site) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) [42 U.S.C. 9601 et seq., as amended] and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) [40 CFR 300]. Also used as a reference for this PA was the Environmental Protection Agency (EPA)"Guidance for Performing Preliminary Assessments Under CERCLA" (EPA, 1991). The purpose of this PA is to review information to determine the need for further action by USACE, to ensure protection of human health and the environment.

In 1974, the Department of Energy (DOE) created the Formerly Utilized Sites Remedial Action Program (FUSRAP) to address sites used during the early atomic energy program that had residual contamination exceeding current regulatory limits. In the Energy and Water Development Appropriations Act, 1998 [Public Law 105-62, 111 Stat. 1320, 1326], Congress transferred responsibility for administration and execution of cleanup at eligible FUSRAP sites to USACE. In the Energy and Water Development Appropriations Act, 2000 [Public Law 106-60, 113 Stat. 483, 502], Congress mandated that FUSRAP response actions undertaken by the Secretary of the Army, acting through the Chief of Engineers, be subject to CERCLA and the NCP.

In March of 1999, USACE and DOE signed a Memorandum of Understanding (MOU) between the agencies for the purpose of delineating the responsibilities of each party relating to the administration and execution of the FUSRAP. Pursuant to that MOU, when a new site is considered for inclusion in the FUSRAP, DOE is responsible for performing historical research to determine if the site was used for activities that supported the Nation's early atomic energy program. If DOE concludes that the site was used for that purpose, the agency will provide USACE with a determination of eligibility for FUSRAP. USACE is then responsible for determining whether the eligible site should be designated for cleanup. To make that determination, USACE first prepares a PA in accordance with CERCLA and the NCP to determine if a response action is appropriate.

The purpose of a PA at eligible FUSRAP sites is to determine if there is an unpermitted release or threat of release, as those terms are defined in Section 101(22) of CERCLA, of a hazardous substance related to the Nation’s early atomic energy program at the site that may present a threat to the public health or the environment. If a PA determines that there is such a release or threat of release, that may present a threat to the public health or the environment, and the release resulted from work performed as part of the Nation’s early atomic energy program, a FUSRAP response action subject to CERCLA requirements is warranted. In such circumstances, the PA will recommend appropriate action to address the release or threat of release. If no such release or threat of release is found, the PA will recommend no further action.

The scope of USACE’s review during performance of the Sylcor PA included a site visit and a review of readily available Site information.

The Site, as it is referred to throughout the PA, was operated from 1952 to 1967 for the research, development, and fabrication of nuclear elements (e.g., fuel elements, slugs) under Atomic Energy Commission (AEC), other Government, and commercial contracts (USACE, 2004). High temperature coatings, ceramics, and composite alloys for the space and aircraft industries were also fabricated on-site (GTEOSI, 2003c). At all times throughout its history, the Site remained privately owned.

Previous investigations by the New York State Department of Environmental Conservation (NYSDEC) and the current property owner have identified uranium, thorium, nickel, chlorinated solvents, and to a lesser degree, volatiles (toluene, xylene, acetone, etc.) as Site contaminants. These contaminants, with the exception of volatiles, are also identified in the voluntary agreement between the NYSDEC and the current property owner. The Site is currently divided into three (3) separate but contiguous properties, each individually owned: the “70,” “100,” and “140” properties. GTE, a corporate predecessor to the Verizon entities (Verizon, Inc. and Verizon Communications, Inc.), current owner of the 140 and 70 properties, and lessee of the 100 property, entered into a voluntary cleanup agreement with the NYSDEC to remediate the soils at the Site to allow unrestricted future use of the Site. The voluntary cleanup included investigations (soil and groundwater) as well as remediation of soils at the Site. Relatively readily accessible, meaning not under buildings or below the water table, contaminated soils have been excavated and disposed off-site from cells 1-14 as shown on Figure 2. See Figure 7 for predicted excavation areas and estimated depths for the voluntary remediation.[1] Documentation provided in Attainment and Verification Reports from Verizon states that contaminated material remains in discrete locations within some of these cells. It was also observed during the voluntary remediation that contamination appears to extend beyond some of the cell walls in cells 9, 10, and 12 to areas under the 100 property building (Rushton, 2003). The USACE is not involved in this voluntary agreement. The Site is within NYSDEC’s Region 1 boundaries, and is listed by NYSDEC as Site No. V00089-1.

[1] Figures 4-7 were prepared prior to the voluntary remedial activities that were performed at the Site by the property owner and were based upon tests conducted prior to excavation. Voluntary remedial activities have occurred since Figures 4-7 were prepared and the actual voluntary remediation effort may have differed from what was predicted.

2.0 SITE LOCATION, CLIMATIC CONDITIONS, DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

2.1 Location

The Site is a 10.5 acres area divided into three (3) separate but contiguous properties located at 70, 100 and 140 Cantiague Rock Road, Town of Oyster Bay, County of Nassau, State of New York, in the westernmost portion of Hicksville, Long Island, approximately thirty (30) miles east of lower Manhattan. See Figure 1. The three (3) contiguous parcels are also known as Tax Map Section 11, Block 499, Lots 94, 99, and 100 (from south to north). Industrial and commercial properties are located directly north, south and west of the Site. Specifically, the Site is bordered on the north by the Nassau County Department of Public Works (NCDPW), on the south by General Instruments' (GI's) inactive hazardous waste disposal site, on the west by Cantiague Rock Road, and on the east by the golf driving range of Cantiague Park.

Generally, the Site is located in an industrial area of Hicksville. Across Cantiague Rock Road from the Site are a vocational technical school and other light industrial or commercial activities. The nearest residential area is northeast of the site, approximately one (1) block north. Regionally, the Site is located on a glacial outwash plain. Few surface water bodies are found near the Site.

2.2 Local Climatic Conditions

Long Island has a humid climate that is controlled primarily by the prevailing westerly winds, causing most weather systems to approach from the continental United States. Temperature extremes tend to be subdued by the proximity of the Atlantic Ocean (Isbister, 1966). Precipitation recharges Long Island's groundwater resource, or is lost through either direct runoff or evapotranspiration (Peterson, 1988). Annual precipitation averages about 43.87 inches. Average daily temperatures range from a low of 39.8°F in February to a high of 75°F in July. Average temperature and precipitation data for the area are collected at the National Climatic Data Center Mineola Cooperative.

2.3 Site Description

The Site consists of the 70, 100, and 140 Cantiague Rock Road properties. Individual buildings sit on each property, with the remaining lot areas either paved or covered with fill material. Contaminated material was excavated from some of the remaining lot areas and they were either paved or covered with fill material as a result of the recent voluntary remediation activities. The 140 property (4.0 acres) is occupied for the purpose of performing the voluntary remedial action; the 100 property (2.5 acres) is used as storage in support of the remedial action; and the 70 property (3.9 acres) is occupied by Air Techniques (a dental equipment manufacturing company). See Figure 2.

2.4 Operational History and Waste Characteristics

The privately owned Site was utilized for the manufacture of Government and commercial nuclear elements (e.g., cores, slugs, fuel elements) for reactors used in research and electric power generation between 1952 and 1967. There were two (2) separate reactor element-manufacturing processes at the Site. Contamination on the Site is mainly a result of commonly accepted waste disposal practices of the era in which operations occurred. Contaminated liquids were discharged to leach pools and sumps (Kingsley, 1959).

Also, scrap materials were burned in Building 8 and handling of this residue potentially contaminated Site soils (Davis, 1955).

2.4.1 Non-Licensed Work

Non-licensed work at the Site primarily occurred on the parcels of land at 100 and 140 Cantiague Rock Road. These two parcels comprise lots 99 and 100 (formerly single lot 80) and were referred to as Parcel N. Non-licensed government work was conducted under AEC Contract No. AT (30-1)-1293 (the “1293 contract”) in historical (i.e., now demolished) Buildings 1, 2, 3, 5, 6, 7, 8, 9, and 16. See Figure 2. Non-licensed work at the Site produced nuclear elements under the 1293 and other smaller contracts with the AEC using primarily non-worked uranium natural metal (i.e. derby)(Kingsley, 1959). Note that the contracts referred to as "other smaller contracts" may have been large contracts but the portion done at Hicksville was small. Uranium natural and thorium natural were used in the construction of and/or research related to these elements.

A typical process for the non-licensed work is summarized as follows:

1. Cast ingot or derby was cleaned by acid pickling and dried.
2. The cleaned ingot or derby was hydrided to UH3 under hydrogen at 450 degrees Fahrenheit.
3. The hydride powder was decomposed at 900 degrees Fahrenheit to uranium metal powder under vacuum or inert gas.
4. The metal powder was blended and cold pressed into compacts.
5. The compacts were hot pressed at 630 degrees Celsius under vacuum to a solid uranium slug of specification density.
6. The pressed slugs were cooled, then cleaned by acid pickling or surface grinding.
7. The ground slug was contour ground, and the end radii were machined.
8. The cleaned slugs were inspected and packed for shipment.

Available 1293 contract papers state that 2.6 million kilograms of uranium metal were handled for the 1293 contract operations. Documentation available from DOE reports indicates this number potentially could be as high as 6 million kilograms.

Later slug canning processes included nickel and aluminum plating (DOE, 1962). A procedure was evolved to solvent clean and acid clean bare metal before plating (Huber, 1955).

Sylvania's liquid effluents, except for sanitary sewers, flowed into a sump pond immediately behind Building 4. Samples of sump water were taken and the analytical results reported to management (SEP, 1963). Note on Figure 2 that sumps 1 and 2 are immediately adjacent to sump 4 and behind

Building 4. During operations for production as described above, the AEC authorized Sylvania to perform a study and develop a means for reducing nickel and uranium content in AEC fuel wastewaters. Results indicated that there could be no guarantee that any method would reduce nickel content below 0.05 mg/kg (Gieb, 1959).

In 1953, the AEC gave Sylvania Electric Products, Inc. (SEP) permission to use a portion of historical Building 2 on the 140 property for other than 1293 contract work (AEC, 1953). In 1965, when AEC element manufacturing ended, the AEC plant (the 1293 contract area) was decontaminated and released for other work by Isotopes, Inc., a contractor for the AEC, in conformity with the State of New York Industrial Code Rule number 38-29 (Giboney, 1973). Decontamination and final surveys were completed in December 1965. Decontamination addressed buildings and land areas. Limited soil excavation to a depth of four (4) inches was conducted in sump 3, sump 2 and the drum storage area between Buildings 6 and 7. Removed soil, concrete, and macadam were drummed and sent for off-site disposal (three hundred (300) tons in all).

In February 1966, the New York State Department of Labor (NYSDOL) informed SEP that the 1293 area was fit for use as other than a radiation installation. It is important to note that any sump still in use by SEP's licensed operations, including sump 1, was excluded from this clearance (Giboney, 1973). In May 1966, the AEC declared Buildings 1 and 2, and the surrounding grounds, fit for unconditional release (Giboney, 1973).

The NYSDOL conducted a survey of its own in January 1967 on Building 4, and areas of Building 2. This survey declared Building 4 fit for non-radioactive use, but it excluded sump 1 and three (3) rooms in Building 2 from this release until further analytical results were confirmed (Kleinfeld, 1967a). The sump and three (3) rooms in Building 2 were released shortly thereafter (Kleinfeld, 1967b). The historical Sylvania buildings on the 100 and 140 Cantiague Rock Road properties were demolished in 1967 (Unknown, 1996).

After completion of the soils decontamination efforts at the non-licensed operations area, five (5) samples were analyzed for uranium-238. Results ranged from 15-136 pCi/g with three (3) of the five (5) being greater than the current voluntary cleanup criteria. The mean value for U-238 residuals was 66 pCi/g. The AEC decontamination report identified difficulty in the decontamination of sump 3 due to the soft texture of the soil and the depth of the sump. A crane with bucket was utilized to remove top four (4) inches of material from the sump. However, personnel could not enter the sump (Bradley, 1966).

During the remediation efforts of the voluntary cleanup at the 100 property cell 11, three (3) underground storage tanks (UST) were discovered. The tanks were reportedly not used by GTE or during its predecessors’ former operations. GTE also reported no visible indications of any release from any of the three (3) tanks. After removal of the USTs, gamma scans indicated no residual radiological contamination above background levels present on the tanks. No analytical results above Site cleanup levels were available (GTEOSI, 2003d).

Later remediation activities on the 140 property in cell 2 of the voluntary cleanup unearthed a single tank of unknown age and use. The tank contained approximately 875 gallons of liquid and sludge. The sludge sample detected pH=12.6, 450 mg/kg of 1,1-dichloroethance, 11,000 mg/kg of total tetrachloroethene, 35 mg/L of TCLP tetrachloroethene, 1,690 ug/L of TCLP copper, 23,5000 pCi/g of uranium 234, 1,290 pCi/g of uranium 235, and 24,5000 pCi/g of uranium 238 as the primary detections. The liquid sample detected: pH=13.3, 35 mg/L of 1,1-dichloroethane, 38 mg/L of total tetrachloroethene, 5.1 mg/L of TCLP tetrachloroethene, 764 ug/L of TCLP copper, 231,000 pCi/L of uranium 234, 13,000 pCi/L of uranium 235, and 235,000 pCi/L of uranium 238 as the primary detections. After that tank was removed, the impacted soils beneath the tank were removed. The closure samples collected from the bottom of cell 2 after the soil excavation were within the cleanup objectives (Stewart, 2005b).

One (1) UST was discovered in cell 10 during the voluntary cleanup activities. This tank contained 400 gallons of liquid. “The concentration of U-238 in the liquid [was] 18,600 pCi/g [*sic*]. . . [,] U-235 [was] 910 pCi/g [*sic*]. . . . . The concentration of Th-232 in the liquid [was] 144 pCi/g [*sic*].” Results for chemical analysis were below the Site cleanup criteria set forth in the voluntary cleanup agreement. All tanks were shipped off site for disposal (URS, 2004b).

Also as part of these voluntary cleanup activities, drums and drum pieces were discovered in several remediation cells. These cells included 3, 4, 7, 9, 10, and 11 (Stewart, 2005b). Analytical results from two (2) drums in cell 3 were as follows: 1,640 pCi/g U-238, 1.15 pCi/g Th-232, 559 mg/kg PCE, and 38 mg/kg TCE (Hays, 2004).”

2.4.2 Licensed Work at the Site

Operations not under the 1293 AEC contract at the Site occurred primarily on the 70 Cantiague Rock Road parcel and produced many different kinds of fuel elements for different reactors. Natural, enriched, and depleted uranium were handled. With the sale of the Sylvania entities’ Nuclear Division assets, production of fuel elements and components ceased on June 10, 1966 (Rusinko, 1996).

The major steps of the commercial operations changed very little over the period of operations, but some modifications were made based on desired product. Examples of commercial work consist of the following:

1. Material was received, identified by a process number, and brought to the incoming vault storage area.
2. Accountability personnel entered the vault to remove raw material in order to made up charges. The charges were made up in the accountability room.
3. The material was then taken to the melt furnace area and placed in a vacuum induction furnace.

Criticality limits for this area were 2 kgs of U-235 per melt. Melting of enriched uranium-molybdenum and enriched uranium-aluminum in graphite and ceramic crucibles in vacuum melting furnace occurred.

4. Vacuum heat treating of uranium-molybdenum and depleted uranium in heat-treating furnaces occurred.
5. Sintering of uranium oxide-powdered stainless steel in hydrogen atmosphere sintering furnaces occurred.
6. Annealing of uranium oxide-stainless steel fuel plates and aluminum fuel plates in hydrogen atmosphere sintering furnace occurred.
7. Brazing of stainless steel and aluminum fuel elements in hydrogen atmosphere brazing furnaces occurred.
8. After the material is made into an ingot, it was taken to a heating furnace, heated, and then rolled to the proper dimensions. Rolling of uranium-stainless steel billets in hydrogen atmosphere rolling furnaces and rolling mills and uranium-aluminum fuel plates in air heating furnaces and hot and cold rolling mills occurred.
9. Swaging of clad and unclad uranium rods and pins occurred.
10. Sodium loading of uranium rod-stainless steel tubing involving argon gas and special furnaces, sodium metal dispenser and vacuum pumps occurred.
11. Iso-static pressing of uranium pellets-aluminum tubing involving argon gas in iso-static pressure vessel and compressor occurred.
12. Vacuum desiccators of uranium oxide-stainless steel powder compacts using vacuum and chemical desiccators and vacuum pumps occurred.
13. Chemical cleaning of all products involving hot and cold acid, caustic solvents solutions and vapors, water and demineralized water and anodizing and anodizing solutions using cleaning tanks, hoods, exhaust blowers, and vapor degreaser occurred. Inspection report from 27 February 1959 stated that degreasing “is done in an electrically heated perchlorethylene vapor degreaser. (Kingsley, 1959).
14. Compacting of uranium oxide-powdered stainless steel in hydraulic presses and dies occurred.
15. Pinch cores were made, and the piece was greased and taken to process storage. In the process

storage facility, the cores, the skull, the dross and scrap were placed on shelves, which were located on 18-inch centers.

16. The cores were then pressed into picture frames, taken to the heating furnace and rolled in a rolling mill. After rolling, the material was then brought back for in-plant storage.
17. Machining of uranium bearing alloys and non uranium-bearing fuel element plates, pins, assembled fuel elements and fuel element components using milling machines, lathes, and centerless grinders occurred.
18. Other operations that were then performed on the material consisted of cutting off and forming curvatures on the plates, acid cleaning, inspection, assembly of the elements, machining, and welding.
19. Finished elements were checked by Production control and further inspected both prior and after assembly.

Significant data gaps exist that do not allow for an accurate depiction of the amount of uranium metal handled for the licensed operations at Hicksville. Documentation regarding these operations has not been located to date. It also is not possible to determine the upper bound of materials handled because the available licenses did not always have limits specified.

Plant B water containing less than 0.5 gram uranium per liter was released. Sample results indicated that the highest concentration released to the inspection date was 0.025 gram per liter (Klevin, 1958).

Atcor, Inc began a survey and decontamination effort on Building 4 in November 1966. This survey effort concentrated on the building interior only (Swiger, 1967). The NYDOL conducted a survey of its own in January 1967 on Building 4, and areas of Building 2. This survey declared Building 4 fit for non-radioactive use, but it excluded sump 1 and three (3) rooms in Building 2 from this release until further analytical results were confirmed (Kleinfeld, 1967a). The sump and three (3) rooms in Building 2 were released shortly thereafter (Kleinfeld, 1967b). The AEC removed the Hicksville Site as a place of use on license SNM-82 in April 1967, based on this survey (Nussbaumer, 1967). The State of New York released the Site for non-radiological use based on AEC surveys, an Atcor survey, and its own investigation on September 19, 1967 and canceled the New York State Radioactive Materials License #325-0083 (Kleinfeld, 1967).

In 1967, when licensed element manufacturing ended, the licensed operations area was decontaminated, and free-released by NYSDOL. Later, in 1987, after the acquisition of Lot 103 (the eastern part of the 70 Cantiague Rock Road property) from Nassau County, buried drums and some contaminated soils were discovered on the current 70 Cantiague Rock Road property during construction of an addition to the former Sylvania Building 4 (Unknown, 1996). Drums were in various conditions, but samples from remaining materials indicated PCE, polychlorinated biphenyls (PCBs), arsenic, and TCE (ERM-Northeast, 1993).

Some of the elements produced by both the licensed and non-licensed work were coated with nickel to improve corrosion resistance and decrease oxidation and diffusion of uranium metal. Process wastes, which included PCE, a common industrial solvent used to degrease manufactured parts, were discharged to on-site sumps and leaching pools (Kingsley, 1959). See Figure 2.

3.0 PHYSICAL CONDITIONS

The Site is highly developed and is virtually void of vegetation due to this industrial development. Ornamental landscaping and weeds are the only vegetation on the Site. The regional geologic setting consists of unconsolidated geologic deposits overlying bedrock. The deposits are approximately 1,100 feet thick near the Site, thinner in the northwestern part of Nassau County and thicker southward. The deposits are divided into seven (7) surficial geologic units: two members of the Raritan Formation, the Magothy Formation, two distinct units of the Port Washington Deposit, the Port Washington Clay Unit, and the Upper Pleistocene Deposits (Isbister, 1966; Smolensky and Feldman, 1988).

Overburden beneath the Site consists of unconsolidated deposits. These deposits consist of residual or weathered bedrock, sand, silt, clay, and gravel of alluvial or glacial origin. Based on relatively recent Site boring logs, surficial deposits are fairly uniform, fine to coarse sands with little gravel. These deposits have been evaluated from the surface to two hundred twenty (220) feet below ground surface (bgs). Discrete lithological differences were not noted during field investigations. Depth to groundwater at the Site is 67-73 feet. Overburden (geologic deposit overlying bedrock) is approximately 1100 feet thick at this site (O’Brien & Gere Engineers, Inc., 2000).

The bedrock underlying Long Island is Precambrian to lower Paleozoic in age. The bedrock geology predominately consists of schist and gneiss with igneous intrusions. The bedrock is known to have some fractures. However, the fractures are not considered significant within the regional hydrogeology because of relatively low fracture permeability in comparison to the unconsolidated deposits.

Regionally, surface water in Nassau County consists of a few small streams, ponds, and marshes. Surface water collection is mainly controlled by precipitation rates, infiltration, runoff rates, and by perched water tables. Numerous perched ponds, marshes, and effluent streams occur north of the Ronkonkoma Moraine, which is north of the Site (Isbister, 1966).

Headwaters of the streams on Long Island tend to originate in the highlands of the Ronkonkoma and Harbor Hill Moraines. To the north, sediments tend to be impermeable tills that support perched water tables and receiving streams. To the south of the highlands, outwash plain deposits are usually very permeable and will not support a perched water table. Streams to the south of the Ronkonkoma Moraine tend to be losing and often disappear completely. Direct runoff from urban areas (pavement, rooftops) is re-routed by storm drainage systems to numerous recharge basins, which ultimately replenish the water table.

There are no sensitive environments as defined in 40 CFR 300, Appendix A, Table 4-23 present on the Site, or in the vicinity of the Site. Therefore, there is no potential for release to sensitive environments (Stewart, 2005a).

4.0 PATHWAYS

4.1 Soil and Air Pathways

Potentially contaminated material exists under Site buildings and in other subsurface areas. As stated previously in Section 1.0, GTE entered into a voluntary cleanup agreement with the NYSDEC to remediate the soils at the Site to allow unrestricted future use of the Site. To date, the voluntary remedial action addressed relatively readily accessible contaminated material (i.e., on-site material other than material under buildings). The building slabs and the backfill material placed in areas where the voluntary cleanup was conducted prevent direct contact with contaminated soils. Given this, the potential soil and air pathway receptors are minimal. Should construction activities such as removal of building slabs or excavations occur in the future, direct contact with contaminated material may be possible, thus completing the soils and air pathways.

Contaminant cleanup levels in soil (GTEOSI, 2003b) for the voluntary cleanup are as follows:

U-238	50 pCi/g
Th-232	2.8 pCi/g
PCE	1.82 mg/kg
TCE	0.7 mg/kg

Limited data exists on contaminant levels and depths under Site buildings, as well as potential exposures inside of buildings. The following characterization discussions include some data from under buildings and data that has since been addressed in the remediation, and are presented to identify potential contaminants of concern (COCs) and levels for areas not addressed by the voluntary remedial action to date. Use of these data to estimate COC levels remaining on-site is appropriate given that during the voluntary remediation, it was noted that some contaminated lenses of material extended beneath buildings. Additionally, not all contamination was removed from remediation areas due to various construction and engineering limitations.

Radiological Characterization

An August 20, 1996 Nuclear Regulatory Commission (NRC) inspection of the Site indicated two (2) soil samples with elevated U-238, and Th-232 levels. Maximum results were 2,613 and 46.6 pCi/g, respectively. The inspection report stated that the levels exceeded NRC criteria for unrestricted release. Results were confirmed by the NYSDEC (Bellamy, 1996a).

A December 2000 investigative report indicated Site contaminants were uranium and thorium in subsurface soils and groundwater. U-238 levels in soils as high as 1,190 pCi/g and Th-232 levels as high as 67 pCi/g were reported. (O'Brien & Gere Engineers, Inc., 2000).

During a March 2001 supplemental investigation, soil samples from borings on the three (3) properties exhibited above background concentrations for U-238 and Th-232. Maximum concentrations were 660 pCi/g and 57 pCi/g, respectively, on the 70 property. Maximum concentrations were 382 pCi/g and 69 pCi/g, respectively, on the 100 property. Maximum concentrations were 155 pCi/g and 5 pCi/g, respectively, on the 140 property. Borings in leach pool areas went to twenty (20) feet bgs. (GTEOSI, 2001).

Concentrations of uranium and thorium greater than the Site's voluntary agreement cleanup criteria were detected in some samples. Of three hundred six (306) samples taken in the fall of 2002, fifty-six (56) samples exceeded the U-238 voluntary cleanup criteria and twenty (20) samples exceeded the Th-232 voluntary cleanup criteria. The maximum U-238 result was 800 pCi/g (GTEOSI, 2003a).

Nine (9) of thirty-four (34) samples collected in a April 2003 additional borings investigation exceeded the voluntary cleanup criteria for U-238 and five (5) exceeded the Th-232 voluntary cleanup criteria. The maximum U-238 result was 459 pCi/g at eleven (11) feet bgs (GTEOSI, 2003b).

Background soil concentrations in the Hicksville area of U-238 and Th-232 range from non-detect to less than 1 pCi/g each (NYSDEC, 2003).

Cabrera Services surveyed the building on the 70 property in April 2003. Discrete elevated levels of radioactivity were identified in the building. A dose assessment was conducted to demonstrate that the levels were acceptable based on an industrial use scenario (Cabrera, 2003).

Site investigation data is summarized on Figure 5. NYSDEC reports that actual concentrations encountered during remediation were greater than those reported in investigation reports discussed above (Stewart, 2005b).

Chemical Characterization

The December 2000 investigative report indicated Site contaminants were PCE and trichloroethylene (TCE) in subsurface soils and groundwater. PCE concentrations as high as 18,000 mg/kg and TCE as high as 29 mg/kg were reported in soils. Above background metals (nickel) appear to be confined to depths greater than four (4) feet (O’Brien & Gere Engineers, Inc., 2000).

During the March 2001 supplemental investigation, soil samples from borings on the three (3) properties exhibited above background concentrations for PCE, TCE, and nickel. Maximum concentrations were 0.024 mg/kg, 0.001 mg/kg, and 3,980 mg/kg, respectively, on the 70 property. Maximum concentrations were 75 mg/kg, 3.4 mg/kg, and 20,100 mg/kg, respectively, on the 100 property. Maximum concentrations were 92 mg/kg, 0.17 mg/kg, and 384 mg/kg, respectively, on the 140 property. Borings in leach pool areas went to twenty (20) feet bgs (GTEOSI, 2001).

One hundred seventy-one (171) samples were analyzed for volatile organic compounds (VOCs) and Target Analyte List (TAL) metals during the fall 2002 soils investigation. Ten (10) samples contained PCE and three (3) samples contained TCE above Site voluntary cleanup criteria. PCE concentrations were as high as 540 mg/kg. No concentrations of nickel exceeded the voluntary cleanup criteria (maximum of 67 mg/kg). Low concentrations of toluene, xylene, acetone and other VOCs were detected (GTEOSI, 2003a).

Sampling during the fall 2002 effort concentrated on the eastern end of the 140 property, the southern and eastern sides of the 100 property, and the northern side of the 70 property. This sampling appeared to generally target former leach pools and sump areas.

Four (4) of the thirty-two (32) samples collected in the April 2003 additional borings investigation exceeded the voluntary cleanup criteria for PCE, and no samples exceeded the voluntary cleanup criteria for TCE. The maximum PCE concentration was 440 mg/kg. Two (2) samples were taken for disposal characterization purposes within previous elevated nickel areas. Total nickel concentrations ranged from 55 to 28,000 mg/kg and eleven (11) feet bgs (GTEOSI, 2003b). Site investigation data for VOCs, including TCE and PCE, as well as metals is included in Figures 4 and 6.

Based on the above data, there is evidence of an unpermitted release and/or threat of release into the soil or air of radioactive materials resulting from work performed as part of the Nation’s early atomic energy program. There is also evidence of a release and/or threat of release into the soil or air of chemicals resulting from work performed at the Site. However, it cannot be determined whether this release is attributable to the Nation’s early atomic energy program. These substances, both radioactive and chemical, may or may not have been remediated as part of Verizon’s voluntary cleanup program.

4.2 Surface Water Pathway

Surface water does not exist on or near the Site. The nearest surface water bodies are Meadowbrook Creek and Westbury Pond, which are greater than one (1) mile from the Site. The Site is located on a glacial outwash plain and at least four (4) on-site sumps (recharge basins) existed during the period of operations and were used to dispose of process wastewater. See Figure 2. Sumps, leach pools, and recharge basins have been used historically and remain as the primary means of handling liquid discharges and storm water run off in this area of Long Island.

Due to the Site distance from surface water and the use of recharge basins, no evidence of a release of hazardous substances, due to AEC-related radiological constituents or chemicals, to the surface water pathway has been found.

Based on the above data, there is no evidence of an unpermitted release and/or threat of release into the surface water of hazardous substances resulting from work performed as part of the Nation’s early atomic energy program (e.g., radioactive materials and chemicals).

4.3 Ground Water Pathway

The regional groundwater flow on Long Island is reportedly separated by a groundwater divide that trends east to west along the north central portion of Long Island. Groundwater north of the divide discharges to Long Island Sound and groundwater south of the divide discharges into Great South Bay (Kilburn, 1979).

Four (4) major aquifers exist within the unconsolidated deposits that underlie Nassau County. From deepest to most shallow, the aquifers are the Lloyd Aquifer, Port Washington Aquifer, Magothy Aquifer, and the Upper Glacial Aquifer. The Magothy Aquifer serves as the principal source of fresh water on Long Island. The aquifer is approximately 600 feet thick and lies about 85 feet bgs. Due to high concentrations of clays in the upper portions of the Magothy Aquifer, most public water supply wells are screened in the lower Magothy Aquifer. Hydraulic conductivity of the Magothy Aquifer averages 50 feet per day (O’Brien & Gere Engineers, Inc., 2000). The Upper Glacial Aquifer is the uppermost hydrogeologic unit on Long Island (Kilburn, 1979). The hydraulic conductivity of the upper glacial aquifer ranges from 130-270 feet per day.

The four aquifers are all hydraulically interconnected to varying degrees (O’Brien & Gere Engineers, Inc., 2000).

The Site is located on a glacial outwash plain. Overburden at the Site consists of unconsolidated deposits. Hydrogeological data collected from investigations on and adjacent to the Site have focused on the Upper Glacial Aquifer and the Magothy Aquifer. Test borings indicate that the Site is underlain by relatively simple stratigraphy consisting of gravelly sands overlying silty fine sands. On-site boring logs and related literature indicate that surficial deposits are primarily sand with some gravel, extending to approximately seventy (70) feet bgs (GTEOSI,

2003a). Depth to groundwater is approximately sixty-seven (67) to over seventy-three (73) feet (O'Brien & Gere Engineers, Inc., 2000). The water table at the Site is relatively flat. Groundwater elevations measured within monitoring wells on and adjacent to the Site varied by approximately 0.23 feet across the Site bgs. Groundwater flow beneath the Site is generally toward the south. Predominantly, the underlying groundwater at the Site is impacted with PCE and, to a lesser extent, with TCE. The December 2000 investigative report states maximum concentrations of PCE and TCE were detected in groundwater at 2,000 ug/L and 3 ug/L, respectively. Data on undated Site figures reports that maximum levels of PCE and TCE detected in on-site groundwater wells are 5,600 ug/L and 720 ug/L, respectively.

The underlying groundwater at the Site is also impacted with nickel and radiological contamination, but the NYSDEC has verbally indicated that this portion of the groundwater contamination may be localized and may not extend beyond the boundaries of the Site itself. The potential exists that this contamination could eventually extend beyond the Site boundaries. December 2000 maximum results for U-238 in groundwater were 220 pCi/L (field filtered) (O'Brien & Gere Engineers, Inc., 2000). The groundwater flow is generally to the south-southwest. A municipal well field is located just over a mile south of the Site. See Figure 3. The City of Hicksville has been monitoring and treating the water at this facility for VOCs and semi-volatile organic compounds (SVOCs). Information regarding public water supply wells in the vicinity of the Site is from the NYSDEC GI Site files. Five (5) public supply wells are within one (1) mile of the Site. Another fourteen (14) public supply wells are within two (2) miles of the site. See Figure 3.

Historically, industries on Long Island have utilized supply wells for process water. NYSDEC indicated during discussions that other industries in the vicinity of the

Site use groundwater in their processes. Information regarding supply wells in the vicinity of the Site is from the NYSDEC GI Site files. Reports have shown that twenty-six (26) supply wells existed within one (1) mile of the Site. NYSDEC reports that some of these wells may have been abandoned (Stewart, 2005b). See Figure 3.

There are two (2) public water supply wells just more than one half mile northeast (up gradient) from the Site. Sampling events conducted by the Hicksville Water District between June 1989 and August 1990 revealed elevated levels of 1,1-dichloroethane, 1,1,1-trichloroethane, and PCE in one (1) well. The other well showed that PCE exceeded the maximum contaminant level (MCL) for NYS drinking water (O'Brien & Gere Engineers, Inc., 2000). Additionally, four (4) wells on the NCDPW site directly north and adjacent to the 140 property were sampled by GTE. When tested for PCE and TCE, two (2) wells had no significant detections. PCE was detected in one (1) well at 2 ug/L. TCE was detected in two (2) wells at 15 ug/L and 1 ug/L. The data from these wells, public supply and Nassau County, is representative of groundwater conditions upgradient of the Site.

There is much evidence that, over the years, numerous businesses in the vicinity of the Site may have contributed to on- and off-site groundwater contamination from many different chemicals. There are nine (9) USEPA Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) sites within one (1) mile of the Site. An off-site PCE groundwater plume is present down gradient of the Site at GI's inactive hazardous waste disposal site, which is immediately adjacent on the south side of the Site. The chlorinated solvent contaminants from each site apparently commingle to some degree, and the exact contribution from each site to this groundwater plume has not been established. GI is operating a groundwater treatment operation to the south of its property.

A sentinel well has been placed between the GI groundwater treatment operation and the public water supply well. The intent of this well is to identify when the southern edge of any groundwater contamination reaches it, thus providing advance warning to the public water supply plant. NYSDEC reports that the sentinel wells were last sampled on 11 November 204. Results from the sampling event indicated the following levels of volatiles: The 325-foot deep well detected 5.4 ug/kg of cis 1,2-DCE, 3.6J ug/kg of PCE, and 54 ug/kg of TCE. The sample from 450-foot deep well detected 5.1 ug/kg of cis 1,2-DCE, 22 ug/kg of PCE and 23 ug/kg of TCE (Stewart, 2005b)."

The GI groundwater treatment operation as well as the treatment at the municipal well field reduces the potential impact of the groundwater exposure pathway. However, current data is insufficient to adequately characterize the extent of groundwater contamination and potential exposures.

Based on the above data, there is evidence of an unpermitted release and/or threat of release into the groundwater of radioactive materials resulting from work performed as part of the Nation's early atomic energy program. Voluntary cleanup actions by Verizon may or may not have eliminated the source of this groundwater contamination. There is also evidence of a release and/or threat of release into the groundwater of chemicals resulting from work performed at the Site. However, it cannot be determined whether this release is attributable to the Nation's early atomic energy program.

5.0 COMBINED PATHWAY CONCLUSION

Verizon's voluntary cleanup has addressed readily accessible contamination, thus limiting the soil and air exposure pathways. Limited data exist on contaminant levels and depths under Site buildings, as well as potential exposures inside of buildings. The data that are available, however, indicate that contamination remains in these areas. Completion of the soil and air pathway by such activities as removal of structures or other construction activities at the Site is possible. This presents a potential for a hazard to human health and the environment.

Due to the Site distance from surface water and the use of recharge basins, no evidence of a release of hazardous substances to the surface water pathway has been found.

The GI groundwater treatment operation as well as the treatment at the municipal well field reduces the potential impact of the groundwater exposure pathway. However, current data is insufficient to adequately characterize the extent of groundwater contamination and potential exposures. The potential for off-site receptor exposures via the groundwater pathway does exist.

Although data gaps limit assessment of exposures, a potential exists for exposure to current and future occupants of the Site and persons off-site to Site contaminants. Completion of groundwater, soil and/or air exposure pathways could present a hazard to human health and the environment.

6.0 SUMMARY AND CONCLUSIONS

The USACE has reviewed existing, readily available data on the Site. Based on that review, there is evidence of a release and/or threat of release into the environment of hazardous substances (specifically radioactive materials) resulting from work performed as part of the Nation’s early atomic energy program that is not a federally permitted release. However, considerable licensed work took place on the Site involving radioactive materials similar to those used in non-licensed work under the 1293 and other AEC contracts. Although there is a reasonable likelihood that some of the contamination on the Site resulted from non-licensed work, geographic segregation of non-licensed and licensed activities was not sufficient to state definitely the portions attributable to each. A more detailed analysis such as that in a CERCLA Remedial Investigation is recommended to determine which areas of the Site should be designated for FUSRAP cleanup.

While insufficient data currently exist to adequately define the extent of the risks, the possibility exists that further migration of contaminants related to the Nation’s early atomic energy program could occur. This migration may occur due to groundwater movement and/or the completion of groundwater, soil, or air exposure pathways, and may present a hazard to human health and the environment in the future.

There is also evidence of a release and/or threat of release into the environment of hazardous substances (chemicals) resulting from work performed at the Site. However, it cannot be determined at this time based on available evidence whether this release is attributable to the Nation’s early atomic energy program.

In accordance with FUSRAP and CERCLA, since there is an unpermitted release and/or threat of release of hazardous substance resulting from work performed as part of the Nation’s early atomic energy program, a FUSRAP response is appropriate and is recommended if other relevant criteria in ER 200-1-4 are met. Since significant data gaps exist regarding contamination extent in both soil and groundwater additional investigation is recommended.

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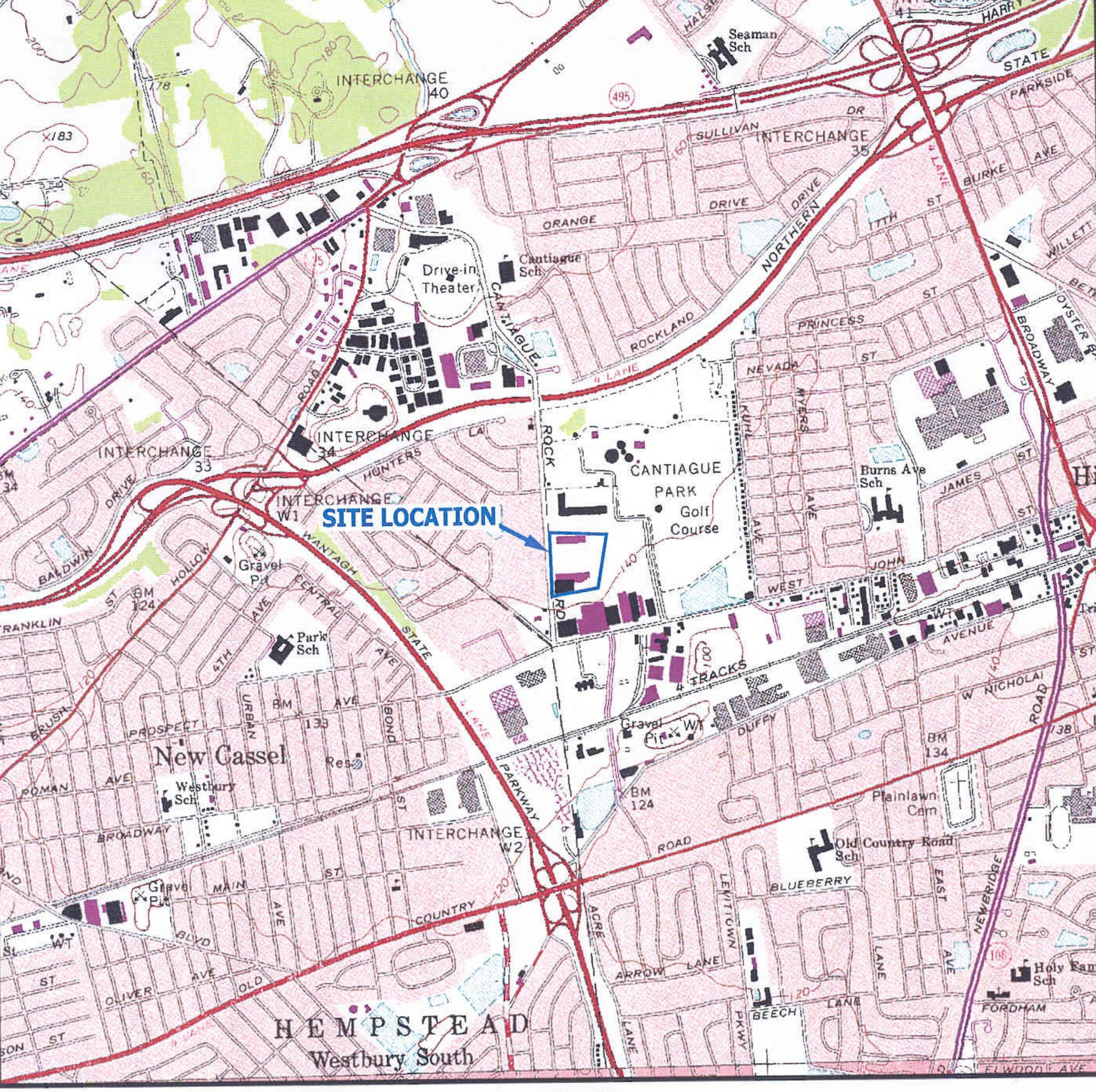
8.0 FIGURES



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1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

NORTH

MAP REFERENCE:

PORTION OF U.S.G.S. QUADRANGLE MAP
7 ½ MINUTE SERIES (TOPOGRAPHIC)
HICKSVILLE, NEW YORK 1967
PHOTOREVISED 1979

NYSDEC: V 00089-1; URS: 27010-039

QUADRANGLE LOCATION

Figure 1
Site Location

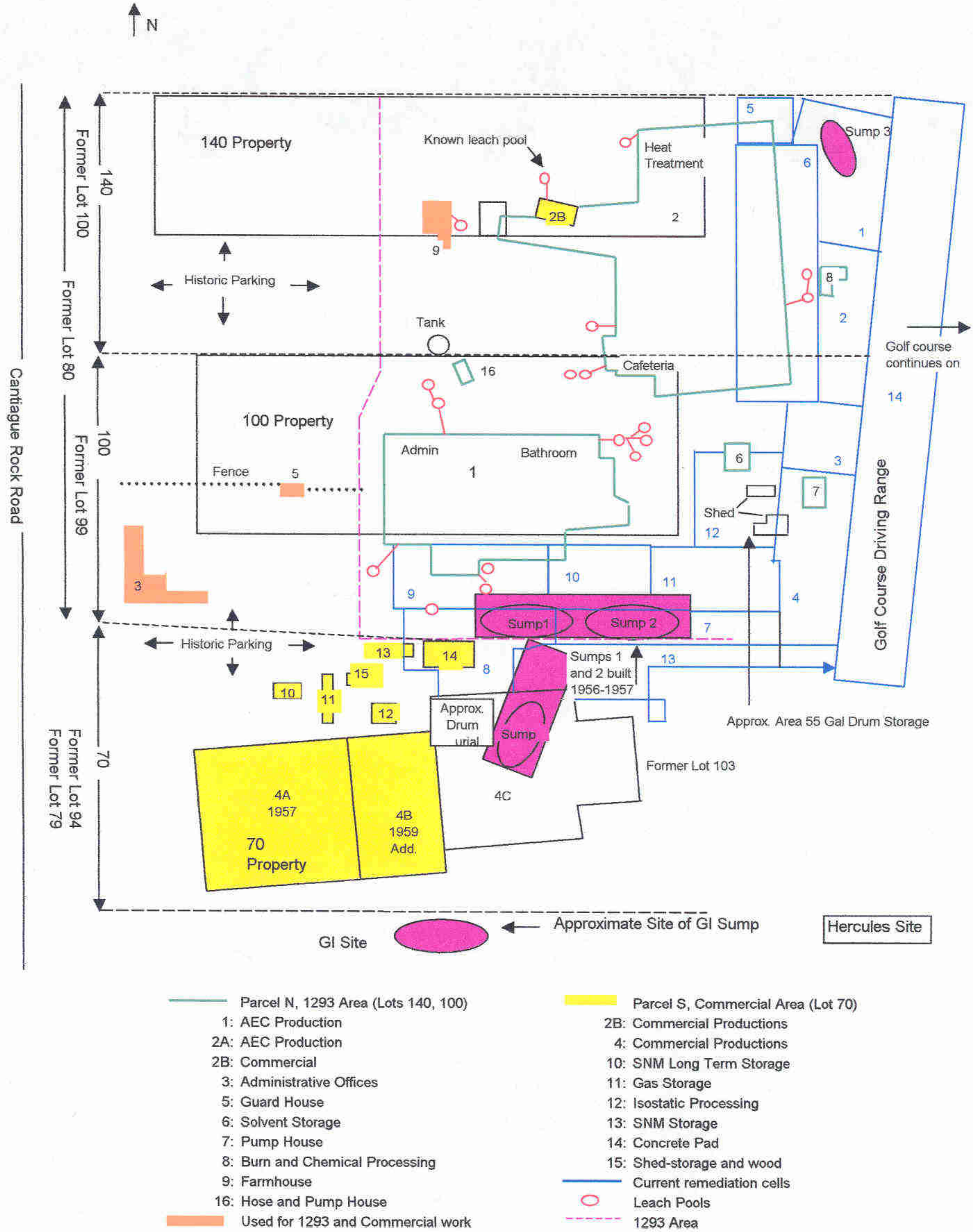

Figure 2
USACE Master Site Plan
Compiled from readily available data
24 November 2004

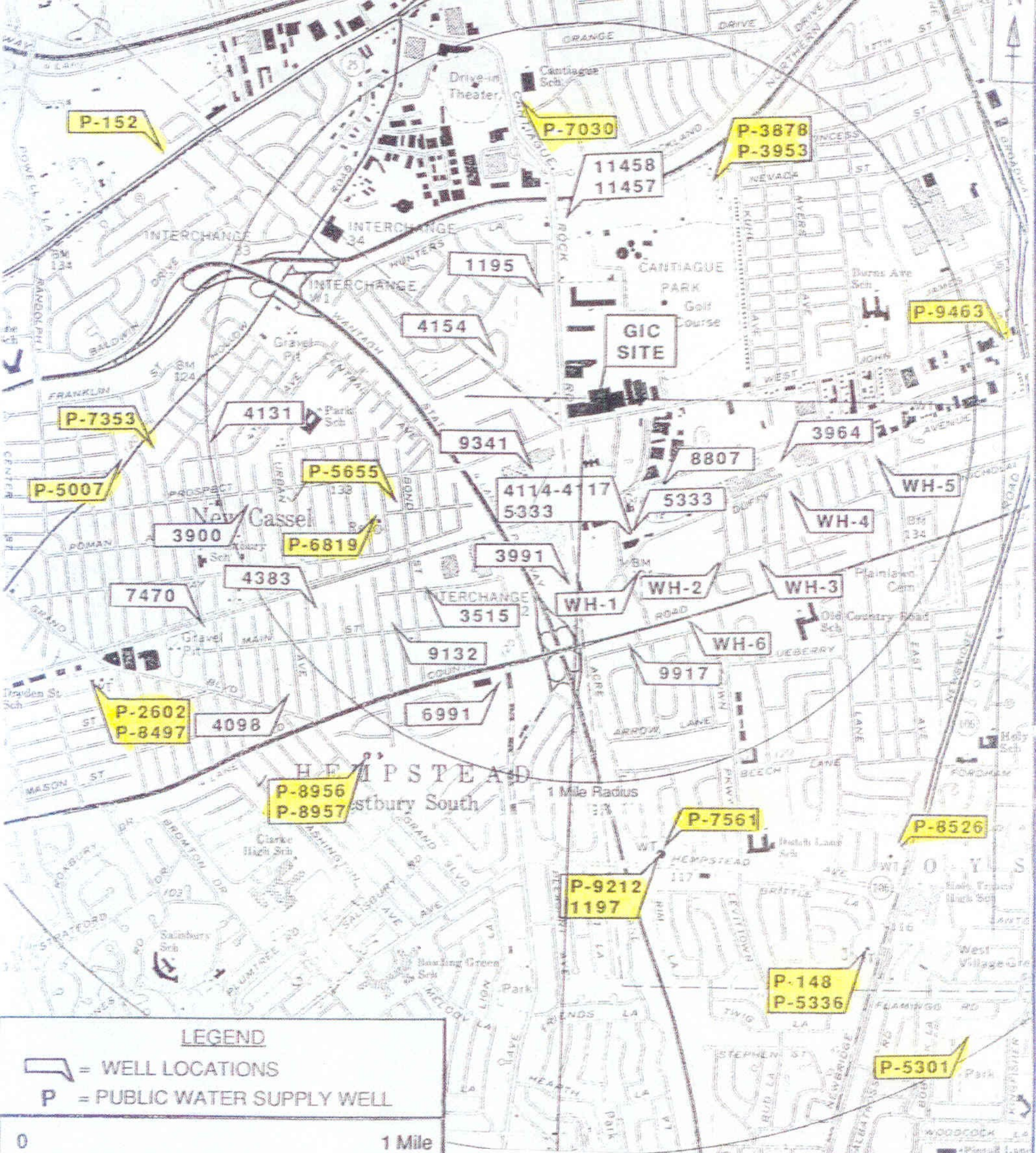

Figure 3
Known Industry and Public Supply Wells
Within 2 miles of the Sylcor Site
Hicksville, NY
(From NYSDEC GI Site Files)

Figure 4
Boring Locations and VOC Analytical Results

Borehole	Depth From (Ft)	Depth To (Ft)	Tetrachloroethene (mg/kg)	Trichloroethene (mg/kg)
SB-017A	2.5	3	9.4	29 J
SB-024	4	5	52	5.7 U
SB-024	5.5	7		2.4 J
SB-024	5.5	7	7900 J	
SB-047	9.67	11.33	36	
SB-049	12	13	7.8	
SB-054	8	10	22	
SB-064	8	9	17	
SB-067	6	7.33	170 J	
SB-106	4.5	6	18000	15
SB-111	0	4	18 D	
SB-118	0	4	4.2 D	
SB-119	0	4	16 D	
SB-120	4	8	92 DJ	
SB-121	0	4	9.2 DJ	
SB-124	0	4	14 D	
SB-125	0	4	9.6	
SB-127	0	4	18	
SB-134	0	4	2.5 D	
SB-166	8	12	75	3.4
U-064	5.5	6	5	
U-066	3	3	7.6 J	
U-074	4	4	72	2.6 U
U-074B	20	20	140	
U-094	10	10	12	
U-110	2.5	3	71	
U-114	15	15.5	540	
U-114	15.5	19	500	15 U
U-117	28	28	44	1.3 U
U-128	6	6.5	8.1	

Figure 8b
Boring Locations and VOC Analytical Results

Legend
- Borehole Locations
- Buildings
- Property Lines
- Area Outlines
- Predicted Excavation Extent
- Overlap Area Boundaries

Excavation Depth
- 2 feet
- 4 feet
- 8 feet
- 12 feet
- 16 feet
- 20 feet
- 24 feet

Feet
0 40 80

Projection Information
Stateplane Projection
Long Island Zone
North American Datum 1983
Feet

NYSDEC: V 00089-1
URS: 27010-030

GTE OPERATIONS SUPPORT INCORPORATED
HICKSVILLE, NEW YORK

ENVIROCON
DESTINY RESOURCES, INC.

DR ID: 1006.M0073
June 20, 2003

/hicksville_p2/gis/hick01/footprints/dec_voc_v2_e.mxd

Figure 5
Boring Locations and Radionuclide Analytical Results

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Borehole	Depth From (Ft)	Depth To (Ft)	Uranium 238 (pCi/g)	Thorium 232 (pCi/g)
SB-003	1	1.5	260 JI +/- 48	13 +/- 2.5
SB-004A	0.17	0.25	170 JI +/- 33	68 J +/- 13
SB-004A	0.33	0.42	43 JI +/- 9.4	
SB-004A	0.42	0.5	47 JI +/- 9.7	
SB-009	0	0.5		12 +/- 0.61
SB-009	0.5	1	2800 JI +/- 830	10000 +/- 2700
SB-009	1	2	120 JI +/- 22	17 +/- 2.9
SB-009	1	2	52 JI +/- 9.5	
SB-009	2	3	200 JI +/- 36	23 +/- 4.1
SB-009	3.83	4	1300 JI +/- 220	62 +/- 11
SB-009	6	8		6 +/- 1
SB-009B	1	2	720 JI +/- 130	22 +/- 3.8
SB-009D	0.5	1	190 JI +/- 33	
SB-009D	1	1.5	4400 JI +/- 800	4300 +/- 710
SB-009D	1.5	2	950 JI +/- 170	110 +/- 19
SB-009D	2	2.5	64 JI +/- 12	22 +/- 3.6
SB-009D	4	5	400 JI +/- 70	45 +/- 7.6
SB-009E	1	2	260 JI +/- 45	1.5 U +/- 3.9
SB-015	1	2	110 JI +/- 19	4.4 +/- 0.77
SB-015	4	5.5		4.4 +/- 0.79
SB-015	13.25	14.5	220 JI +/- 4.5	
SB-017A	4	4.5	62 JI +/- 11	
SB-017A	4.5	5	470 JI +/- 82	
SB-017B	2	4	51 JI +/- 8.9	
SB-017B	12	16.33		5.4 +/- 0.93
SB-023B	9	10	970 JI +/- 170	18 +/- 3
SB-024	5.5	7	4600 JI +/- 810	330 J +/- 59
SB-024	10	11	290 JI +/- 50	
SB-025	0	1.5	250 JI +/- 44	
SB-030	0	2	220 JI +/- 38	
SB-037	1	2		7.4 J +/- 3.4
SB-038	0	1.5	75 JI +/- 13	2.9 +/- 0.54
SB-040	0	2		5.5 J +/- 2.2
SB-041	1	1.5		24 +/- 4.3
SB-045	6	6.5	23000 JI +/- 4000	120 +/- 21
SB-049	12	13		9.9 +/- 2
SB-064	1.5	2	80 JI +/- 14	4 +/- 0.72
SB-066	1.5	2.5	[illegible] +/- 22	
SB-071	5.5	6	300 JI +/- 64	12 J +/- 2.1
SB-076	4	5.33	59 JI +/- 11	
SB-077	10.5	11	260 JI +/- 45	15 +/- 2.8
SB-078	10.5	11.5	61 JI +/- 11	
SB-079	6	6.17	470 JI +/- 82	18 +/- 3.1
SB-082	2	2.5	230 JI +/- 40	6.4 +/- 1.1
SB-105	2.5	3.33	180 JI +/- 32	
SB-105	4.5	5	6000 JI +/- 1100	4 +/- 1.4
SB-105	5.63	6.33	1400 JI +/- 240	
SB-106	5	6	46 JI +/- 8.3	
SB-107	7	8	44 JI +/- 8	
SB-111	0	2	82 JI +/- 25	4.7 +/- 0.59
SB-112	2	3	120 JI +/- 29	3 +/- 0.53
SB-113	13.5	14	450 JI +/- 85	69 J +/- 12
SB-113C	12	16	130 JI +/- 30	7 +/- 0.73
SB-119	12	16	220 JI +/- 43	
SB-120	12	16		5.1 J +/- 1.1
SB-129	2	2.17	41 JI +/- 18	
SB-129	2	3	71 JI +/- 16	
SB-133	0	4	110 JI +/- 24	
SB-136	0	4	130 JI +/- 27	
SB-145	12	16.33	2200 JI +/- 400	9.6 +/- 0.94
SB-151	1	1		30 J +/- 5.4
SB-152	8	14	120 JI +/- 27	12 +/- 0.90
SB-153	0.5	2	92 JI +/- 21	4.2 J +/- 0.41
SB-163	0	4	470 JI +/- 89	56 J +/- 10
SB-166	8	12	310 JI +/- 64	6.9 +/- 1.6
SB-169	12	16	120 JI +/- 25	
U-002	0	2	54 +/- 18	13.7 +/- 3.7
U-005A	1	1.5	153 J +/- 33	6.4 +/- 1.3
U-007	0.5	1.5	69 +/- 17	
U-012	2	3	83 J +/- 18	4.78 +/- 0.97
U-013	1.5	2.5	107 J +/- 38	
U-014	1.5	2.5	103 +/- 31	
U-016A	3.5	6.5	73 +/- 18	2.98 +/- 0.94
U-017	7	8	115 J +/- 22	
U-019	2	3.5	95 J +/- 18	11.7 J +/- 2.5
U-020	2.5	3	68 J +/- 14	
U-021	1.5	2	65 +/- 16	
U-024	2.5	3	43 +/- 14	
U-026	3	4	212 +/- 34	8.8 +/- 2.4
U-027	2	2.5	358 +/- 57	
U-031	11.5	11.5	66 +/- 18	
U-032	2.5	3	71 J +/- 15	3.47 +/- 0.71
U-033	1.5	2.5	90 +/- 20	
U-034	3	3.5	172 +/- 28	
U-034	3	3.5	262 J +/- 50	
U-037	3	3.5	591 +/- 79	
U-039	1.5	1.5	58 J +/- 12	
U-041	2.5	3	44 +/- 13	
U-042	1	2	112 J +/- 22	21.9 J +/- 4.4
U-042	14	16	46.4 J +/- 9.2	
U-043	2.5	3	296 +/- 43	2.94 +/- 0.99
U-046	2.5	3	800 +/- 100	4.59 +/- 0.99
U-046	2.5	3	720 J +/- 140	
U-048A	0.5	1	41 +/- 25	
U-054	2.5	3.5	148 +/- 28	6 +/- 1.7
U-058	0.5	1.5	163 J +/- 35	7.9 +/- 1.6
U-059	1.5	2.5		0 +/- 1.2
U-061	0.5	1.5	199 +/- 31	4.94 +/- 0.97
U-061	0.5	1.5	254 J +/- 51	
U-062	1	1.5	101 +/- 20	
U-065B	2.5	3		3.9 +/- 1.2
U-067	2	2.5	542 +/- 72	
U-067	2	2.5	630 J +/- 120	
U-068	2	3	283 +/- 43	
U-075A	7	7.5	75 J +/- 15	43 +/- 11
U-075A	7	7.5		50 +/- 9.4
U-075B	2.5	3	42 +/- 18	24 +/- 6.4
U-075B	6.5	7		5 +/- 1.4
U-077	2.5	3	48 +/- 13	
U-078	2.5	3.5	202 +/- 37	
U-079C	3	3.5	99 +/- 22	
U-082	1.5	2	52.5 J +/- 9.8	
U-083	2.5	3	90 J +/- 17	
U-085	2.5	3	73 +/- 23	
U-087	2.5	3	230 J +/- 44	
U-091	2.5	3	119 J +/- 27	2.58 +/- 0.66
U-093	1	2.5	75 J +/- 14	
U-095	2.5	3.5	124 J +/- 24	
U-099	11	11.5	94 J +/- 19	
U-100B	3.5	4	43 +/- 13	
U-103	2	2.5	54 +/- 15	
U-104	1	1.5	50 +/- 14	
U-105	1	1.5	75 J +/- 15	
U-109	2	2.5	39 +/- 17	
U-110	1	1.5	77 J +/- 15	3.89 J +/- 0.77
U-114	1.5	4	243 J +/- 47	4.5 J +/- 1.1
U-114	6	7	540 J +/- 110	11.6 J +/- 2.6
U-115	2	3	121 J +/- 24	
U-117	1	2.5	102 J +/- 20	
U-118	7	8	50 +/- 13	
U-125	3	3.5		2.8 +/- 1.2
U-132	12	13	258 J +/- 54	
U-132	13	13.5	680 J +/- 150	
U-135	7	8	40 +/- 13	

Figure 9b
Boring Locations and Radionuclide Analytical Results

Legend

- Borehole Locations
- Buildings
- Property Lines
- Area Outlines
- Overlap Area Boundaries
- Predicted Excavation Extent

Excavation Depth

- 2 feet
- 4 feet
- 8 feet
- 12 feet
- 16 feet
- 20 feet
- 24 feet

N

Feet
0 40 80

Projection Information
Stateplane Projection
Long Island Zone
North American Datum 1983
Feet

NYSDEC V 00089-1

URS: 27010-002

GTE OPERATIONS SUPPORT INCORPORATED
HICKSVILLE, NEW YORK

ENVIROCON

DESTINY RESOURCES, INC.

DRI: ID: 1006.M0074

June 20, 2003

Figure 6
Boring Locations and Metals (Nickel) Analytical Results

/hicksville_p2/gis/hick01/footprints/dec_nickel_v2_e.mxd

Borehole	Depth From (Ft)	Depth To (Ft)	Nickel (mg/kg)
SB-015	13.25	14.5	685
SB-071	12	13.3	1820
SB-079	12	13	1530
SB-081	14.5	15.5	1850
SB-105	4.5	6	978
SB-145	0	6	910
SB-153	0.5	2	1780
SB-166	6	12	20100 D

Figure 7

Predicted Excavation Depths - All Analytes

/hicksville_p2/gis/hick01/footprints/dec_site_v2.mxd