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Volume I

Final Phase II RI Report

Remedial Investigation/Feasibility Study

Korkay Inc.

Village Of Broadalbin, New York

Site Number 5-18-014
Work Assignment #D002925-3

Prepared for:

New York State
Department Of Environmental Conservation
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Section 1
Introduction and Scope

1.1 Project Background

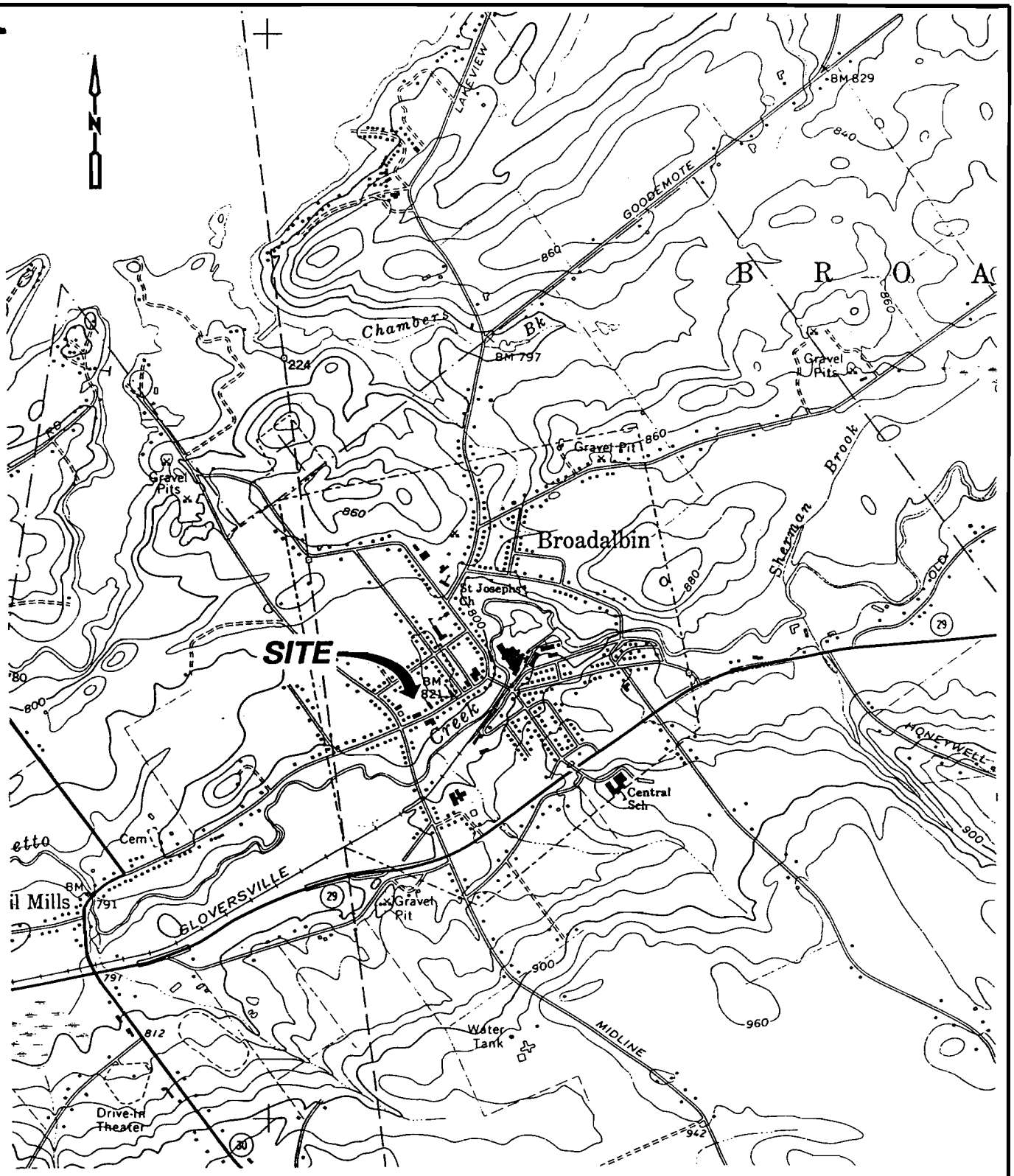
Based on the results of the Phase I Remedial Investigation conducted at the Korkay Inc. site, located in the Village of Broadalbin, Fulton County, New York, the New York State Department of Environmental Conservation (DEC)-Division of Hazardous Waste Remediation authorized CDM to conduct Phase II Remedial Investigation (RI) activities at this site. The purpose for conducting additional field investigations is to supplement the data that had been collected during the Phase I RI for Feasibility Study completion. The Phase I RI field work was conducted by CDM in September and October 1993, and the final Phase I RI report was issued in April 1994. The Phase II RI field work was conducted by CDM from October 3 through 28, 1994.

The Korkay Inc. site is a one acre parcel of land at 70 West Main Street, in the Village of Broadalbin, Fulton County, New York (see Figure 1-1, Location Map, and Figure 1-2, Site Map). The area is a mix of residential and commercial properties.

From 1887 to 1964, the property was owned by the Crosley Glove Company, which was a leather manufacturer. Following this period, Korkay Inc. (also referred to as Perma Glaze by DEC) operated as a chemical supply company which bought and stored bulk chemicals from other major chemical companies and blended these chemicals (detergents, solvents, etc.) into products such as car waxes, spray cleaners, and hand cleaners. It appears that the Korkay/Perma Glaze operations at the site ceased sometime in 1988.

Korkay obtained used barrels in which some of their final products were packaged. The used barrels were stored on-site between 1969 and 1980. Korkay washed and relined the used barrels on site. The barrel washwater and washwater from spill cleanups and vat cleaning, were discharged to the septic system on site. The previous contents of the used barrels used by Korkay were never determined. Some barrels were suspected to have contained acetone, isopropyl alcohol, degreasers, perfumes, and other chemicals.

In August 1979, personnel from the New York State Department of Health (NYSDOH) and the DEC regional offices performed a site inspection at the Korkay site. This inspection was in response to a complaint by the neighbor located north of the site, who complained that trees and vegetation on his property were dead or dying due to chemical run-off from the Korkay barrel washing area. This neighbor also indicated that the run-off also affected the resident's garden located to the west of the site.



Source of map: Broadalbin, NY Quadrangle, USGS

Figure 1-1

Location Map

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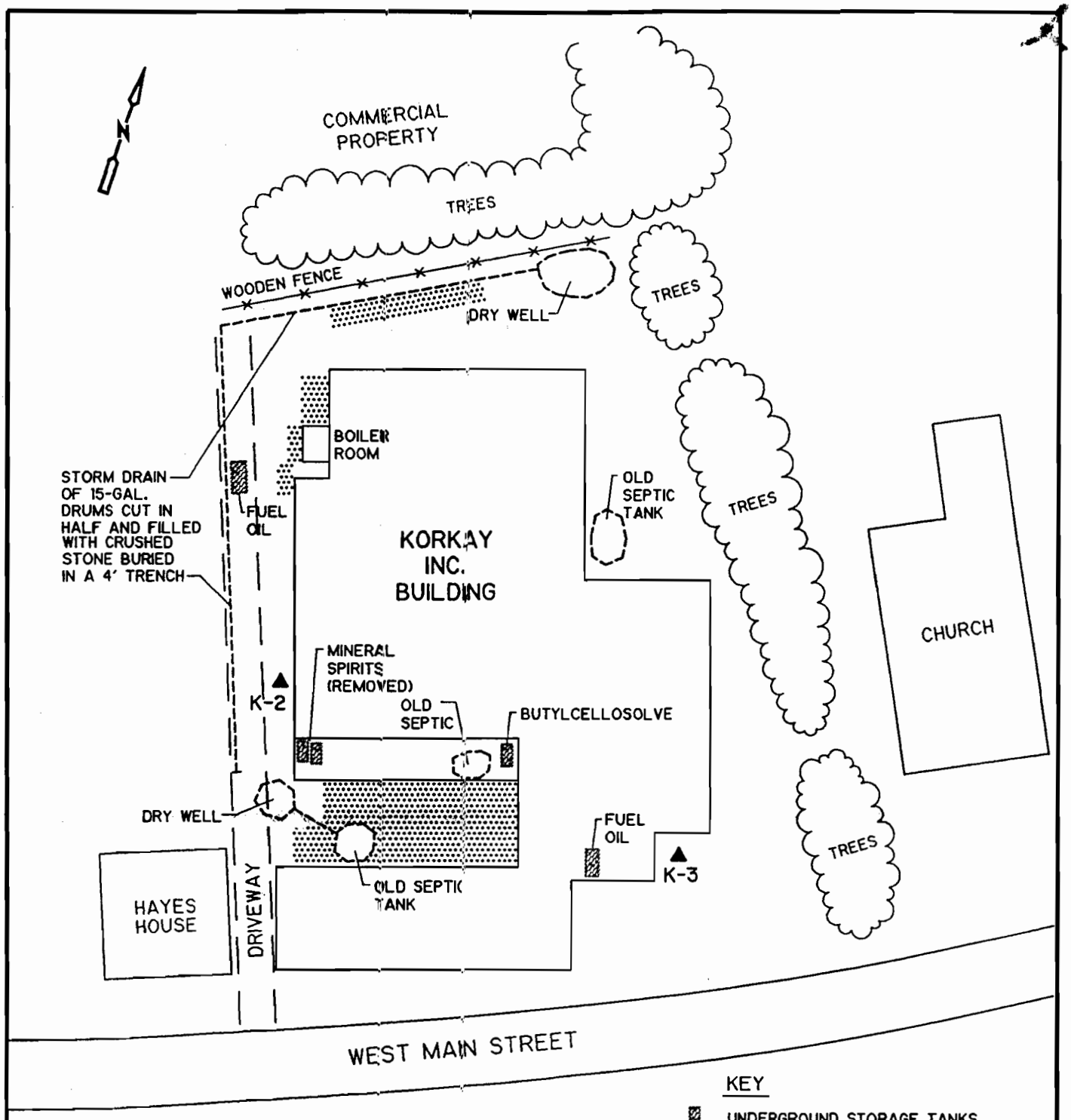
Korkay Inc. Site - Broadalbin, New York
NYSDEC Site #5-18-014



Source of base map: EA Phase II Investigation Report. April 1988

Not to Scale.

Figure 1-2

Site Map

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Korkay Inc. Site - Broadalbin, New York
NYSDEC Site #5-18-014

During the 1979 inspection, roughly 100 to 200 barrels were observed to be stored outdoors. Liquids, described as red or pink and white color, from the stored barrels was observed to be leaking onto the ground creating puddles of unknown chemicals.

A more detailed history of the site is presented in the Final RI Report (CDM, April 1994) which was submitted previously by CDM to DEC.

1.2 Geologic Setting

As discussed in the April 1994 Final RI Report, the limited geologic information published for the Broadalbin, New York area suggests overburden material consists of the poorly sorted units of glacial origin, including fine to medium grained sand, silty clay, sand and gravel, and till. Drift till is poorly sorted while outwash Kame deposits are well sorted because they were deposited by water. These were present in the soil borings installed at the site by CDM in 1993.

More specifically, the shallower soil is characterized as a fine to medium-grained sand unit grading to a silty clay unit. An extensive silty clay unit interbedded with lenses of clayey silt, silt, and sand was encountered at depths ranging from approximately 9.5 feet to 42 feet. Underlying the silty clay unit is a thin sand and gravel unit that overlies a dense silt till unit. The dense silt till unit was initially encountered at depths ranging from approximately 34 to 54 feet below the surface grade. [A silt, trace gravel unit was encountered instead of the till unit in the area of MW-7D.] These glacial deposits are reported to be underlain by dolomite bedrock of the Cambrian Age Little Falls Formation.

Based on Phase I RI work, the uppermost water bearing unit was encountered in the unconsolidated overburden at a depth of 7.5 to 8 feet below the surface grade. The first water bearing unit below the aquitard (the silty clay), was generally encountered at depths ranging from 30+ feet to 40+ feet below the surface grade throughout the site in the borings installed by CDM.

Based on water levels obtained during groundwater sampling, contour maps of the potentiometric surface were constructed for the two water bearing units. The flow direction of the uppermost water bearing unit is in the southerly direction. The data suggests that groundwater flow in the first water bearing unit encountered below the aquitard is generally easterly in this zone.

1.3 Previous Investigations

In August 1983, DEC initiated a Preliminary Site Assessment (PSA). Several reports were prepared for DEC during the PSA (hazard ranking) phase by EA Science and Technology

(EA). The Preliminary Site Assessment Phase II study field work was conducted by EA and commenced in November 1985.

Further details of the preliminary studies conducted are presented in the Final RI Report (CDM, April 1994) and existing EA reports that were submitted previously to DEC.

1.4 Scope of Phase I Investigation

The Phase I RI provided an initial determination regarding the nature and extent of soil and groundwater contamination resulting from past activities conducted at the site and assessed whether the identified contaminants pose an unacceptable current or potential risk to human health. A final Phase I RI Report and Risk Assessment Report was approved by DEC on May 24, 1994.

The Phase I RI for the Korkay, Inc. site consisted of two major field activities. These activities included soil sampling and groundwater monitoring well installation and sampling.

The major objectives of the first phase RI included characterizing the nature of the contaminants present at the site and determining the need for further investigative actions. The first phase RI characterized those areas of the site that do not require additional study and those areas of the site that require further study under this subsequent investigative phase (Phase II), and provided data to determine the risks to public health posed by contaminants from this site. The data obtained from the remedial investigations will be used to develop appropriate remedial alternatives.

To characterize the nature, degree, and extent of soil contamination, surficial and subsurface soil samples were collected at on-site and off-site locations, including areas where contamination may have migrated to the adjacent property located to the west of the site. The first phase RI sampling plan was prepared in consideration of available site information that described observed leakage to the ground from stored drums and discharge to the on-site septic system from varied sources such as barrel wash water, vat cleaning residuals and spill cleanups.

To characterize the nature, degree, and extent of contamination within the uppermost water bearing unit and the first water bearing unit encountered below the aquitard underlying the site, and to characterize the site-specific stratigraphy and probable hydraulic vertical gradient of the water bearing units within the study area, seven new groundwater monitoring wells were installed. The seven newly installed wells, two existing wells, and an adjacent property owner's well (non-supply) were sampled for chemical analysis.

A third field activity included sampling of the contents of existing drums and above-/underground tanks at the site. An independent contractor to the DEC's Bureau of

Construction Services had undertaken the drum and tank sampling activity the site. The DEC had determined out of the remaining drums, above-/underground tanks, and septic tanks sampled, four of the drums contained substances that were considered hazardous waste, and were subsequently removed from the site by the DEC. The other drums and tanks remain at the site.

1.5 Scope of Phase II Investigation

Phase II RI field work, conducted in October 1994, included supplemental sampling to obtain necessary data for further evaluation of site characteristics to aid in the development of remedial action alternatives.

The field work associated with the Phase II RI included supplemental soil sampling and supplemental groundwater monitoring well sampling. In addition, slug testing of two shallow wells, groundwater field screening of the shallow water-bearing unit by "Hydropunch" methods, surface water and sediment sampling in Kennyetto Creek, abbreviated reconnaissance of the building interior, and soil vapor extraction/combined air sparging vapor extraction (SVE/CASVE) 5-day treatability testing were performed as part of the Phase II RI.

The objectives of Phase II RI soil sampling were to supplement the data collected by CDM in October 1993. The work tasks included:

1. Collecting additional background soil samples at new locations both at the surface and subsurface for TCL/TAL metals parameters at DEC's request;

2. Collecting additional subsurface split spoon soil samples to determine the vertical extent of contamination on site, for TCL/TAL metals parameters (i.e., down to the contact between the uppermost water-bearing unit and the underlying aquitard);

3. Collecting both disturbed and undisturbed soil samples for soil chemistry/ geotechnical analysis;

4. Collecting soil samples for toxicity characteristic leachate procedure (TCLP) analysis from remaining cuttings or split spoons; and

5. Collecting additional samples at depth off site, to determine the vertical extent of contamination in subsurface soil, for analysis of TCL/TAL metals parameters.

The objectives of Phase II RI groundwater sampling were to confirm findings from Phase I investigations. This included collecting a second set of samples for TCL/TAL metals parameters, collecting samples for water chemistry properties (conventional rather than

hazardous parameters) analysis and collecting filtered samples for TAL metals analysis at each well for purposes of determining whether detected metals are dissolved or total.

The objective of Phase II RI shallow well slug tests was to obtain data needed to better evaluate pumping capabilities of the shallow water bearing unit.

Phase II RI groundwater screening samples were collected by the "Hydropunch" method to confirm whether contamination in the shallow water-bearing unit has migrated in a southerly direction toward Kennyetto Creek. Groundwater screening samples were collected in the zone between West Main Street and Kennyetto Creek.

Phase II RI surface water and sediment sampling in Kennyetto Creek was conducted to determine if contamination found at the site exists in the creek.

The objective of the abbreviated building interior reconnaissance was to evaluate whether organic vapors and combustible gases were above background or outside normal ranges, which could indicate the presence of these vapors/gases at unacceptable levels.

The objective of the 5-day soil vapor extraction treatability test was to evaluate the technology effectiveness for cleanup of the volatile organic contamination found at the site.

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Section 2
Existing Conditions

2.1 Site Conditions

The Korkay, Inc. site is vacant. The building structure occupies most of the one-acre site. A fence and gates were installed around the rear of the property, along the west, north and east boundaries, by the DEC in late 1992 and early 1993.

The original building is a two-story L-shaped wooden structure. Several additions of cement block structures were made to the original wooden structure. Although the building appears to be locked from the street, entry can be gained through an overhead door toward the rear of the building. Following heavy snowstorms in early 1994, a portion of the roof has collapsed into the building.

Drums, above-/underground tanks, and septic tanks at the site have been inventoried and tested by an independent contractor to the DEC's Bureau of Construction Services, during the summer of 1994. In August 1994, four of the drums tested were considered by the DEC to contain hazardous wastes. These drums were removed for off site disposal by the DEC. Drum and containers that were not considered by DEC to contain hazardous waste remain on-site. Notes from the inventory and testing activities conducted by the DEC's Bureau of Construction Services and related analytical results conducted by DEC's independent contractor are included in Appendix A of this report.

2.2 Environmental Setting

Environmental Setting and Land Use: The majority of the site is occupied by the building structure, and a fence and gates were installed along the north, east, and western boundaries of the site. Although drums are no longer stored outdoors, they are stacked 2 to 3 high, as well as on their sides, inside the building.

Land uses surrounding the site include a lumber yard/residences to the north, West Main Street to the south, a church to the east, and a residence to the west of the site. The site is zoned industrial. Properties immediately adjacent to the north side of the site and directly across the street from the site (south) are zoned commercial; properties immediately adjacent to the east and west sides of the site are zoned residential .

Topography and Surface Drainage: The site topography is relatively flat (not varying more than 2 ft in any one direction) with reportedly poor drainage. The site elevation is about 815 to 816 ft above mean sea level (msl).

In the past, site stormwater had reportedly drained to adjacent properties located north and west of the site. During wet weather, water would reportedly pond behind the site building. Also, to improve drainage conditions at the site, Korkay constructed its own storm sewer system consisting of several 15-gallon drums that were cut opened, placed end to end, and filled with crushed stone within a 4-ft deep, backfilled trench beginning midway along the western boundary, and ending at a dry well at the northeastern corner, of the site.

Hydrogeology: Shallow soil at the site is characterized by fine to medium-grained sand above silty clay. The silty clay unit, interbedded with lenses of clayey silt, silt, and sand, is present at depths ranging from about 9.5 to 42 ft below land surface (bls). Beneath this geologic unit is a thin sand and gravel unit that overlies dense silt till, which is present at depths ranging from about 34 to 54 ft bls. The till is underlain by Dolomite bedrock of the Cambrian Age Little Falls Formation.

Kennyetto Creek and the Great Sacandaga Lake are the closest surface water bodies to the Korkay site. Kennyetto Creek is located on the south side of West Main Street, about 600 ft south of the site, and flows in a southwesterly direction past the site. At the next town west of the site (Town of Mayfield), the creek turns and flows north to northeast, and discharges into the Great Sacandaga Lake.

Shallow groundwater was encountered at the site in the unconsolidated overburden at a depth of approximately 7.5 to 8 ft bls. Deep groundwater was encountered at the site beneath the silty clay unit (aquitard) at depths ranging from 32 to 43 ft bls.

Based on one round of water level measurements obtained during the Phase I RI, it appears that groundwater flow in the shallow water bearing zone is in a southerly direction. The data suggests that groundwater flow is generally easterly in the deep water bearing zone.

Meteorology: Precipitation data for Broadalbin, New York (based on monthly and annual precipitation normals from 1961 to 1990) ranges from a minimum of 2.63 inches in February to a maximum of 4.10 inches in June. In 1992, the total annual precipitation recorded at Albany, New York (which is located about 40 miles southeast of the site) was 31.9 inches. In the vicinity of the site, the warmest month of the year is July, with an average temperature of about 69 degrees Fahrenheit (F), and the coldest is January, with an average temperature of about 18 degrees F.

Wind velocities in the Albany area are moderate; in 1992, the average annual wind speed recorded in Albany was 8.9 miles per hour (mph). During periods of lighter winds, the Hudson River Valley, which runs north to south, has a marked effect on wind speed and direction. Hence, in the summer, it influences the average wind direction towards the south.

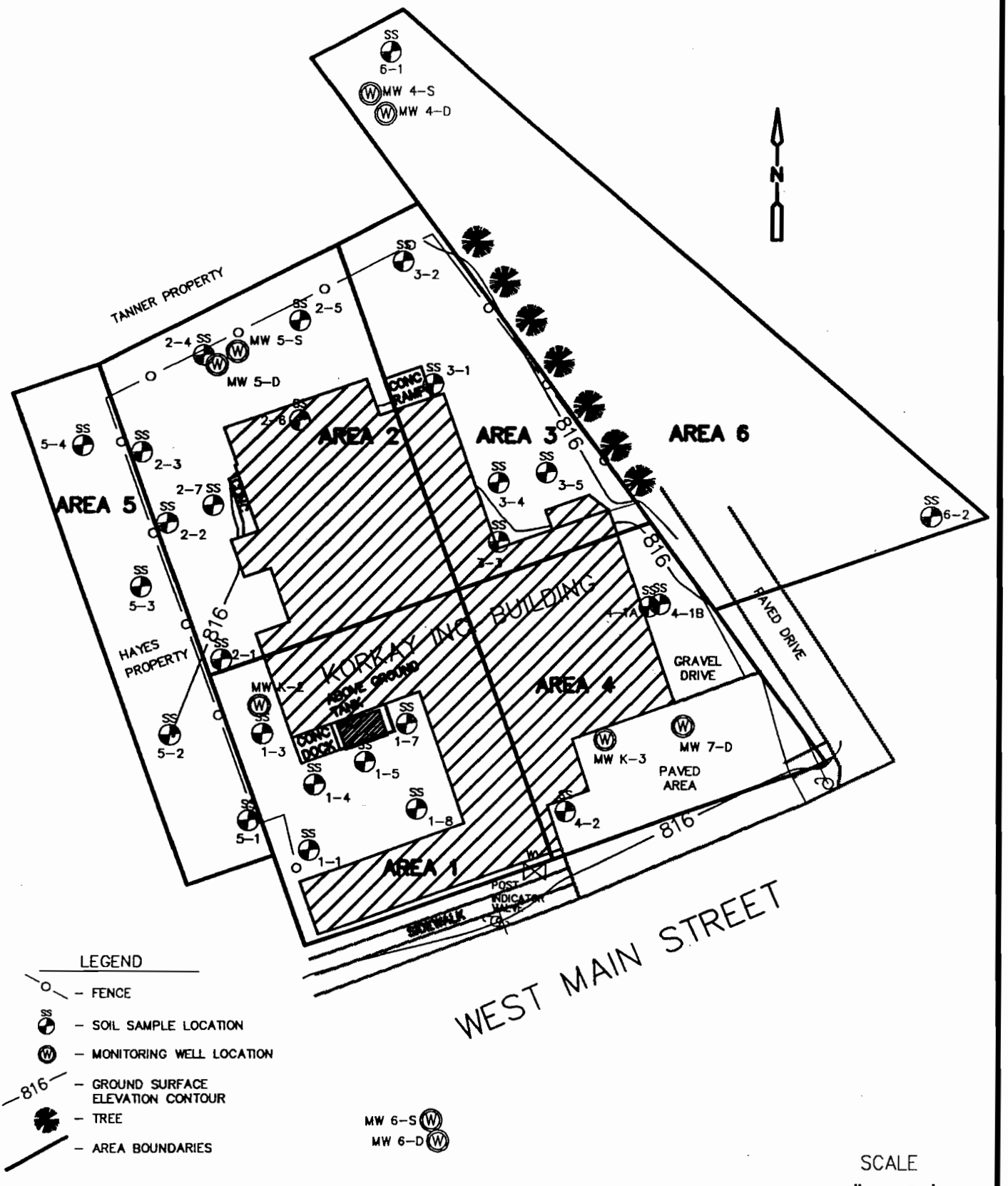
Further details of the environmental setting and descriptions are presented in the first phase Final RI Report prepared by CDM in April 1994 and submitted to DEC.

2.3 Phase I RI Nature and Extent of Contamination

Phase I of the RI was completed in October 1993; the results of the Phase I RI are discussed, in detail, in the April 1994 Final RI Report, and are summarized below.

2.3.1 Phase I Remedial Investigation (RI)

For purposes of the site RI, the study area was divided into six subareas, as shown in Figure 2-1. Areas 1, 2, 3, and 4 encompass the southwestern, northwestern, northeastern, and southeastern portions of the site, respectively. Area 5 encompasses the Hayes property, which is located adjacent to, and west of, the site, and Area 6 is located adjacent to, and east of, the site (the



SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 2-1

Investigation Areas and Sample Locations

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

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church property). Soil samples were collected in Area 6 in locations away from the Korkay site to define background constituent concentrations. In addition, environmental samples were also collected at the Tanner property which is located adjacent to, and north of, the site, also as shown on Figure 2-1. Soil and groundwater samples collected at the site were analyzed for EPA Target Compound List/Target Analyte List (TCL/TAL) parameters (VOCs, semi-VOCs, pesticides/polychlorinated biphenyl compounds [PCBs], and metals). Chemical-specific NYS Standards, Criteria, and Guidance (SCGs) used in the evaluation of Phase I RI soil and groundwater analytical results are presented in Appendix B of this report (refer to Tables 2-1 and 2-2). The NYS SCGs are discussed in detail in the Phase I and II Feasibility Study Report of February 1995.

Surficial Soils

Volatile organic compounds (VOCs), semi-VOCs, pesticides, and metals were detected in surface (at 0 to 0.5 ft bls) soil samples collected at Area 6 (background samples). Specifically, 1,1,1-TCA, toluene, di-n-butylphthalate, fluoranthene, pyrene, bis(2-ethylhexyl)phthalate, lindane, heptachlor epoxide, dieldrin,, 4,4'-DDE, 4,4'-DDD, 4,4'-DDT, endrin aldehyde, alpha chlordane, aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, vanadium, and zinc were detected in background surficial soil samples. However, only beryllium (at 0.2 milligrams per kilogram [mg/kg]) was detected at levels above its SCG (0.16 mg/kg). Detected background concentrations of aluminum (at 5,775 mg/kg), calcium (at 22,395 mg/kg), iron (at 8,345 mg/kg), lead (at 22.8 mg/kg), magnesium (at 10,431 mg/kg), manganese (at 107 mg/kg), and zinc (at 63.65 mg/kg) define the site SCGs, for surficial soils, for these metals. Although detected, the VOCs and SVOCs did not exceed the SCGs.

In Areas 1 through 5, VOCs were detected in surficial soils at concentrations less than NYS SCGs. Detected concentrations of semi-VOCs exceed SCGs in Areas 1 (benzo[a]pyrene, dibenzo[a,h]anthracene), 2 (hexachlorobenzene), and 5 (benzo[a]anthracene, benzo[a]pyrene, dibenzo[a,h]anthracene). The semi-VOCs detected above SCGs in Areas 1, 2, and 5 were not detected in background samples. In Area 2, detected pesticide (gamma-chlordane, aldrin, heptachlor epoxide) concentrations also exceed SCGs. In addition, alpha-chlordane, for which there is no SCG, was detected in Areas 1 (at 0.0073 and 0.02 mg/kg), 2 (from 0.022 to 6.8 mg/kg), 3 (from 0.0012 to 0.023 mg/kg), 4 (at 0.0019 mg/kg), and 5 (from 0.00073 to 0.0063 mg/kg) at levels above its background concentration (0.00036 mg/kg) determined by samples from Area 6. A summary of constituents that exceed SCGs in surficial soils at the site is provided in Appendix B of this report (refer to Table 2-3).

Several of the TAL metals were detected above SCGs in surficial soil samples collected in all areas of the site.

Subsurface Soils

Subsurface soil samples were collected at and in the vicinity of the site in Areas 1 through 6, as shown on Figure 2-1, at the following depths:

Area 1: 1.5 to 2.0, 3.5 to 4.0, and 4.5 to 5.0 ft bls.

Area 2: 1.5 to 2.0, 3.5 to 4.0, 6 to 8, and 20 to 22 ft bls.

Area 3: 1.0 to 1.5, 1.5 to 2.0, 3.5 to 4.0, and 4.5 to 5.0 ft bls.

Area 4: 1.5 to 2.0 and 6 to 8 ft bls.

Area 5: 1.5 to 2.0 ft bls.

Area 6: 1.5 to 2.0, 6 to 8, and 28 to 30 ft bls.

In addition, two split spoon soil samples were collected (at depths of 8 to 10, and 22 to 24, ft bls, respectively) during the drilling of the borehole for monitoring well MW-6D (located across the street from the Korkay site, as shown on Figure 2-1). The shallow water table was encountered at the site at a depth of about 7.5 to 8 ft bls.

In Area 6, at background soil sample locations SS-6-1 and SS-6-2, toluene was detected at 0.002 and 0.007 mg/kg, respectively, and di-n-butylphthalate was detected at 0.11 and 0.17 mg/kg/respectively, at a depth of 1.5 to 2.0 ft bls. Also, bis(2-ethylhexyl)phthalate (0.17 mg/kg) and toluene (0.002 mg/kg) were detected in samples collected at depths of 6 to 8, and 28 to 30, ft bls, respectively, during the drilling of the borehole for monitoring well MW-4-D in Area 6 (see Figure 2-1). All detected background concentrations are below SCGs.

Pesticides were also detected in Area 6. Specifically, at locations SS-6-1 and SS-6-2, at a depth of 1.5 to 2.0 ft bls, 4-4'-DDE was detected at 0.00052 and 0.00087 mg/kg, respectively, 4-4'-DDT at 0.00085 and 0.00074 mg/kg, respectively, methoxychlor at 0.0039 and 0.0023 mg/kg, respectively, and endrin aldehyde at 0.00075 and 0.00059 mg/kg, respectively. Also, gamma-chlordane was detected at 0.00027 mg/kg in a sample collected, from the monitoring well MW-4-D borehole, at a depth of 28 to 30 ft bls. Again, all detected background concentrations are below SCGs.

Aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, thallium, vanadium, and zinc were detected in background subsurface soil samples.

A summary of constituents that exceed SCGs in subsurface soils at the site is provided in Appendix B of this report (refer to Table 2-4). VOCs were detected at concentrations above SCGs in subsurface soil samples collected in Area 1, only. Specifically, TCE was detected (at 2.6 mg/kg) above its SCG (0.07 mg/kg) at one sample location (SS-1-4), only, at a depth of 1.5 to 2.0 ft bls. Xylene was also detected above its SCG (1.2 mg/kg) (at 12 [SS-1-4] and 11 [SS-1-5] mg/kg at depths of 1.5 to 2.0, and 4.5 to 5.0, ft bls, respectively).

Semi-VOCs were detected above SCGs in Areas 1, 2, and 5. Specifically, in Area 1, di-n-butylphthalate (SCG: 8.1 mg/kg) and benzo(a)pyrene (SCG: 0.061 mg/kg) were detected at a depth of 1.5 to 2.0 ft bls at sample locations SS-1-4 (27 mg/kg) and SS-1-5 (0.07 mg/kg), respectively; di-n-butylphthalate was also detected (at 8.4 mg/kg) at location SS-1-5, at a depth of 4.5 to 5.0 ft bls. 2,4-Dichlorophenol (SCG: 0.40 mg/kg) was detected (at 0.88 mg/kg in sample SS-2-3) in Area 2 at a depth of 1.5 to 2.0 ft bls. At Area 5, at a depth of 1.5 to 2.0 ft bls,

benzo(a)anthracene (SCG: 0.22 mg/kg) and benzo(a)pyrene (SCG: 0.061 mg/kg) were detected at 0.25 and 0.20 mg/kg, respectively, at location SS-5-2.

Pesticides were detected at concentrations above SCGs in Areas 2 and 3. Heptachlor epoxide (SCG: 0.02 mg/kg) was detected at 0.047, 0.11, and 0.032 at locations SS-2-1 (3.5 to 4.0 ft bls), SS-2-3 (1.5 to 2.0 ft bls), and SS-3-2 (3.5 to 4.0 ft bls), respectively. Gamma-chlordane (SCG: 0.54 mg/kg) was detected above its SCG at four locations: SS-2-1 (2.4 mg/kg, 3.5 to 4.0 ft bls), SS-2-3 (7.8 and 4.6 mg/kg, 1.5 to 2.0 ft bls), SS-2-7 (1.6 mg/kg, 1.5 to 2.0 ft bls), and SS-3-2 (1.0 mg/kg, 3.5 to 4.0 ft bls). Also, alpha-chlordane, for which there is no SCG but is a probable human carcinogen, was detected above its average site concentration (0.00195 mg/kg) in Areas 1, 2, and 3.

As with the surficial soil samples, several of the TAL metals were detected above SCGs in most of the subsurface soil samples collected in all areas of the site.

With regard to the TAL metals concentrations detected, many were found at or near concentrations within the range of naturally occurring metals in the eastern United States or similar to the background concentrations found in the vicinity of the site. However, there were several TAL metals detected in the surficial, and subsurface, soils at concentrations significantly exceeding SCGs. However, the DEC has no reason to believe that, based on available site historical information, TAL metals concentrations significantly exceeding SCGs are directly attributable to Korkay's past operations at this site, and are not considered to be primary contaminants of concern. Rather, based on available site historical information, the primary contaminants of concern at the site are the VOCs, followed by semi-VOCs, and then pesticides. As discussed in later sections of this report, DEC intends to evaluate remedies at the site to address the organic contamination found at this site. Part of the remedy to be evaluated includes removal of some soil and replacement with clean soil. DEC believes that soil excavation would be beneficial in also removing at least a portion of the soil with TAL metals concentrations exceeding SCGs, and that human contact with soils left in place will be precluded by replacing the excavated soils with clean soil.

Groundwater

Groundwater samples were collected from two newly installed upgradient wells (monitoring wells MW-4-S and MW-4-D in Area 6), one well located on property adjacent to, and directly north of the site (Tanner's Well), three newly installed site wells (monitoring wells MW-5S and MW-5D in Area 2, and monitoring well MW-7D in Area 4), two pre-existing site wells (monitoring well K-2 in Area 1 and monitoring well K-3 in Area 4), and two newly installed downgradient wells (monitoring wells MW-6-S and MW-6-D), as shown in Figure 2-1. The total depths of monitoring wells MW-4-S and MW-4-D are 10 and 46 ft bls, respectively; of Tanner's Well is unknown; of monitoring wells MW-5S, -5D, and -7D are 10, 40, and 55 ft bls, respectively; of K-2 and K-3 are 14.5 and 14 ft bls, respectively; and of monitoring wells MW-6-S and MW-6-D are 11 and 55 ft bls, respectively. Depth-to-water at the site is about 7.5 to 8.0 ft bls; deep groundwater was encountered at the site beneath an aquitard at depths ranging from 32 to 43 ft bls. At the direction of the DEC, collected groundwater samples were not filtered.

Shallow Groundwater

As shown in Appendix B of this report (refer to Table 2-5), VOCs, semi-VOCs, pesticides, and metals were detected at levels above SCGs (DEC and NYSDOH) in shallow groundwater samples collected at the site. Specifically, TCE (DEC and NYSDOH SCG: 5 micrograms per liter [ug/l]) was detected in samples collected from monitoring wells MW-5-S and K-2 at 12 and 21 ug/l, respectively. Ethylbenzene (SCG: 5 ug/l) was detected in a sample from monitoring well K-2 at a concentration of 19 ug/l, and 1,2-DCE (SCG: 5 ug/l) was detected in a sample from monitoring well MW-5-S at 16 ug/l. Xylene was detected above its SCG (5 ug/l) in monitoring wells MW-5-S (at 7 ug/l) and K-2 (at 110 ug/l). VOCs were not detected in any samples collected from upgradient wells (the Tanner well and monitoring well MW-4-S); xylene, 1,2-DCE, and toluene were detected downgradient of the site in well MW-6-S at 61, 4, and 6 ug/l, respectively.

Semi-VOCs were detected above SCGs in samples collected from monitoring wells K-2 and MW-6-S, only. 2,4-Dichlorophenol (DEC SCG: 1 ug/l) was detected in well K-2 at 4 ug/l; it was not detected downgradient of the site. Naphthalene was detected in well K-2 (at 23 ug/l) as well as downgradient, in well MW-6-S (at 29 ug/l), at levels that exceed its DEC SCG (10 ug/l) but not its NYSDOH SCG (50 ug/l). 1,2-Dichlorobenzene and 2-methylphenol were detected above SCGs downgradient of the site (at 16 and 26 ug/l, respectively), only.

In monitoring wells MW-5-S and K-2, 4-4'-DDE, dieldrin, and gamma- chlordane were detected (at 0.1, 0.08, and 0.77 ug/l, and 0.21, 0.02, and 0.82, respectively) above SCGs (0.01, 0.01, and 0.1 ug/l, respectively). Heptachlor epoxide was detected in monitoring well K-2 at 0.11 ug/l, above its DEC SCG of 0.01 ug/l but below its NYSDOH SCG of 0.20 ug/l. However, with the exception of heptachlor epoxide at 0.01 ug/l in monitoring well MW-4-S, these pesticides were not detected upgradient or downgradient of the site.

Also, alpha-chlordane, for which there is no SCG but is a probable human carcinogen, was detected in on-site monitoring wells MW-5-S and K-2 at 0.27 and 0.90 ug/l, respectively, but was not detected upgradient or downgradient of the site.

Metals were detected above SCGs in shallow groundwater on-site, as well as upgradient and downgradient of the site.

Deep Groundwater

Only metals were detected above SCGs in deep groundwater samples collected at and in the vicinity of the site, as shown in Appendix B of this report (refer to Table 2-5).

Of the metals detected in groundwater samples, except for chromium in well MW-4D, these were considered to be commonly found in groundwater. DEC has found high levels of iron in samples collected in the vicinity of the study area and local water supply wells have occasionally had elevated iron and manganese. Since there is no available historic information related to metals discharge at the Korkay site, these metals are believed to be naturally occurring in the groundwater, and are not considered to be primary contaminants of concern. During the Phase

II work, sampling and analysis was conducted on both filtered and unfiltered groundwater samples for confirmation purposes, in light of chromium exceeding criteria.

2.4 Water Supply Wells

Water supply wells are discussed in detail in the April 1994 Final RI Report for this site.

The Village of Broadalbin public water supply wells include the North Second Avenue and South Second Avenue wells, which are shown in Figure 2-2.

According to the Village Clerk's office, except for eight residences, all of the households in the village are connected to the public water supply. These eight residences are believed to have their own supply of water (wells). Two of the village residences, located on Cedar Lane, are within approximately 1,700 feet of the site. The two nearby private well sites located on Cedar Lane to the north/northwest of the Korkay site are shown on Figure 2-2. The other six village residences are located approximately one-half of a mile or more from the Korkay site, to the north and the northeast. According to verbal information provided by the Cedar Lane residents and the driller who installed both of these water supply wells (Junquerre Brothers of Northville, New York), these wells were installed at the same time and thus were similarly constructed. Well information includes the following:

	Guiffre Well	Jones Well
Date of installation	Oct. 1986	Oct. 1986
Well depth	~55 ft.	~66 ft.
Casing material	6 in. steel no screen	6 in. steel no screen
Pump	submersible	submersible
Formation pumped	gravel/sand (not in bedrock)	gravel/sand (not in bedrock)
Treatment Installed	"Culligan system" installed for iron	No softening system

Residents in the surrounding towns of Mayfield and Broadalbin reportedly have their own drinking water supply wells, since they are not hooked up to the village water supply. The nearest residential wells outside the village in the Town of Mayfield are reportedly approximately 1,700 to 1,800 feet to the west of the site.

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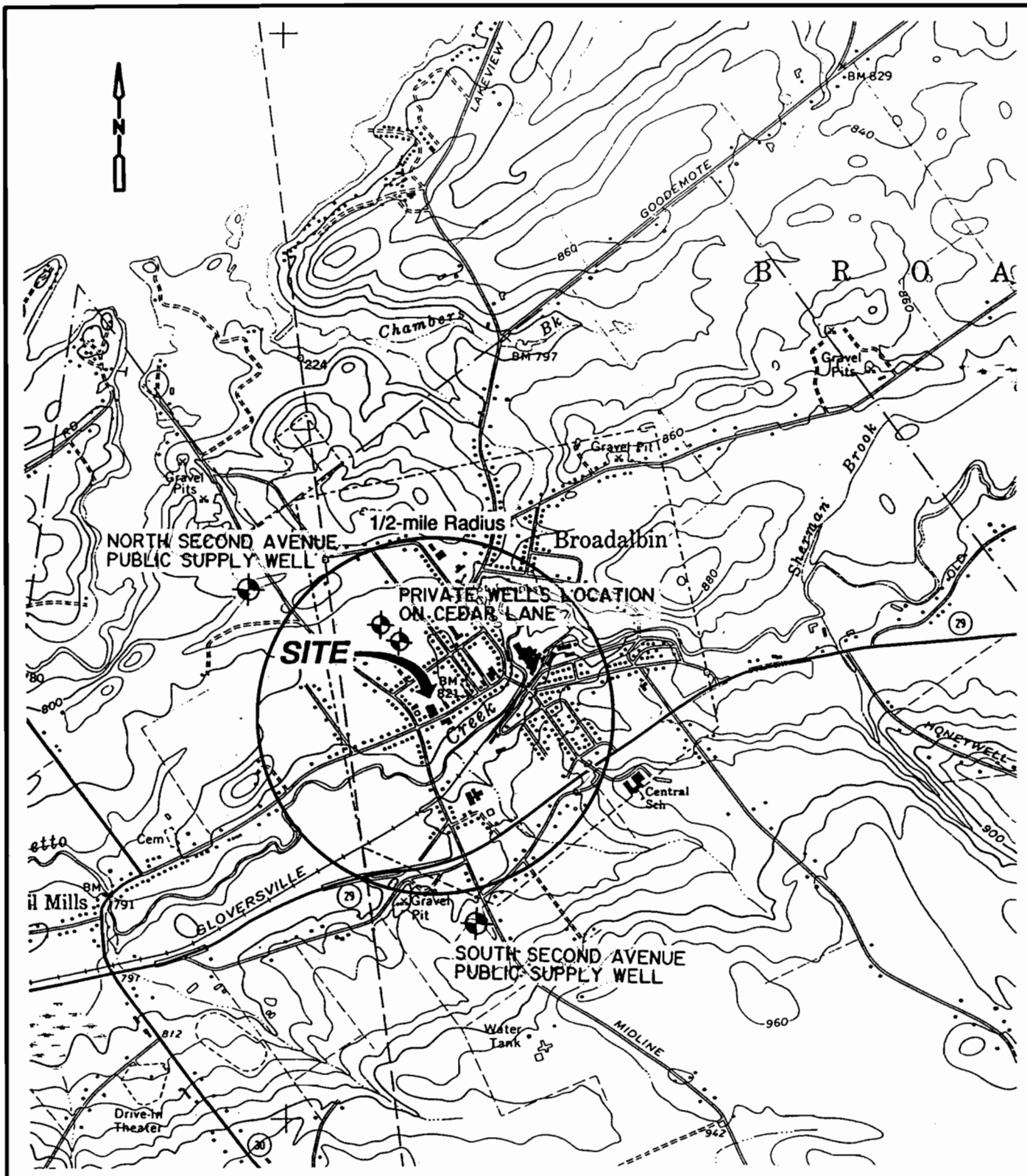

Source of Map: Broadalbin, NY Quadrangle, USGS

Note: Well locations are approximate.

Figure 2-2

Public & Private Well Location Map

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Korkay Inc. Site - Broadalbin, New York
NYSDEC Site #5-18-014

Section 3
Study Area Investigations

3.1 Introduction

The Phase II RI for the Korkay, Inc. site consisted of the following field activities to obtain necessary data for further evaluation of site characteristics to aid in the development of remedial action alternatives:

- supplemental subsurface soil characterization
- supplemental groundwater monitoring well sampling
- slug testing of two shallow wells
- field screening of the shallow water-bearing unit by "Hydropunch" methods
- surface water and sediment sampling in Kennyetto Creek
- building interior reconnaissance, and
- SVE/CASVE 5-day treatability testing.

This section presents an overview of each of these activities. Discussion of soil sampling is provided in Section 3.2, Supplemental Subsurface Soil Characterization. Discussion of site hydrogeology and groundwater sampling is provided in Section 3.3, Groundwater Sampling and Slug Testing. Discussion of surface water and sediment sampling is provided in Section 3.4, Surface Water and Sediment Investigation. Discussion of the building reconnaissance is provided in Section 3.5, Building Reconnaissance. Discussion of SVE/CASVE testing is provided in Section 3.6, SVE/CASVE Testing.

A detailed discussion of the laboratory analysis of collected samples is presented in Section 4, Nature and Extent of Contamination. A detailed discussion of field investigations findings, including site statigraphy and hydrogeologic characterization, is presented in Section 5, Field Investigation Findings. A discussion of Phase II RI laboratory data validation and usability was provided by CDM under separate cover to DEC.

3.2 Supplemental Subsurface Soil Characterization

The Phase II RI supplemental subsurface soil characterization was limited to the shallowest stratigraphic layer/water bearing zone at the site. Based on Phase I RI activities, no significant impacts of organic contamination found at the Korkay site were found in the deeper water bearing zone, therefore any further extensive study of the deeper strata during Phase II was considered unwarranted.

The main objectives of the subsurface soil characterization in the uppermost unit were to delineate the vertical extent of contamination in Areas 1, 2, 3 and 5; determine whether soils are considered hazardous for disposal purposes; collect a new set of background soil

samples; collect base line data for the SVE/CASVE treatability test; and characterize subsurface soil chemistry and geotechnical properties to evaluate SVE/CASVE treatability and evaluate other technologies, and provide additional hydrogeological data.

Subsurface soil samples from Areas 1, 2, 3, and 5 and background locations were analyzed for TCL organics and TAL metals to delineate contamination. Toxicity Characteristic Leachate Procedure (TCLP) soil samples were collected from Areas 1 and 2 to evaluate soils disposal options. Various geotechnical and geochemical soil samples were also collected from Areas 1 and 2 to provide additional information required for hydrogeological and SVE/CASVE evaluation purposes, and for the purposes of evaluating other remedial technologies. In addition to soil boring activity, the wells required for the SVE/CASVE treatability test were installed during this field event.

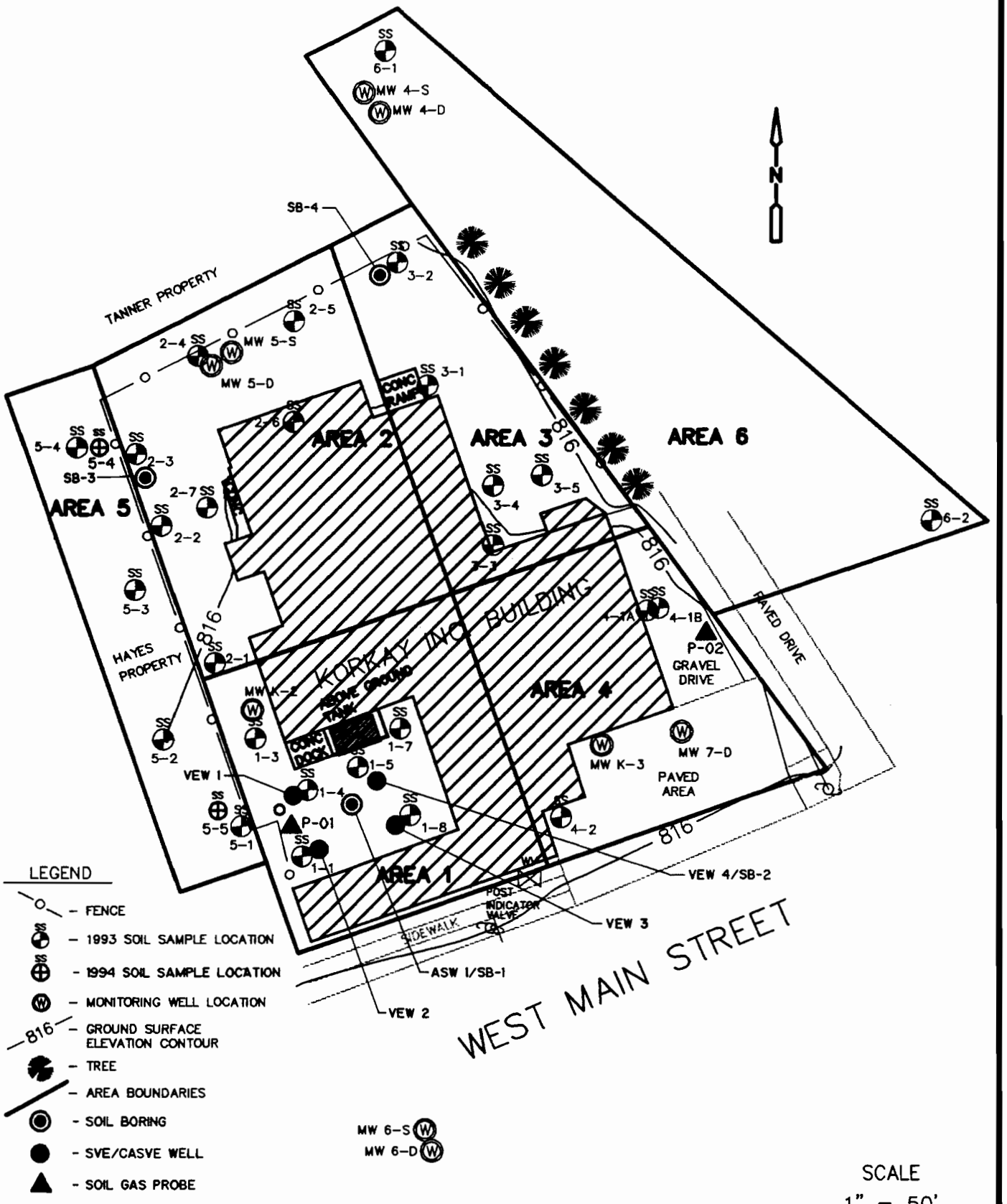
CDM and the drilling subcontractor, SJB Services, Inc., mobilized to the site on October 3, 1994. During that week the proposed soil borings and SVE/CASVE well installations were completed. Field activities were performed according to the Phase II RI Final Site Operations Plan (SOP) of September 1994, unless otherwise noted.

3.2.1 Delineation Soil Boring Installation (Hollow Stem Auger) and Split Spoon Soil Sampling

Four delineation soil borings, designated with the prefix SB, were drilled by hollow stem auger at the locations shown in Figure 3-1. Continuous split spoon samples were collected through the full thickness of the shallow water bearing unit to the top of the underlying aquitard. Each split spoon sample was examined by CDM's geologist, categorized according to the Burmister system, and scanned with a photoionization detector (PID).

Three samples from each soil boring were selected for laboratory analysis of TCL organics and TAL metals; three from the vadose zone and one from the base of the saturated zone, just above the underlying aquitard. Of the three vadose zone samples, one sample was collected immediately above the water table and the others were collected from the soils exhibiting the most evidence of contamination, such as high PID readings, visual staining, strong odors. The volatile organics analysis (VOA) portion of the TCL samples also provided baseline data in the SVE/CASVE treatability test area (SB-1 and SB-2).

The TCLP and geotechnical samples from Area 1 were collected from locations SB-2 and VEW-1. The Area 2 TCLP and geotechnical samples were collected from location SB-3. A list of the geochemical and geotechnical tests is provided in Table 3-1. These samples were collected from above the water table to provide data pertinent to the contaminated soils found in the vadose zone. The TCLP samples were biased toward the most contaminated materials, whether above or below the water table. Due to sample volume requirements and the use of Shelby tubes, additional borings alongside the original test borings were required to collect the geotechnical, geochemical and TCLP samples. (Note: The TCLP and



SCALE
1" = 50'

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 3-1

SOIL SAMPLE AND WELL LOCATION MAP

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

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TABLE 3-1
GEOCHEMICAL and GEOTECHNICAL TESTS

	SB-2 6-8	SB-2 6-7.2	SB-3 5-6	SB-3 7	VEW-1 7.5
Grain-Size by Hydrometer and Sieve	*X			X	
Soil Moisture	X			X	
Clay Minerals	X			X	
Organic Content	X			X	
USDA Soil Classification	X			X	
Redox Potential	X			X	
Soil pH	X			X	
TOC	X			X	
Cation Exchange Capacity	X			X	
Indigenous Soil Microbiota				X	X
Nutrient Availability				X	X
**Bulk Density		X	X		
**Porosity		X	X		

* = Two grain-size distributions were performed for this interval; one from 6 - 6.7' deep, the other from 6.7 - 7.5' deep.
** = Shelby Tube

{tab3-1.xls}

geochemical data will be used primarily during the detailed analysis of alternatives for remediation of the site.)

Borings were grouted to the surface upon completion, except those that were converted to wells for the SVE/CASVE treatability test. SVE/CASVE well installation is discussed in detail below.

In accordance with the approved SOP/QAPP, split-spoon soil samples were collected into plastic bags and immediately placed on ice inside a cooler. Seven split-spoon soil samples plus one duplicate sample were submitted for laboratory analysis. The soil samples for laboratory analysis were transferred into laboratory provided containers by means of a decontaminated stainless steel trowel following sampling. Samples for non-volatile parameter analyses were homogenized in a decontaminated stainless steel bowl before transfer into laboratory containers. Laboratory samples were prepared following completion of each borehole and were kept on ice inside a cooler. A summary of the split spoon soil samples collected, including sample location, sample ID number, sample depth, and analysis performed is provided in Appendix C of this report (refer to Table 3-2).

The soil boring logs for four borings, including SB-1 through SB-4, are included in Appendix D of this report.

3.2.2 ASW/VEW Well Installation

A total of four vapor extraction wells (VEW-1 through VEW-4), one air sparging well (ASW-1), and two pressure monitoring probes were installed for the SVE/CASVE test. The well and probe locations are shown on Figure 3-1. Well construction diagrams are provided in Appendix D of this report. The construction of each well is summarized in Appendix C of this report (refer to Table 3-3).

The air sparging and vapor extraction wells were drilled by hollow stem auger and constructed of 2-inch diameter PVC casing and screen. The air sparging well screen was set at the base of the shallow water bearing zone, completely submerged. Filter sand was placed in the annulus around the screen and the annulus around the casing was grouted. The vapor extraction well screens extend from approximately one foot below the water table to about 4 feet above it. Again, the annulus around the screens were filled with filter sand and the annulus around the casing was grouted.

The air sparging well, ASW-1, and one vapor extraction well, VEW-4 were constructed from two of the delineation soil borings. ASW-1 was constructed from SB-1 and SB-2 was converted into well VEW-4. At these locations, the TCL volatile organics portion of the TCL/TAL samples provides baseline data for the SVE/CASVE treatability test. The remaining 3 vapor extraction wells: VEW-1, VEW-2 and VEW-3, were not associated with

delineation soil borings. Borings at these locations were conducted in similar fashion to the delineation soil borings. However, they were advanced only about 2 feet into the water table, deep enough to accommodate well construction. The sample with the highest PID reading from each borehole was selected for laboratory analysis for TCL volatile organics to provide base line data for the SVE/CASVE treatability test. A summary of the split spoon soil samples collected, including sample location, sample ID number, sample depth, and analysis performed is provided in Appendix C of this report.

The soil boring logs and construction summaries for the ASW/VEW wells, including ASW-1/SB-1, VEW-1, VEW-2, VEW-3, and VEW-4/SB-2, are included in Appendix D of this report.

The gas pressure monitoring probes, numbered P-01 and P-02, were installed as drive points and constructed of 1 1/4-inch diameter stainless steel screen and casing. They were hydraulically pushed and/or driven so that the screen was set approximately at the water table. No borings or sampling were conducted for the gas pressure monitoring probes.

The construction summaries for the gas pressure monitoring probes, including P-01 and P-02, are included in Appendix D of this report.

3.2.3 Soil Sampling (Hand Auger)

Phase II RI field activities included collection of an additional set of off-site background soil samples and additional set of soil samples from the Hayes property.

On October 3, 1994, CDM collected four background soil samples. These background samples were collected at two locations, as shown in Figure 3-2. Sample depth increments included 0-6 inches and 18-24 inches. A summary of the background soil samples collected, including sample location, sample ID number, sample depth, and analysis performed is provided in Appendix C of this report.

The first background sample, BG-1, was located along the northeast border in the backyard of the neighboring church property, approximately 145 feet from MW-4S. The surficial sample, labeled BG-1A, and subsurface sample, labeled BG-1B, were collected. The second background sample, BG-2, was located on the southeast corner of Second Avenue and School Street, approximately 8 feet south of fire hydrant. The surficial sample, labeled BG-2A, and subsurface sample, labeled BG-2B, were collected.

At sample location BG-1, dry fine-to-medium brown sand and silt was observed at 0-to-6 inches. Dry medium-to-coarse tan sand, with trace silt, was observed at 18-to-24 inches.

At sample location BG-2, moist, dark brown fine sand and silt, with trace organic material and grubs, was observed at 0-to-6 inches. Moist, dark brown fine sand and silt was observed

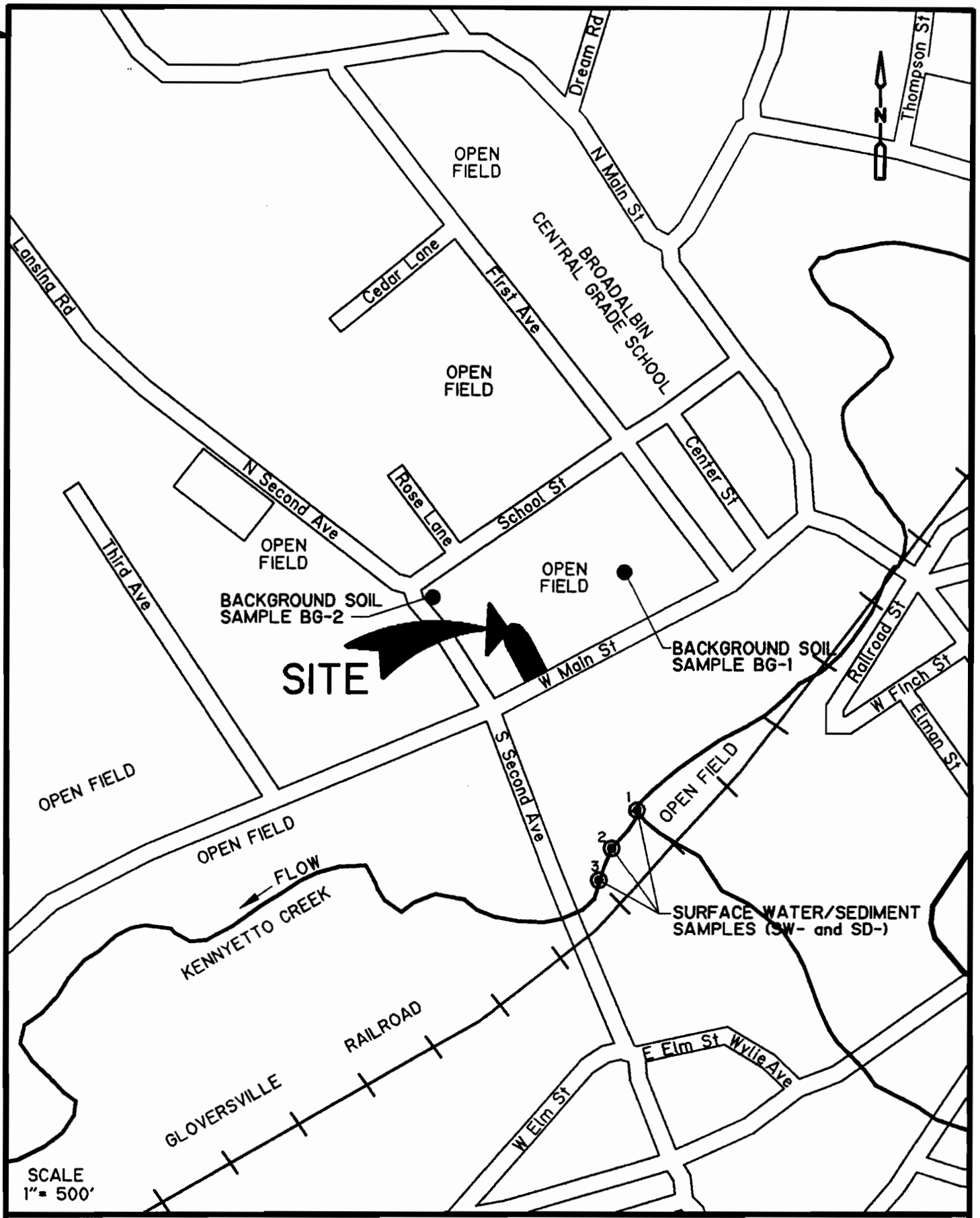

Figure 3-2

BACKGROUND SOIL AND SURFACE WATER/ SEDIMENT SAMPLE LOCATION MAP

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

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at 18-to-24 inches.

These background sample points were staked, measured from landmarks, and photographed. The samples were submitted for laboratory analysis, including TCL organic and TAL metals parameters.

In Area 5, the Hayes property, supplemental hand augering and soil sample collection at depth was performed on October 24, 1994. Four (4) soil samples were collected from two locations at depths of approximately 2-to-4 feet and 5-to-7 feet. Soil sample locations SS5-4 and SS5-5 are shown on Figure 3-1. A summary of the background soil samples collected, including sample location, sample ID number, sample depth, and analysis performed is provided in Appendix C of this report.

At sample location SS5-4, moist fine-to-medium sand, reddish-tan, with trace rounded pebbles, was observed at 2-to-4 feet. Very fine wet gray-tan sand was observed at 5-to-7 feet.

At sample location SS5-5, fine-to-medium moist tan sand was observed at 2-to-4 feet. Very fine-to-fine, orange-brown to tan wet sand with silt, was observed at 5-to-7 feet.

In Area 4, supplemental hand augering and soil sample collection at depth was attempted. However, at the intended location, brick and rubble was encountered at several spots when augering beyond approximately 8 inches in depth. Therefore, no at depth soil samples were collected. A surficial soil sample from 0-6 inches, numbered SS4-3A, had been collected but was not analyzed since there is existing surface soil (stained) data in Area 4.

3.2.4 Deviations from SOP

The TCL/TAL samples from just above the water table were intended to be collected from the 6-inch interval immediately above the water table (0-6 inches above the water table). Due to sample volume limitations, not all sample depths conformed to this plan. At SB-1, SB-2 and SB-3, the non-volatile fractions were collected depths from intervals of approximately 0-12 to 0-24 inches above the water table. The metals samples from SB-4 were collected from 6 inches above to 6 inches below the water table.

3.2.5 Quality Assurance/Quality Control

Before drilling each boring, equipment was decontaminated to prevent cross contamination. Drilling equipment was steam cleaned. Sampling equipment (split spoons, stainless steel trowels, and stainless steel bowls) was decontaminated using nitric acid and methanol rinses as specified in the site-specific SOP.

One duplicate TCL/TAL soil sample was collected to evaluate laboratory performance. One TCL/TAL field blank was collected to evaluate the effectiveness of the field decontamination

procedure, and/or whether laboratory contaminants affect the samples. All drill cuttings and decontamination fluids were contained.

3.3 Groundwater Sampling and Slug Testing

The objectives of the Phase II RI hydrogeologic characterization were to collect additional on-site and near-site groundwater quality data; collect groundwater quality data in the shallow water bearing zone downgradient of the site to evaluate whether contamination is approaching Kennyetto Creek; and evaluate the hydraulic conductivity of the shallow water bearing zone.

Groundwater quality data in the shallow water bearing zone downgradient of the site, toward Kennyetto Creek, was investigated by collecting groundwater samples with the hydropunch method. Hydropunch groundwater samples were collected by CDM and SJB Services, Inc. on October 10 and 11, 1994, following the conclusion of the Subsurface Soil Investigation. Additional on-site and near-site groundwater quality data was collected by sampling the existing monitoring wells. CDM conducted groundwater monitoring well sampling from October 25 to 27, 1994.

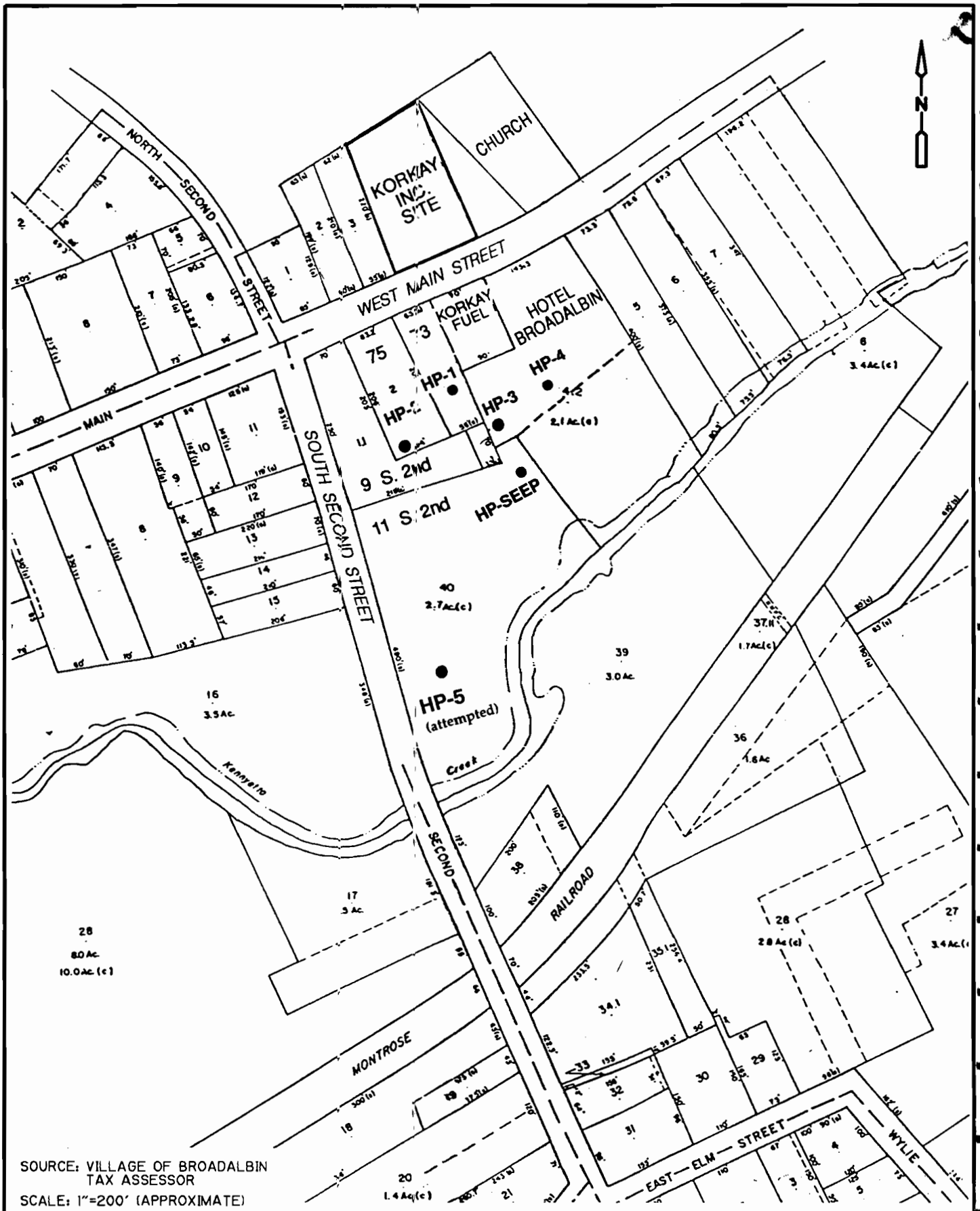
The hydraulic conductivity of the shallow water bearing zone was evaluated by performing slug tests on two on-site wells, MW-5 and K-2. CDM conducted the slug tests during the monitoring well sampling event from October 25 to 27, 1994.

The field activities conformed with those outlined in the SOP, except where otherwise noted.

3.3.1 Hydropunch Sampling

As part of Phase II RI field activities, hydropunch sampling was conducted on October 10 and October 11, 1994. CDM's geologist, DEC's geologist, SJB Drilling Services Inc. driller, and property owners of 11 South Second Street and the Hotel Broadalbin met to discuss proposed hydropunch sample locations prior to drilling (see Figure 3-3). A summary of the hydropunch samples collected, including sample location, sample ID number, and analysis performed is provided in Appendix C of this report.

The property owner at 11 South Second Street advised of areal limitations due to an existing pool, septic tank system, outbuildings, trees, and overhead electric lines. This property owner also owns property at 73 Main Street, which is next to the Korkay, Inc. fuel delivery service building. The property owner granted permission to DEC to install one hydropunch boring (HP-1) in the backyard at 73 Main Street. The water level was measured at approximately 7.5 feet below grade. The hydropunch was pushed from approximately 7 to 11 feet below grade, and pulled back to approximately 9 feet to expose about 2-feet of screen.



SOURCE: VILLAGE OF BROADALBIN TAX ASSESSOR

SCALE: 1"=200' (APPROXIMATE)

Figure 3-3

APPROXIMATE HYDROPUNCH SAMPLE LOCATION MAP

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

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A strong petroleum odor and high turbidity readings were noted during sampling. A bailer was used to collect an aqueous sample from this hydropunch location. Sample bottles were placed on ice in a cooler for overnight storage prior to shipment.

On October 11, 1994, the Hotel Broadalbin property owner advised CDM of areal restrictions. The property owner granted access with the exclusion of an area used as a dog run. This exclusion effectively eliminated two of the four proposed hydropunch sample locations. The sample collected from the first boring installed behind the hotel was labeled HP-4. Set to approximately 13 feet below grade with a 4-foot screen section, HP-4 produced a cloudy sample with a petroleum/septic odor. The sample collected from the second boring was labeled HP-3. This hydropunch screen was set from approximately 7.5 to 11 feet below grade. Matrix spike and matrix spike duplicate samples were collected at HP-3. A slight petroleum odor was noted during sample collection. Samples from these locations were collected via a peristaltic pump.

The property owner of 75 Main Street advised CDM of a leach field at this site. Sample number HP-2 was collected from a boring placed in the backyard of the property, on the end opposite the leach field. A duplicate sample labeled HP-12 was also collected at this location. This hydropunch screen was set from approximately 9 to 13 feet below grade. Clear samples with a slight petroleum odor were collected via a peristaltic pump.

Attempts made to collect sufficient sample volume from a boring installed on the side of the property at 11 South Second Street, in a former low-lying area that has been backfilled approximately 10 feet above the creek bank, were not successful. Augering was performed to 10, 15 and 20 feet. This sample location was near Kennyetto Creek. The level of the creek was estimated to be 18 feet below the ground surface of HP-5, but no water was encountered in this hole. Therefore, no sample HP-5 could be obtained. Cuttings were noted as being gray, saturated silty clay. Evidence of a peat layer was noted at about 12-feet below grade.

A spring or seep emerging from a slope behind the Hotel Broadalbin was observed. It was anticipated that this was the possible discharge point for the shallow water bearing zone. The elevation where the seep emerged from the slope appeared to be just below where the water table was encountered at other hydropunch sampling locations. For this reason, sample HP-SEEP was collected approximately 45 feet down the slope at the seep center, from 0 to 6 inches below grade, directly into sample containers. The hydropunch samples collected or attempted include:

Location/ Property Address	**Sample Number**
11 South Second Street	attempted HP-5; insufficient sample volume
73 Main Street	HP-1

Hotel Broadalbin	HP-4, HP-3, HP-SEEP
75 Main Street	HP-2, HP-12 (duplicate)

The samples collected during hydropunch activities were submitted to the laboratory for TCL organic parameter and TAL metal analysis. Following sample collection on October 11, 1994, the hydropunch sample containers were shipped to the analytical laboratory.

3.3.2 Slug Testing

Slug tests were performed on monitoring wells K-2 and MW-5S. See Figure 3-1 for groundwater well locations. Prior to slug testing, the depth to water of each well and the well geometry parameters were determined. At these wells, both well screens are partially above the water table. In this condition, falling head slug tests (in which the water level is artificially raised) are invalid because water would cascade out of the screen through the unsaturated sand pack. Therefore, only rising head slug tests (in which the water level is artificially lowered) were conducted on these wells.

A pressure transducer was lowered into the well and secured in place. The transducer was connected to a data logger which was programmed to record water levels in a logarithmic mode. In this mode, the logger records the water level at very short intervals at the beginning of the test, and then at progressively longer intervals.

A cylindrical slug was lowered into the well, displacing the water. Since no falling head test was to be performed, the field team waited until the water returned to the static level. At that point, the logger was activated and the slug was quickly removed from the well. Water levels were measured manually, to double check the data logger accuracy. Once the water level recovered at least 90% of the displacement, the test was considered complete and all test equipment was removed from the well.

3.3.3 Static Water Level Measurements

Prior to monitoring well purging, a round of synoptic water level measurements were collected from all of the wells using an electric water level indicator. Measurements were read from the top of the inner well casing (PVC). The data was noted in the Korkay field logbook and used in the calculations of purge volumes.

Monitoring well specifications are provided in Appendix C of this report (refer to Table 3-4). A summary of groundwater monitoring well elevations and water level data is provided in Appendix C of this report (refer to Table 3-5).

Continuous volatile organic vapor monitoring with the use of an OVM was performed by CDM during all phases of groundwater sampling.

3.3.4 Groundwater Sampling

As part of Phase II RI field activities, groundwater sampling was performed by CDM on October 25 and 26, 1994. Samples were collected from a total of nine wells.

Figure 3-1, similar to the Phase I RI groundwater sampling activity. A summary of the groundwater samples collected, including sample location, sample ID number, and analysis performed is provided in Appendix C of this report.

Depth to water level measurement, well purging, and sampling activities were completed in the following order: MW-4S, MW-4D, K-3, MW-5D, MW-5S, MW-6D, MW-6S, MW-7D, and K-2. Dedicated purging and sample collection materials were used for sampling each well.

Purging of the deep wells was performed using a dedicated, decontaminated submersible pump. The shallow wells were purged using a peristaltic pump with dedicated tubing. The meter used for measurement of pH, temperature, specific conductance, dissolved oxygen and turbidity was calibrated daily. The meter was used during well purging to verify stabilization of the various parameter readings. Field measurement readings were recorded in the logbook for each of the three well volumes purged. Purged water was containerized in drums, which were sealed and staged beside the overhead door in Area 2 as requested by the DEC. These drums were labeled according to their contents.

Groundwater sample collection was performed within two hours of completion of well purging. Dedicated, pre-cleaned, disposable teflon bailers were used for sample collection from the deep wells and the volatile samples from the shallow wells to sample containers. The peristaltic pump was used to collect non-volatiles samples directly from the shallow wells to sample containers.

Each sample bottle was capped, labeled, and placed on ice in a cooler. The DEC requested metals analysis for both filtered and unfiltered metals. Filtration of the metals samples was performed using a peristaltic pump and dedicated in-line disposable filters. The groundwater monitoring well samples collected were analyzed for TCL organic parameters and TAL filtered and unfiltered metals.

Primarily for the purposes of detailed analysis of alternatives for remediation of the site, water chemistry (conventional parameters) samples were collected from two of the shallow wells (K-2 and MW-5S).

3.4 Surface Water & Sediment Investigation

As part of Phase II RI field activities, surface water and sediment samples were collected. On October 4, 1994, CDM collected three surface water samples and three sediment water

samples from Kennyetto Creek. Surface water and sediment sample locations are shown on Figure 3-2. A summary of the surface water and sediment samples collected, including sample location, sample ID number, and analysis performed is provided in Appendix C of this report.

Before initiating sample collection, DEC conferred with CDM regarding sample locations. DEC and CDM agreed that samples would be collected from the north side of the creek. From the creek, the Korkay site is located to the north. The center sample location, between the upstream and downstream sample locations, was adjacent to the seep inlet to Kennyetto Creek. Where accessible, an upstream and a downstream sample would be collected 50-feet from the center sample location. It was agreed that sampling would begin at the downstream location, and that surface water sample collection would precede sediment sample collection.

The surface water in the creek was clear at the three sampling locations. At location 1, primarily brown sand and silt was observed in sediment sample SD-1. At location 2, primarily brown fine-to-medium and course sand was observed in sediment sample SD-2. At location 3, primarily fine brown sand and silt was observed in sediment sample SD-3.

Upon recording the field parameter measurements and collecting a field blank labeled FB-100494, the downstream surface water sample was collected and labeled SW-3. The downstream sediment sample, labeled SD-3, was then collected from the stream bed two feet below the surface. Similar to sample collection at location 3, the center surface water and sediment samples were collected and labeled SW-2 and SD-2, respectively. Concurrent with the collection of SW-2 and SD-2, duplicate samples were collected, and labeled SW-4 and SD-4, respectively. Matrix spike and matrix spike duplicate samples were collected at the center sample location. Similar to sample collection at location 3, upstream surface water and sediment samples, labeled SW-1 and SD-1 respectively, were collected approximately 50-feet upstream of the center sample location.

The Kennyetto Creek sample locations were staked, labeled, and photographed. The samples were placed on ice in coolers and shipped for laboratory analysis. Laboratory analysis included TCL organic and TAL metals parameters.

3.5 Building Reconnaissance

As requested by DEC, CDM conducted an abbreviated reconnaissance of the building interior on October 3, 1994. The scope of CDM's interior reconnaissance was limited to a brief walk through and continuous monitoring with an OVM and a combustible gas meter. Meter readings above background or outside normal ranges were not detected by CDM during this brief walk through. The brief reconnaissance was limited to indications of presence of vapors/gases at unacceptable levels based on instrument readings.

The DEC's Bureau of Construction Services previously conducted a visual survey of the building interior which included visual inspection and documentation of the building interior for apparent staining, spills, and presence of asbestos.

3.6 SVE/CASVE Treatability Study

See Appendix E of this report for a discussion of the SVE/CASVE treatability study work conducted in October 1994.

3.7 Laboratory Analysis, Data Validation, and Data Usability

Energy & Environmental Engineering Inc. (E3I) completed the chemical analysis of samples collected as part of the Phase II RI. Analysis of samples was conducted in accordance with the DEC Analytical Services Protocol (ASP) for the Contract Laboratory Program (CLP) issued in 1991.

Appendix F of this report includes tables summarizing the chemical analysis conducted on all soil and groundwater samples collected during the Phase II RI and the corresponding method quantitation limits.

Data validation was completed under subcontract by Chemworld Environmental Inc. (Chemworld) to determine and document analytical data quality in accordance with DEC CLP requirements. The analytical and validation processes were conducted in conformance with the CLP and are based on the United States Environmental Protection Agency's (EPA) Contract Laboratory Protocol "Statement of Work" documents and the associated "CLP Functional Guidelines for Data Validation" documents. Chemworld provided CDM with Data Validation Summary Reports explaining their findings.

A discussion of laboratory data usability has been provided by CDM under separate cover to DEC.

[m:/kork-ri/sec3.wpc]

Section 4
Nature & Extent of Contamination

4.1 Phase II RI Nature and Extent of Contamination

This section presents the results of analytical data collected during the Phase II RI. This data, along with the initial RI data collected in 1993, and reported in the April 1994 initial phase RI report, has been used to characterize the contamination present in the soils and groundwater at the site, possible source(s) of contamination, and the extent to which contamination may have migrated from the source(s) to offsite receptors.

The RI program was developed to evaluate the release of contaminants from the Korkay, Inc. site and to identify the potential sources of soil and groundwater contamination. Samples were collected from locations throughout the site, and also off-site, to identify the type and concentration of contaminants present in the environmental media. The investigation findings are also used to determine if contaminants present are attributable to past site operations.

The assessment of the presence of contamination was performed by comparing the sample results to concentrations of constituents typically observed in the media of concern (e.g., surface/ subsurface soils, sediment, surface water, and groundwater) and to applicable regulatory standards. The applicable regulatory standards selected and provided by DEC include:

- **Soil and Sediment:**
  NY State DEC, Division of Hazardous Waste Management, Technical and Administrative Guidance Memorandum (TAGM)/ Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-94-4046), dated January 24, 1994;

- **Groundwater and Surface Water:**
  NY State DEC, Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1)/ Ambient Water Quality Standards and Guidance Values, dated October 22, 1993; and NY State DOH drinking water supply maximum contaminant levels (MCLs), issued January 5, 1993.

An exceedance for a given contaminant may not necessarily be significant in terms of contaminant distribution. Slight variations in concentrations may be due to analytical variation or spatial variability and background concentrations.

4.1.1 Phase II Background Soil Data

Since contaminant levels above DEC TAGM soil criteria were detected in the background surface and subsurface soil samples collected during the initial RI activities, at DEC's direction, new soil background samples were collected during the Phase II RI work. The initial phase RI background soil samples were believed by DEC to contain "slightly higher levels of contaminants..... A true background sample should be free from the influences of any hazardous waste sites and any other sources of contaminants" (reference DEC correspondence of

4/7/94). Therefore, the Phase II RI background soil sample locations, were selected further away from site at DEC's request, as discussed in Section 3 of this report. For purposes of this Phase II RI report, since contaminant levels found in the initial phase RI background samples were unacceptable to DEC, the results were not used for comparison purposes.

Two soil sample locations numbered BG-1 and BG-2 were sampled at the surface and subsurface. Four soil samples were collected, including:

- two "A" series samples collected at 0-0.5'; and
- two "B" series samples collected at 1.5-2.0'.

The actual background sample locations were determined in the field by DEC, and are shown in Figure 4-1. Concentrations exceeding the SCGs criteria are also presented in Figure 4-1. A summary of the detected compounds in the background soil samples is presented in Table 4-1.

Organic Compounds

As shown in Table 4-1, levels of VOCs, SVOCs, and pesticides were detected in the background samples, both at the surface and in the subsurface at depths of 0-0.5 and 1.5-2.0'.

Two VOCs, including methylene chloride and trichloroethene, were detected in samples collected only at BG-2. (It is noted that since the methylene chloride concentrations detected in the soil samples exceeded 10 times the laboratory method blank results of 7 ug/kg, these results did not need data qualifiers.) No VOCs were detected at location BG-1.

A variety of SVOCs were detected at both of the surficial background soil sample locations. Benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)anthracene were detected at concentrations above DEC criteria at BG-2, sample BG-2A. No SVOCs were detected in subsurface sample BG-1B, and bis(2-ethylhexyl)phthalate was detected in subsurface sample BG-2B.

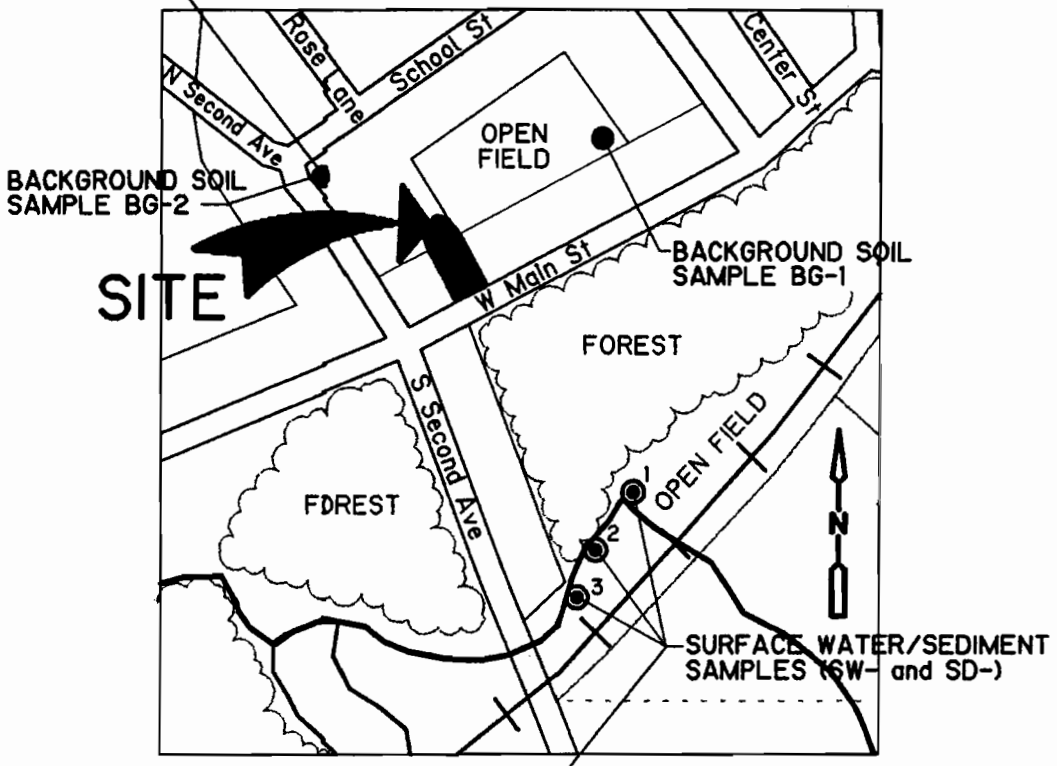
A variety of pesticides were also detected at both of the background soil sample locations, BG-1 and BG-2, in surface, and to a lesser degree, in subsurface soil. No PCB compounds were detected.

TAL metals

A summary of the detected compounds in the background soil samples is presented in Table 4-1.

The raw analytical data for the background samples collected, including laboratory method detection limits, has been summarized and is included in the tables contained in Appendix F. For ease of review of this report, a summary of the detected compounds for the soil samples collected is presented in tables contained in Appendix G. As an aid in interpreting the data, a summary of the number of detections, number of samples exceeding the criteria, and range of detected values is presented for each area in Appendix H.

	BG2A (0-05')	BG2B (1.5-2')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
METHYLENE CHLORIDE	150	130
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
BENZO(A)ANTHRACENE	240 J	---
BENZO(A)PYRENE	230 J	---
DIBENZO(A,H)ANTHRACENE	52 J	---



	SW1	SW2
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
VOCs		
TRICHLOROETHENE	28	---
	SW3	SW4 (DUP)
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
SVOCs		
BIS(2-ETHYLHEXYL)PHTHALATE	1 J	---

LEGEND

◉ - SOIL BORING

● - BACKGROUND SOIL SAMPLE

SCALE: 1" = 500'

Figure 4-1

BACKGROUND SOIL AND SURFACE WATER/ SEDIMENT SAMPLE RESULTS

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

CDM
environmental engineers, scientists, planners, & management consultants

M:\KORK\PII-ACAD\FIGURE4-1.DWG

Table 4-1

BACKGROUND SAMPLE COLLECTION
VOLATILE ORGANICS IN BACKGROUND SAMPLES

		UPPER LIMIT						
LOCATION ID ----->			BG-1	BG-1	BG-2	BG-2	BG-2
SAMPLE ID ----->		NYSDEC-SURFII	BG1A	BG1B	BG2A	BG2B	BG2BRE
SAMPLE DATE ----->		12/19/93	10/03/94	10/03/94	10/03/94	10/03/94	10/03/94
SAMPLE DEPTH ----->			0-0.5'	1.5-2.0'	0-0.5'	1.5-2.0'	1.5-2.0'
Volatile Organics (soils)							
METHYLENE CHLORIDE	ug/kg	100.00	--	--	150.00 1	130.00 1	--
TRICHLOROETHENE	ug/kg	700.00	--	--	--	2.00 J	--

NOTES:
NA Parameter not analyzed
-- Not detected above method detection limit.
---- Not available.
1 Sample value exceeds NYSDEC soil criteria.

Table 4-1

BACKGROUND SAMPLE COLLECTION
SEMIVOLATILE ORGANICS IN BACKGROUND SAMPLES

		UPPER LIMIT					
LOCATION ID ----->			BG-1	BG-1	BG-2	BG-2	BG-2
SAMPLE ID ----->		NYSDEC-SURFII	BG1A	BG1B	BG2A	BG2B	BG2BRE
SAMPLE DATE ----->		12/19/93	10/03/94	10/03/94	10/03/94	10/03/94	10/03/94
SAMPLE DEPTH ----->			0-0.5'	1.5-2.0'	0-0.5'	1.5-2.0'	1.5-2.0'
SemiVolatile Organics (soils							
PHENANTHRENE	ug/kg	50,000.00	--	--	250.00 J	--	NA
ANTHRACENE	ug/kg	50,000.00	--	--	71.00 J	--	NA
FLUORANTHENE	ug/kg	50,000.00	55.00 J	--	530.00	--	NA
PYRENE	ug/kg	50,000.00	52.00 J	--	380.00 J	--	NA
BUTYLBENZYLPHTHALATE	ug/kg	50,000.00	170.00 J	--	--	--	NA
BENZO(A)ANTHRACENE	ug/kg	220.00	--	--	240.00 J1	--	NA
CHRYSENE	ug/kg	400.00	32.00 J	--	260.00 J	--	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	50,000.00	280.00 J	--	180.00 J	22.00 J	NA
DI-N-OCTYL PHTHALATE	ug/kg	50,000.00	--	--	53.00 J	--	NA
BENZO(B)FLUORANTHENE	ug/kg	1,100.00	39.00 J	--	250.00 J	--	NA
BENZO(K)FLUORANTHENE	ug/kg	1,100.00	--	--	250.00 J	--	NA
BENZO(A)PYRENE	ug/kg	61.00	26.00 J	--	230.00 J1	--	NA
INDENO(1,2,3-CD)PYRENE	ug/kg	3,200.00	--	--	120.00 J	--	NA
DIBENZO(A,H)ANTHRACENE	ug/kg	14.00	--	--	52.00 J1	--	NA
BENZO(G,H,I)PERYLENE	ug/kg	50,000.00	--	--	130.00 J	--	NA

NOTES:
NA Parameter not analyzed.
-- Not detected above method detection limit.
---- Not available.
1 Sample value exceeds NYSDEC soil criteria.

Table 4-1

BACKGROUND SAMPLE COLLECTION
PESTICIDES AND PCBs IN BACKGROUND SAMPLES

		UPPER LIMIT					
LOCATION ID ----->			BG-1	BG-1	BG-2	BG-2	BG-2
SAMPLE ID ----->		NYSDEC-SURFII	BG1A	BG1B	BG2A	BG2B	BG2BRE
SAMPLE DATE ----->		12/19/93	10/03/94	10/03/94	10/03/94	10/03/94	10/03/94
SAMPLE DEPTH ----->			0-0.5'	1.5-2.0'	0-0.5'	1.5-2.0'	1.5-2.0'
Pesticides (soils)							
HEPTACHLOR	ug/kg	100.00	1.30 JN	--	--	--	NA
HEPTACHLOR EPOXIDE	ug/kg	20.00	2.20 J	--	--	--	NA
DIELDRIN	ug/kg	44.00	1.10 J	--	1.10 JN	--	NA
4,4'-DDE	ug/kg	2,100.00	--	2.20 JN	27.00 J	1.50 J	NA
ENDRIN, TOTAL	ug/kg	100.00	--	--	1.80 J	--	NA
ENDOSULFAN II	ug/kg	900.00	--	--	0.76 JN	--	NA
4,4'-DDD	ug/kg	2,900.00	5.70 JN	0.47 J	1.90 J	--	NA
4,4'-DDT	ug/kg	2,100.00	89.00 J	4.90 J	29.00 J	1.30 JN	NA
ALPHA-CHLORDANE	ug/kg	----	19.00 JN	0.52 JN	--	--	NA
GAMMA-CHLORDANE	ug/kg	540.00	13.00	1.40 JN	--	--	NA

NOTES:
NA Parameter not analyzed.
-- Not detected above method detection limit.
---- Not available.
1 Sample value exceeds NYSDEC soil criteria.

Table 4-1

BACKGROUND SAMPLE COLLECTION
INORGANICS IN BACKGROUND SAMPLES

LOCATION ID ----->		BG-1	BG-1	BG-2	BG-2	BG-2
SAMPLE ID ----->		BG1A	BG1B	BG2A	BG2B	BG2BRE
SAMPLE DATE ----->		10/03/94	10/03/94	10/03/94	10/03/94	10/03/94
SAMPLE DEPTH ----->		0-0.5'	1.5-2.0'	0-0.5'	1.5-2.0'	1.5-2.0'
Inorganics (soils)						
ALUMINUM	mg/kg	8,730.00	5,580.00	5,210.00	7,390.00	NA
ARSENIC	mg/kg	5.30	0.69 B	1.70 B	1.40 B	NA
BARIUM	mg/kg	20.00 B	9.80 B	24.80 B	21.10 B	NA
BERYLLIUM	mg/kg	--	--	--	0.23 B	NA
CADMIUM	mg/kg	1.40	--	--	--	NA
CALCIUM	mg/kg	2,250.00	585.00 B	3,880.00	1,930.00	NA
CHROMIUM	mg/kg	7.00 J	6.30 J	5.70 J	5.30 J	NA
COBALT	mg/kg	--	4.40 B	--	--	NA
COPPER	mg/kg	8.50	10.60	30.60	3.20 B	NA
IRON	mg/kg	10,500.00	8,730.00	9,020.00	8,670.00	NA
LEAD	mg/kg	34.80	2.80	67.00	10.90	NA
MAGNESIUM	mg/kg	711.00 B	1,680.00	1,690.00	866.00 B	NA
MANGANESE	mg/kg	82.20 J	119.00 J	121.00 J	90.30 J	NA
MERCURY	mg/kg	0.42	0.55	0.24	--	NA
NICKEL	mg/kg	3.10 B	4.80 B	3.80 B	--	NA
POTASSIUM	mg/kg	249.00 B	389.00 B	380.00 B	264.00 B	NA
SELENIUM	mg/kg	0.46 J	--	--	--	NA
VANADIUM	mg/kg	17.80	12.00	16.60	14.50	NA
ZINC	mg/kg	31.50	18.50	182.00	24.10	NA

NOTES:
NA Parameter not analyzed.
-- Not detected above method detection limit.
---- Not available.
NYSDEC Criteria dependent on soil background concentrations;
therefore no comparison conducted.

The results from the background surface and subsurface samples were arithmetically averaged to establish average background conditions for "surface" and "subsurface" values, respectively, for data comparison purposes. This approach is similar to the initial phase RI work.

As found in the initial phase RI background soil samples collected, the Phase II RI background soil sample concentrations were also not without detectable levels of TCL/TAL metals, where some exceed DEC TAGM soil criteria. The TAL metals detected could likely be naturally present in the soils. It is not believed that the background sample locations collected further away from the Korkay site would have been affected by contamination found at the site.

4.2 Phase II RI Soil

The results of the RI are discussed by area for the following classes of compounds:

- o TCL organic compounds including volatiles (VOCs), semi-volatiles (SVOCs), and pesticides/PCBs; and
- o TAL metals.

The raw analytical data, including laboratory method detection limits, has been summarized and is included in the tables contained in Appendix F. For ease of review of this report, a summary of the detected compounds for the soil samples collected is presented in tables contained in Appendix G. As an aid in interpreting the data, a summary of the number of detections, number of samples exceeding the criteria, and range of detected values is presented for each area in Appendix H.

The evaluation of organic data begins with a discussion of the distribution of organic compounds for surface and subsurface soils, by area. The evaluation of inorganic data begins with a discussion of the distribution of the TAL metals in the soil samples in terms of frequency of detection and concentrations relative to background. A discussion is then presented to provide an overview of the nature and extent of contamination.

Based on the initial RI results, Phase II RI soil sampling was conducted to determine vertical extent of TCL/TAL metals contamination in several areas of the site and complete data collection needs for feasibility study purposes.

Soil was sampled at both on-site and off-site locations. The same area designations as in the initial RI report are used, including:

Area 1: Southwest Quadrant of Site
Area 2: Northwest Quadrant of Site
Area 3: Northeast Quadrant of Site
Area 4: Southeast Quadrant of Site
Area 5: Hayes Property (Off-Site)

For the soil borings, the split spoon soil sample identification numbers are related to both the soil boring number and the depths at which the samples were collected. For example, the sample collected from soil boring SB-2 at the 6 to 8 foot depth is identified as SB268.

Although sample collection was attempted in Area 4, no Area 4 soil samples were analyzed during Phase II RI work, as discussed in Section 3 of this report.

For purposes of this Phase II RI report, as a point of reference in the evaluations by area for the organic parameters, levels detected were compared to the DEC TAGM recommended soil cleanup criteria.

Many metals in soils are naturally occurring, with widely varying concentrations that reflect the geological setting and other physical/chemical properties of the subsurface environment. Accordingly, the presence of these constituents at concentrations in soil above DEC TAGM criteria may not be indicative of contamination, but rather may reflect natural environmental conditions.

For metals in the DEC TAGM soil cleanup criteria defined as "site background" or "SB", the concentrations of TAL metals were compared to the average concentrations of the Phase II RI background subsurface samples. Where no "SB" designation is made, the DEC TAGM criteria value was used. A summary of the detected TAL metals in the soil samples collected is presented in Appendix G. A summary of the number of detections and number of samples exceeding criteria is presented in Appendix H.

The TAL metals concentrations detected in the samples collected from the site were found at or near concentrations within the range of naturally occurring metals in the eastern United States or similar to the background concentrations found in the vicinity of the site. However, in several samples, TAL metals detected in the surficial and subsurface soils significantly exceeded SCGs, and are presented in Appendix G. The DEC has no reason to believe that, based on available site historical information, metals are directly attributable to Korkay's past operations at this site; therefore, metals are not considered to be primary contaminants of concern. Some metals, such as arsenic, chromium and zinc may be associated with pesticide use.

4.2.1 Area 1: Southwest Quadrant of Site

Extensive soil sampling was conducted in Area 1, which is the most contaminated portion of the site. Area 1 is also where the SVE/CASVE treatability study was conducted.

Soil sample locations included SB-1/ASW-1, SB-2/VEW-4, VEW-1, VEW-2, and VEW-3, and were sampled at the subsurface, at varying depths.

Subsurface soil sample depths in Area 1 included the 2 to 4, 4 to 6, 6 to 8, 12 to 14, 7.5, and 2.4 foot ranges, for TCL/TAL metals analysis.

Shelby tube, geotechnical, geochemistry, and TCLP subsurface soil samples were also collected in Area 1, primarily for evaluation purposes during the detailed feasibility study phase. These data (the "non-TCL/TAL" results) are discussed in Section 5 of this report.

Quality assurance samples collected in Area 1 include one field duplicate sample (SB220) which is a duplicate of SB268.

The soil sample locations and depths were based on initial phase RI findings and were related to SVE/CASVE system installation (see section 3.0 for further descriptions) and are shown in Figure 4-2.

Volatile Organic Compounds

Similar to the initial phase RI findings, VOCs detected in soil samples collected in Area 1 include:

- o 1,2-dichloroethene (total);
- o 1,1,1-trichloroethane;
- o trichloroethene;
- o tetrachloroethene;
- o toluene;
- o ethylbenzene; and
- o xylene (total)

A summary of the detected VOC compounds in the Area 1 soil samples is presented in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-2.

As shown in Figure 4-2, VOC levels detected above DEC TAGM criteria are in samples SB168 (SB-1/ASW-1 at 6 to 8 feet), SB268 and duplicate SB220 (SB-2/VEW-4 at 6 to 8 feet), and VEW175 (VEW-1 at 7.5 feet). These borings are located near the concrete dock presumably used for the facility loading and unloading operations and the 4,000-gallon holding tank, shown as the aboveground tank in Figure 4-2, used to contain vat cleaning and spill cleanup washwater.

VOCs were detected in 11 of the subsurface soil samples collected, including SB112, SB124, SB168, SB212, SB220 (duplicate), SB224, SB246, SB268, VEW175, VEW275, VEW324. It is noted that VOC soil samples were collected at all of the ASW/VEW well locations for the purpose of determining baseline VOC concentrations related to the soil vapor extraction treatability study. Of these samples collected in Area 1, the three most contaminated samples included:

SB168 (ASW-1) at 6 to 8 feet: trichloroethene at 21,000 ppb, tetrachloroethene at 220 J ppb, toluene at 2,900 ppb, ethylbenzene at 11,000 ppb, xylene (total) at 78,000 ppb.

SB268/ SB220 duplicate sample (VEW-4) at 6 to 8 feet: trichloroethene at 200 J/320 J ppb, toluene at 160 J/360 J ppb, ethylbenzene at 1,800/5,800 ppb and xylene (total) at 19,000/44,000 ppb.

VEW 175 (VEW-1) at 7.5 feet: 1,1,1-trichloroethane at 200 J ppb, trichloroethene at 17,000 ppb, tetrachloroethene at 560 J ppb, toluene at 1,100 J ppb, ethylbenzene at 11,000 ppb, xylene (total) at 78,000 E ppb.

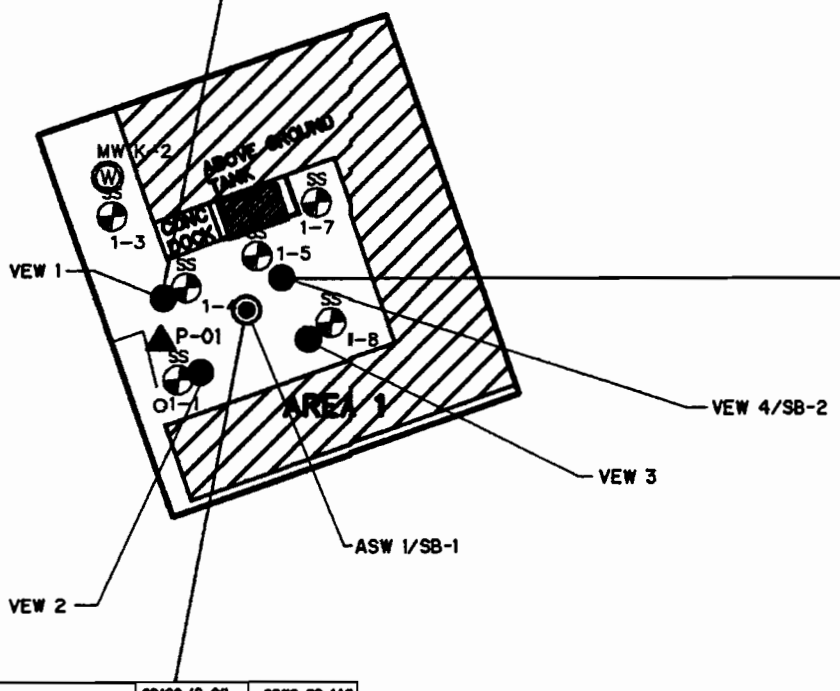
The most contaminated soils are generally limited to a layer several feet thick straddling the shallow water table. Except for 1,1,1-TCA, these contaminants were found in the shallow groundwater monitoring well samples.

NOTE : SAMPLING RESULTS EXCEEDING DEC TAGM SOIL CLEANUP CRITERIA ARE REPORTED IN THIS FIGURE.

	VEW175 (7.5')
PARAMETER	CONC. (ug/kg)
VOCs	
TRICHLOROETHENE	17000
ETHYLBENZENE	11000
XYLENE(TOTAL)	78000 E

	SB268 (6-8')	SB268RE
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
XYLENE(TOTAL)	19000	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
PHENOL	120 J	86 J
BENZO(A)PYRENE	81 J	95 J
	SB220 (6-8'dup)	SB220RE
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
ETHYLBENZENE	5800	---
XYLENE(TOTAL)	44000	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
PHENOL	99 J	96 J
BENZO(A)PYRENE	75 J	110 J

	SB168 (6-8')	SB112 (12-14')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
TRICHLOROETHENE	21000	---
TOLUENE	2900	---
ETHYLBENZENE	11000	---
XYLENE(TOTAL)	78000	---



LEGEND

- FENCE
- 1993 SOIL SAMPLE LOCATION
- 1994 SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- GROUND SURFACE ELEVATION CONTOUR
- TREE
- AREA BOUNDARIES
- SOIL BORING
- SVE/CASVE WELL
- SOIL GAS PROBE

SCALE
1" = 50'

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 4–2
AREA 1: Southwest Quadrant
Soil Sample Results
Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5–18–014

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Table 4-2
Contaminants in Soil Above Criteria
Area 1
Korkay Site, Broadalbin, New York

Contaminant	Phase I			Phase II			NYSDEC Soil Criteria (1)(2)	Units
	# of samples above criteria	# of samples analyzed	Range of results above criteria	# of samples above criteria	# of samples analyzed	Range of results above criteria		
VOCs:								
Trichloroethene	1	14	2,600	2	12	17,000-21,000	700	ug/kg
Xylene (Total)	3	14	11,000-12,000	4	12	19,000-78,000	1,200	ug/kg
Ethylbenzene	0	14	--	3	12	5,800-11,000	5,500	ug/kg
Toluene	0	14	--	1	12	2,900	1,500	ug/kg
Acetone	0	14	--	0	12	--	200	ug/kg
SVOCs:								
Di-n-butylphthalate	3	15	8,400-27,000	0	11	--	8,100	ug/kg
Benzo(a)pyrene	3	15	70-320	4	11	75-110	61	ug/kg
Dibenzo(a,h)anthracene	2	15	38-47	0	11	--	14	ug/kg
2,4-Dichlorophenol	0	15	--	0	11	--	400	ug/kg
Hexachlorobenzene	0	15	--	0	11	--	410	ug/kg
Benzo(a)anthracene	0	15	--	0	11	--	220	ug/kg
Phenol	0	15	--	4	11	86-120	30	ug/kg
Pesticides:								
Gamma-chlordane	0	14	--	0	9	--	540	ug/kg
Aldrin	0	14	--	0	9	--	41	ug/kg
Heptachlor epoxide	0	14	--	0	9	--	20	ug/kg
Endrin (Total)	0	14	--	0	9	--	100	ug/kg
Dieldrin	0	14	--	0	9	--	44	ug/kg

Notes: 1) NYSDEC TAGM, HWR-94-4046, January 24,1994.

2) NYSDEC criteria specified in this table is based on soil organic carbon content of 1%.

"--" designates that compound was not detected above the criteria

"N/A" designates no samples were collected

In the two samples collected at 12 to 14 feet, SB112 and SB212, VOC concentrations are below DEC TAGM criteria. This depth corresponds to the interface of the bottom of the shallow water-bearing zone and top of the aquitard. The data collected suggests that vertical delineation of VOC contamination to DEC TAGM criteria in Area 1 is complete, meeting the objective of the Phase II RI work. The initial phase RI results showed no significant organic contamination in the water zone below the aquitard.

Semi-Volatile Organic Compounds

Similar to the initial phase RI findings, SVOCs were detected in soil samples collected in Area 1. A summary of the detected compounds in the Area 1 soil samples is presented in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-2.

Several SVOCs were detected above DEC TAGM criteria in the Area 1 subsurface soil samples. The compounds detected include:

- o phenol,
- o naphthalene,
- o 2-methylnaphthalene,
- o phenanthrene,
- o di-n-butylphthalate,
- o fluoranthene,
- o pyrene,
- o butylbenzylphthalate,
- o benzo(a)anthracene,
- o chrysene,
- o bis(2-ethylhexyl)phthalate,
- o di-n-octyl phthalate,
- o benzo(b)fluoranthene,
- o benzo(k)fluoranthene,
- o benzo(a)pyrene,
- o indeno(1,2,3-cd)pyrene,
- o benzo(g,h,i)perylene.

As shown in Figure 4-2, SVOC levels detected above DEC TAGM criteria are in sample SB268 (SB-2/VEW-4 @ 6-to-8 feet) and its duplicate SB220. This boring is located near the concrete dock presumably used for the facility loading and unloading operations and closest to the 4,000-gallon holding tank, shown as the aboveground tank in Figure 4-2.

SVOCs were detected in 9 of the subsurface soil samples collected, including SB112, SB124, SB146, SB168, SB212, SB220 (duplicate), SB224, SB246, SB268. The highest concentration of several samples include:

SB168 (ASW-1) at 6 to 8 feet: naphthalene at 9,500 ppb, 2-methylnaphthalene at 3,900 ppb, bis(2-ethylhexyl)phthalate at 810 J ppb.

SB268/ SB220 duplicate sample (VEW-4) at 6 to 8 feet: phenol at 120 J/99 J ppb, naphthalene at 2,500/2,600 ppb, 2-methylnaphthalene at 1,600/1,600 ppb, phenanthrene at 67 J/61 J ppb, fluoranthene at 92 J/94 J, pyrene at 120 J/130 J ppb, butylbenzylphthalate at 0/960 ppb, benzo(a) anthracene at 64 J/67 J ppb, chrysene at 68 J/67 J ppb, bis(2-ethylhexyl)phthalate at 930/0 ppb, benzo(b)fluoranthene at 190 J/170 J ppb, benzo(k)fluoranthene at 110 J/130 J ppb, benzo(a)pyrene at 81 J/75 J ppb, indeno(1,2,3-cd)pyrene at 100 J/100 J ppb, benzo(g,h,i)perylene at 110 J/120 J ppb.

Similar to VOC contamination, the most contaminated soils are generally limited to a layer several feet thick straddling just above and at or just below the shallow water table. Many of these SVOCs were also detected in groundwater samples collected at the site.

Like the VOCs, in the two samples collected at 12 to 14 feet, SB112 and SB212, SVOC concentrations are below DEC TAGM criteria. This depth corresponds to the interface of bottom of the shallow water-bearing zone and top of the aquitard. The data collected suggests that vertical delineation of SVOC contamination to DEC TAGM criteria in Area 1 is complete, meeting the objective of the Phase II RI work.

Pesticides/ PCBs

Pesticides/PCBs were detected in samples collected from Area 1. A summary of the detected compounds in the Area 1 soil samples is presented in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-2.

As shown in Figure 4-2, similar to the initial RI findings, no pesticide concentrations in subsurface soil samples collected in Area 1 exceed DEC TAGM criteria. The compounds detected include:

- o beta-BHC,
- o gamma-BHC(lindane),
- o dieldrin,
- o 4,4-DDE,
- o endrin(total),
- o endosulfan II,
- o 4,4-DDD,
- o 4,4-DDT,
- o endrin aldehyde,
- o alpha chlordane,
- o gamma chlordane,

The PCB compound detected, Aroclor 1254, was found in the 2 to 4 and the 4 to 6 foot depth samples, at concentrations below DEC TAGM criteria.

In the two samples collected at 12-to-14 feet, SB112 and SB212, one pesticide was detected below DEC TAGM criteria. This depth corresponds to the interface of bottom of the water-bearing zone and top of the aquitard.

Nature and Extent

As found during the initial RI work, past site operations, such as discharge of drum wash water or leaking drums onto or into the ground, have affected the property as evidenced from the concentration of TCL organic analytes in Area 1. Higher concentrations and a wider range of VOCs and SVOCs were found in the a portion of the subsurface soils generally where the shallow water table exists. Although detected in the first 6 to 8 feet of soils, no pesticides or PCBs exceeding DEC TAGM criteria were present in Area 1.

Based on past historic site use as the drum storage and drum washing location and discharge location for two septic systems, Area 1 soils can be characterized as an apparent source area of VOC, and SVOC contamination, as a result of chemical spills and leaks.

4.2.2 Area 2: Northwest Quadrant of Site

Supplemental soil sampling was conducted in Area 2, which was characterized by the initial phase RI results, as a contaminated portion of the site.

One soil boring (SB-3) was completed in Area 2 and was sampled subsurface, at varying depths (see Figure 4-3). Subsurface soil sample depths in SB-3 included the 2 to 4, 4 to 6, 6 to 8, and 8 to 10 foot ranges, for TCL/TAL metals analysis.

Shelby tube, geotechnical, geochemistry, and TCLP subsurface soil samples were also collected in SB-3 at depths of approximately 5, 6, 7, and 8 feet, primarily for evaluation purposes during the detailed feasibility study phase. These data (the "non-TCL/TAL" results) are discussed in Section 5 of this report.

Quality assurance samples collected in Area 2 include one field blank sample (FB106).

Volatile Organic Compounds

Similar to the Phase I findings, VOCs detected in subsurface soil samples collected in Area 2 include:

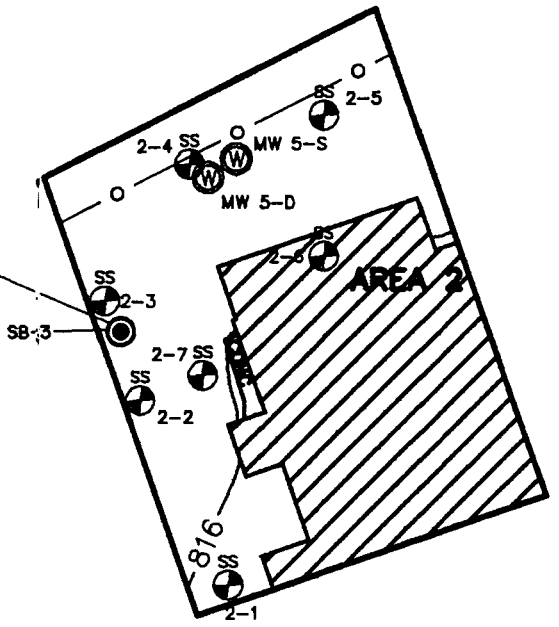
- tetrachloroethene;
- toluene;
- ethylbenzene; and
- xylene (total)

A summary of the detected compounds in the Area 2 soil samples is presented in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-3.

As shown in Figure 4-3, VOCs detected in subsurface soils exceed DEC TAGM soil cleanup criteria in sample SB346 at 4 to 6 feet. VOCs were detected in 3 of the subsurface soil samples collected, including, SB346 at 4 to 6 feet, SB368 at 6 to 8 feet, and SB310 at 10 feet. Of the samples collected in Area 2, the contaminated samples include:

NOTE : SAMPLING RESULTS EXCEEDING DEC TAGM SOIL CLEANUP CRITERIA ARE REPORTED IN THIS FIGURE.

	SB324 (2-4')	SB324DL
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
ENDRIN, TOTAL	150 E	---
GAMMA-CHLORDANE	---	2700 DJ
	SB346 (4-6')	SB346DL
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
XYLENE(TOTAL)	7900	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
HEPTACHLOR EPOXIDE	110 J	---
DIELDRIN	53 JN	---
ENDRIN, TOTAL	220 JN	---
GAMMA-CHLORDANE	630 E	4600 DJ
	SB368 (6-8')	SB368DL
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
PHENOL	75 J	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
HEPTACHLOR EPOXIDE	27 J	---
GAMMA-CHLORDANE		890 DJ



LEGEND

- FENCE
- 1993 SOIL SAMPLE LOCATION
- 1994 SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- GROUND SURFACE ELEVATION CONTOUR
- TREE
- AREA BOUNDARIES
- SOIL BORING
- SVE/CASVE WELL
- SOIL GAS PROBE

SCALE
1" = 50'

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 4-3
AREA 2: Northwest Quadrant Soil Sample Results
Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

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Table 4-3
Contaminants in Soil Above Criteria
Area 2
Korkay Site, Broadalbin, New York

Contaminant	Phase I			Phase II			NYSDEC Soil Criteria (1)(2)	Units
	# of samples above criteria	# of samples analyzed	Range of results above criteria	# of samples above criteria	# of samples analyzed	Range of results above criteria		
VOCs:								
Trichloroethene	0	14	--	0	4	--	700	ug/kg
Xylene (Total)	0	14	--	1	4	7,800	1,200	ug/kg
Ethylbenzene	0	14	--	0	4	--	5,500	ug/kg
Toluene	0	14	--	0	4	--	1,500	ug/kg
Acetone	1	14	200	0	4	--	200	ug/kg
SVOCs:								
Di-n-butylphthalate	0	13	--	0	4	--	8,100	ug/kg
Benzo(a)pyrene	0	13	--	0	4	--	61	ug/kg
Dibenzo(a,h)anthracene	0	13	--	0	4	--	14	ug/kg
2,4-Dichlorophenol	1	13	880	0	4	--	400	ug/kg
Hexachlorobenzene	1	13	1,700	0	4	--	410	ug/kg
Benzo(a)anthracene	0	13	--	0	4	--	220	ug/kg
Phenol	0	13	--	1	4	75	30	ug/kg
Pesticides:								
Gamma-chlordane	10	26	920 - 8900	4	7	630 - 4600	540	ug/kg
Aldrin	2	26	51 - 81	0	7	--	41	ug/kg
Heptachlor epoxide	5	26	37 - 170	2	7	27 - 110	20	ug/kg
Endrin (Total)	0	26	--	2	7	130 - 220	100	ug/kg
Dieldrin	0	26	--	1	7	51	44	ug/kg

Notes: 1) NYSDEC TAGM, HWR-94-4046, January 24,1994.

2) NYSDEC criteria specified in this table is based on soil organic carbon content of 1%.

"--" designates that compound was not detected above the criteria

"N/A" designates no samples were collected

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SB346 at 4 to 6 feet: tetrachloroethene at 120 J ppb, toluene at 83 J ppb, ethylbenzene at 970 J ppb, xylene (total) at 7,800 ppb.

SB368 at 6 to 8 feet: xylene (total) at 370 J ppb.

SB310 at 10 feet: ethylbenzene at 5 J ppb and xylene (total) at 18 ppb.

While the two samples collected below 4 to 6 feet, SB368 and SB310, contain detected VOC concentrations, the levels are below DEC TAGM criteria, and concentration decreases with depth. These data suggest that vertical delineation of SVOC contamination to DEC TAGM criteria in Area 2 is complete, meeting the objective of the Phase II RI work.

Semi-Volatile Organic Compounds

In addition to those SVOCs detected during initial RI work, SVOCs were detected in the supplemental subsurface soil samples collected in Area 2. A summary of the detected compounds in the Area 2 soil samples is presented in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-3.

As shown in Figure 4-3, in Area 2, one SVOC was detected above DEC TAGM criteria in one subsurface sample. Other SVOCs, below DEC TAGM criteria, were detected in a total of four subsurface samples. These compounds include:

- o phenol,
- o naphthalene,
- o 2-methylnaphthalene,
- o phenanthrene,
- o butylbenzylphthalate,
- o bis(2-ethylhexyl)phthalate.

Of the samples collected in Area 2, the contaminated samples include:

SB324 at 2 to 4 feet: bis(2-ethylhexyl)phthalate at 160 J ppb.

SB346 at 4 to 6 feet: naphthalene at 4,800 ppb, 2-methylnaphthalene at 5,100 ppb, phenanthrene at 140 J ppb, bis(2-ethylhexyl)phthalate at 1,100 J ppb.

SB368 at 6 to 8 feet: phenol at 75 J ppb, naphthalene at 790 ppb, 2-methylnaphthalene at 560 ppb, butylbenzylphthalate at 36 J ppb, bis(2-ethylhexyl)phthalate at 470 ppb.

SB310 at 8 to 10 feet: bis(2-ethylhexyl)phthalate at 200 J ppb.

The phenol concentration in sample SB368 collected at 6 to 8 feet exceeds DEC criteria. However, all other SVOC concentrations in Area 2 are below DEC TAGM criteria. This data suggests that vertical delineation of SVOC contamination to DEC TAGM criteria in Area 2 is complete, meeting the objective of the Phase II RI work.

Pesticides/ PCBs

As shown in Table 4-3, pesticides are present in concentrations exceeding criteria in the subsurface soil samples collected in Area 2. A summary of the detected compounds in the Area 2 soil samples is presented in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-3.

Pesticides were detected in all four subsurface soil samples collected. It appears that the pesticide contaminated soils generally occupy all depths. The compounds detected include:

- o beta-BHC,
- o gamma-BHC(lindane),
- o heptachlor epoxide,
- o dieldrin,
- o endrin(total),
- o 4,4-DDD,
- o 4,4-DDT,
- o alpha chlordane,
- o gamma chlordane.

As shown in Figure 4-3, pesticides were found at levels exceeding DEC criteria in three of four subsurface soil samples collected at soil boring SB-3, including sample SB324 at 2 to 4 feet, SB346 at 4 to 6 feet, SB368 at 6 to 8 feet.

In sample SB3810 collected at 8 to 10 feet, which is the deepest sample analyzed at this location, the pesticide concentrations are detected but below DEC TAGM criteria. These findings would suggest that pesticide contamination is limited to the first 8 feet of soils and that vertical delineation of pesticide contamination to DEC TAGM criteria in Area 2 is complete, meeting the objective of the Phase II RI work.

No PCBs were detected in the Area 2 subsurface samples.

Nature and Extent

As discussed in the initial phase RI report, past site operations, such as drums leaking onto or into the ground or conveyance of drum wash water through the storm drain, have affected the property as evidenced from the concentration of TCL organic analytes in Area 2.

From the Phase II RI findings, VOCs appear to be most concentrated down to the 4 to 6 foot depth of soils. SVOC and pesticide compounds may proceed slightly further in depth to the 6 to 8 foot depth. Pesticides exceeding DEC TAGM criteria were detected. The prevalence and concentrations of pesticides in Area 2 are of concern, although based on available historical information, pesticides use was not believed to have been part of Korkay's daily operations .

Based on past historic site use as a drum storage, Area 2 soils can be characterized as an apparent source area of VOC, SVOC, and pesticides contamination, as a result of possible spills and leaks.

4.2.3 Area 3: Northeast Quadrant of Site

Supplemental soil sampling, for vertical delineation purposes, was conducted in Area 3, which was characterized by the initial phase RI results as a contaminated portion of the site.

One soil boring (SB-4) was completed in Area 3 and sampled subsurface, at varying depths. Subsurface soil sample depths in SB-4 included the 2 to 4, 4 to 6, 6 to 6.5, 6.7 to 7.5, and 11 foot ranges, for TCL/TAL metals analysis (see Figure 4-4).

No quality assurance samples were collected in Area 3 during this field event.

Volatile Organic Compounds

Although acetone was detected in soil inside an enclosed shed, generally, there was no other VOC contamination above criteria found in Area 3 during the initial phase RI work. However, during the Phase II RI work, the VOCs detected in subsurface soil samples in Area 3 include:

- o ethylbenzene and
- o xylene (total).

A summary of the detected compounds in the Area 3 soil samples is presented in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-4.

As shown in Figure 4-4, the VOC levels detected in subsurface soils exceed DEC TAGM soil cleanup criteria at sample SB4665 collected at 6 to 6.5 feet. VOCs were detected in two of the subsurface soil samples collected, including SB411 at 11 feet and SB4665 at 6 to 6.5 feet. Of the samples collected in Area 3, the contaminated samples include:

SB4665 at 6 to 6.5 feet: ethylbenzene at 290 J ppb, xylene (total) at 1,900 ppb.

SB411 at 11 feet: xylene (total) at 2 J ppb.

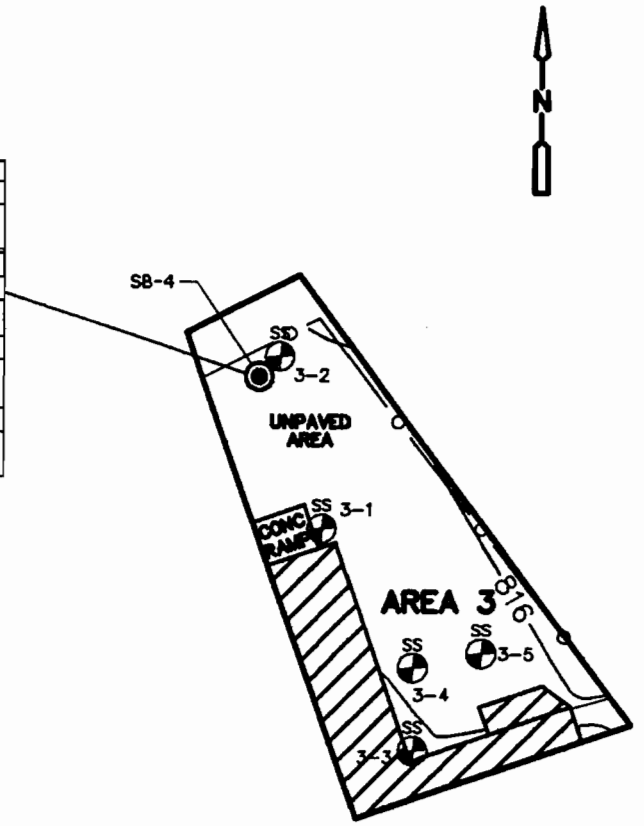
In SB-3, the VOC contamination appears to be limited to the portion of soil just at the shallow water table. The samples collected above the water in the vadose zone did not have VOC contamination present, and the sample at 11 feet had only a trace amount of xylene. This data suggests that vertical delineation of VOC contamination to DEC TAGM criteria in Area 3 is complete.

Semi-Volatile Organic Compounds

SVOCs are present in soil samples collected in Area 3. A summary of the detected compounds in the Area 3 soil samples is presented in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-4.

NOTE : SAMPLING RESULTS EXCEEDING DEC TAGM SOIL CLEANUP CRITERIA ARE REPORTED IN THIS FIGURE.

	SB446 (4-6')	SB446RE
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs PHENOL	82 J	85 J
	SB4665 (6-6.5')	SB4665DL
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs XYLENE(TOTAL)	1900	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs PHENOL	---	80 JD
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides GAMMA-CHLORDANE	---	780 DJ



LEGEND

- FENCE
- 1993 SOIL SAMPLE LOCATION
- 1994 SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- GROUND SURFACE ELEVATION CONTOUR
- TREE
- AREA BOUNDARIES
- SOIL BORING
- SVE/CASVE WELL
- SOIL GAS PROBE

SCALE
1" = 50'

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. -- NOVEMBER 1993

Figure 4-4
AREA 3: Northeast Quadrant Soil Sample Results
Korkay Inc. Site - Broadalbin, New York
NYSDEC Site #5-18-014

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Table 4-4
Contaminants in Soil Above Criteria
Area 3
Korkay Site, Broadalbin, New York

Contaminant	Phase I			Phase II			NYSDEC Soil Criteria (1)(2)	Units
	# of samples above criteria	# of samples analyzed	Range of results above criteria	# of samples above criteria	# of samples analyzed	Range of results above criteria		
VOCs:								
Trichloroethene	0	9	--	0	4	--	700	ug/kg
Xylene (Total)	0	9	--	1	4	1,900	1,200	ug/kg
Ethylbenzene	0	9	--	0	4	--	5,500	ug/kg
Toluene	0	9	--	0	4	--	1,500	ug/kg
Acetone	0	9	--	0	4	--	200	ug/kg
SVOCs:								
Di-n-butylphthalate	0	9	--	0	6	--	8,100	ug/kg
Benzo(a)pyrene	0	9	--	0	6	--	61	ug/kg
Dibenzo(a,h)anthracene	0	9	--	0	6	--	14	ug/kg
2,4-Dichlorophenol	0	9	--	0	6	--	400	ug/kg
Hexachlorobenzene	0	9	--	0	6	--	410	ug/kg
Benzo(a)anthracene	0	9	--	0	6	--	220	ug/kg
Phenol	0	9	--	3	6	82 - 110	30	ug/kg
Pesticides:								
Gamma-chlordane	1	10	1,000	1	7	780	540	ug/kg
Aldrin	0	10	--	0	7	--	41	ug/kg
Heptachlor epoxide	1	10	32	0	7	--	20	ug/kg
Endrin (Total)	0	10	--	0	7	--	100	ug/kg
Dieldrin	0	10	--	0	7	--	44	ug/kg

Notes: 1) NYSDEC TAGM, HWR-94-4046, January 24,1994.

2) NYSDEC criteria specified in this table is based on soil organic carbon content of 1%.

"--" designates that compound was not detected above the criteria

"N/A" designates no samples were collected

As shown in Figure 4-4, only phenol exceed DEC TAGM soil cleanup criteria in samples SB446 collected at 4 to 6 feet and SB4665 collected at 6 to 6.5 feet. Other SVOCs were detected in the four subsurface soil samples collected. The compounds detected include:

- o phenol,
- o 1,2,4-trichlorobenzene,
- o naphthalene,
- o 2-methylnaphthalene,
- o phenanthrene,
- o butylbenzylphthalate,
- o bis(2-ethylhexyl)phthalate.

Samples collected from Area 3 with the highest concentrations include:

SB446 at 4 to 6 feet: phenol at 85 J ppb and bis(2-ethylhexyl)phthalate at 310 J ppb.

SB4665 and RE at 6 to 6.5 feet: phenol at 110 JD ppb, 1,2,3-trichlorobenzene at 110 J ppb, naphthalene at 820 JD ppb, 2-methylnaphthalene at 780 JD ppb, phenanthrene at 47 J ppb, butylbenzylphthalate at 77 J ppb, bis(2-ethylhexyl)phthalate at 700 JD ppb.

SVOC contamination appears to be limited to the portion of soil at the shallow water table. The samples collected above the water in the vadose zone had slight SVOC contamination present, and the sample at 11 feet had slight SVOC contamination. This data suggests that vertical delineation of SVOC contamination to DEC TAGM criteria in Area 3 is complete.

Pesticides/ PCBs

A summary of the detected compounds in the Area 3 soil samples is presented in Appendix G. A summary of the number of detections and number of samples exceeding limits is presented in Appendix H.

As shown in Table 4-4, similar to the initial phase RI results, Area 3 pesticide concentrations are present above DEC TAGM criteria in the subsurface soils. The pesticides detected in Area 3 include:

- o delta-BHC,
- o gamma-BHC(lindane),
- o heptachlor epoxide,
- o dieldrin,
- o 4,4-DDE,
- o endrin(total),
- o endosulfan sulfate,
- o 4,4-DDD,
- o 4,4-DDT,
- o alpha chlordane,
- o gamma chlordane.

Pesticides were found at levels exceeding DEC criteria in one of the four subsurface soil samples in Area 3: sample SB4665 (diluted) collected at 6 to 6.5 feet.

In sample SB411 collected at 11 feet, pesticides were detected, but below DEC TAGM criteria. These findings suggest that pesticide contamination is limited to the first 6 to 8 foot portion of soils and that vertical delineation of pesticide contamination to DEC TAGM criteria in Area 3 is complete, meeting the objective of the Phase II RI work.

No PCBs were detected in the Area 3 subsurface soil samples.

Nature and Extent

As discussed in the initial RI report, past site operations such as drums leaking onto or into the ground, conveyance of drum wash water through the storm drain, and loading/unloading operations have affected the property as evidenced from the concentration of TCL organic analytes in Area 3. The VOC and SVOC levels found in the subsurface soil samples are more highly contaminated in samples near the shallow water table. Pesticides are present in Area 3 but appear to be limited to the 6 to 8 foot depth.

Area 3 can be characterized as a portion of the site contaminated with organic analytes.

4.2.4 Area 4: Southeast Quadrant of Site

During the Phase II RI, no Area 4 subsurface soil samples were submitted for analysis. As discussed in Section 3 of this report, brick or rubble was encountered when hand augering beyond approximately 8 inches and adequate subsurface samples could not be collected.

Sample results from initial phase sampling are shown in Table 4-5.

4.2.5 Area 5: Hayes Property (Off Site)

Two supplemental soil sample locations numbered 5-4 and 5-5 were sampled at subsurface depths by hand augering (refer to Figure 3-1 for sample locations). No TCL organics were detected above criteria in any of these Phase II samples.

A total of four supplemental samples was collected in Area 5, including:

- two samples collected at 2 to 4 feet; and
- two samples collected at 5 to 7 feet.

Quality assurance samples were not collected in Area 5.

Volatile Organic Compounds

In Area 5, VOCs were detected in one of four samples (SS55B at 5 to 7 feet) below DEC TAGM criteria, including:

- o carbon disulfide and
- o trichloroethene.

Table 4-5
Contaminants in Soil Above Criteria
Area 4
Korkay Site, Broadalbin, New York

Contaminant	Phase I			Phase II			NYSDEC Soil Criteria (1)(2)	Units
	# of samples above criteria	# of samples analyzed	Range of results above criteria	# of samples above criteria	# of samples analyzed	Range of results above criteria		
VOCs:								
Trichloroethene	0	3	--	N/A	N/A	N/A	700	ug/kg
Xylene (Total)	0	3	--	N/A	N/A	N/A	1,200	ug/kg
Ethylbenzene	0	3	--	N/A	N/A	N/A	5,500	ug/kg
Toluene	0	3	--	N/A	N/A	N/A	1,500	ug/kg
Acetone	0	3	--	N/A	N/A	N/A	200	ug/kg
SVOCs:								
Di-n-butylphthalate	0	3	--	N/A	N/A	N/A	8,100	ug/kg
Benzo(a)pyrene	0	3	--	N/A	N/A	N/A	61	ug/kg
Dibenzo(a,h)anthracene	0	3	--	N/A	N/A	N/A	14	ug/kg
2,4-Dichlorophenol	0	3	--	N/A	N/A	N/A	400	ug/kg
Hexachlorobenzene	0	3	--	N/A	N/A	N/A	410	ug/kg
Benzo(a)anthracene	0	3	--	N/A	N/A	N/A	220	ug/kg
Phenol	0	3	--	N/A	N/A	N/A	30	ug/kg
Pesticides:								
Gamma-chlordane	0	3	--	N/A	N/A	N/A	540	ug/kg
Aldrin	0	3	--	N/A	N/A	N/A	41	ug/kg
Heptachlor epoxide	0	3	--	N/A	N/A	N/A	20	ug/kg
Endrin (Total)	0	3	--	N/A	N/A	N/A	100	ug/kg
Dieldrin	0	3	--	N/A	N/A	N/A	44	ug/kg

Notes: 1) NYSDEC TAGM, HWR-94-4046, January 24,1994.

2) NYSDEC criteria specified in this table is based on soil organic carbon content of 1%.

"--" designates that compound was not detected above the criteria

"N/A" designates no samples were collected

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A summary of the detected compounds in the Area 5 subsurface soil samples is presented in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-6.

VOCs have been delineated vertically at these sample locations.

Semi-Volatile Organic Compounds

SVOCs were detected in one of four subsurface soil samples (SS54A at 2 to 4 feet) collected in Area 5, as summarized in Appendix G. The number of detections and number of samples exceeding DEC criteria is presented in Appendix H. A summary is presented in Table 4-6.

Three SVOCs were detected in the subsurface soils at 2 to 4 feet during the Phase II RI work (all below DEC TAGM). However, these SVOC compounds are different from those found during the initial RI work. The compounds detected in the Phase II RI work include:

- o phenanthrene,
- o fluoranthene, and
- o pyrene.

SS54A at 2 to 4 feet the following were detected: phenanthrene at 32 J ppb, fluoranthene at 34 J ppb, and pyrene at 22 J ppb.

SVOCs have been delineated vertically at these sample locations.

Pesticides/ PCBs

Pesticides are present in the Area 5 soils as summarized in Appendix G. A summary of the number of detections and number of samples exceeding limits is presented in Appendix H.

No pesticides were detected above DEC TAGM criteria in the subsurface soil samples. The pesticides detected in Area 5 include:

- o 4,4-DDE,
- o endosulfan II,
- o 4,4-DDT,
- o alpha chlordane,
- o gamma chlordane.

SS54A at 2 to 4 feet the following compounds were detected: 4,4-DDE at 0.39 JN ppb, 4,4-DDT at 2.6 J ppb, alpha chlordane at 1.5 JN ppb and gamma chlordane at 2.8 J ppb.

SS54B at 5 to 7 feet the following compounds were detected: 4,4-DDE at 8.0 JN ppb, alpha chlordane at 450 J ppb, and gamma chlordane at 370 J ppb.

SS55A at 2 to 4 feet the following compound was detected: endosulfan II at 0.45 JN ppb.

Table 4-6
Contaminants in Soil Above Criteria
Area 5
Korkay Site, Broadalbin, New York

Contaminant	Phase I			Phase II			NYSDEC Soil Criteria (1)(2)	Units
	# of samples above criteria	# of samples analyzed	Range of results above criteria	# of samples above criteria	# of samples analyzed	Range of results above criteria		
VOCs:								
Trichloroethene	0	10	--	0	4	--	700	ug/kg
Xylene (Total)	0	10	--	0	4	--	1,200	ug/kg
Ethylbenzene	0	10	--	0	4	--	5,500	ug/kg
Toluene	0	10	--	0	4	--	1,500	ug/kg
Acetone	0	10	--	0	4	--	200	ug/kg
SVOCs:								
Di-n-butylphthalate	0	10	--	0	8	--	8,100	ug/kg
Benzo(a)pyrene	6	10	95 - 200	0	8	--	61	ug/kg
Dibenzo(a,h)anthracene	1	10	39	0	8	--	14	ug/kg
2,4-Dichlorophenol	0	10	--	0	8	--	400	ug/kg
Hexachlorobenzene	0	10	--	0	8	--	410	ug/kg
Benzo(a)anthracene	2	10	250 - 260	0	8	--	220	ug/kg
Phenol	0	10	--	0	8	--	30	ug/kg
Pesticides:								
Gamma-chlordane	0	10	--	0	4	--	540	ug/kg
Aldrin	0	10	--	0	4	--	41	ug/kg
Heptachlor epoxide	0	10	--	0	4	--	20	ug/kg
Endrin (Total)	0	10	--	0	4	--	100	ug/kg
Dieldrin	0	10	--	0	4	--	44	ug/kg

Notes: 1) NYSDEC TAGM, HWR-94-4046, January 24,1994.

2) NYSDEC criteria specified in this table is based on soil organic carbon content of 1%.

"--" designates that compound was not detected above the criteria

"N/A" designates no samples were collected

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SS55B @ 5 to 7 feet the following compounds were detected: alpha chlordane at 1.7 JN ppb and gamma chlordane at 2.2 J ppb.

No PCBs were detected in the samples collected from Area 5.

Pesticides/PCBs have been delineated vertically at these sample locations.

Nature and Extent

Area 5, the Hayes property, is adjacent to Areas 1 and 2 of the site. As discussed in the initial phase RI report, past site operations creating contaminated run off may have contributed to contamination found on the adjacent Hayes property.

The organic contamination (VOC, SVOC, and pesticide compounds) decreases with depth in Area 5, with no constituents greater than DEC TAGM criteria in the Phase II RI samples. However, contaminants appear to be similar in nature to those found on site at Korkay, which indicates site contribution to off site contamination.

Area 5 can be characterized as a recipient of contaminants from the site.

4.3 Phase II RI Groundwater

During the Phase II RI work, groundwater contamination of the shallow water bearing unit was evaluated. Evaluation included sampling a network of five shallow monitoring wells, four hydropunch locations, and one seep location.

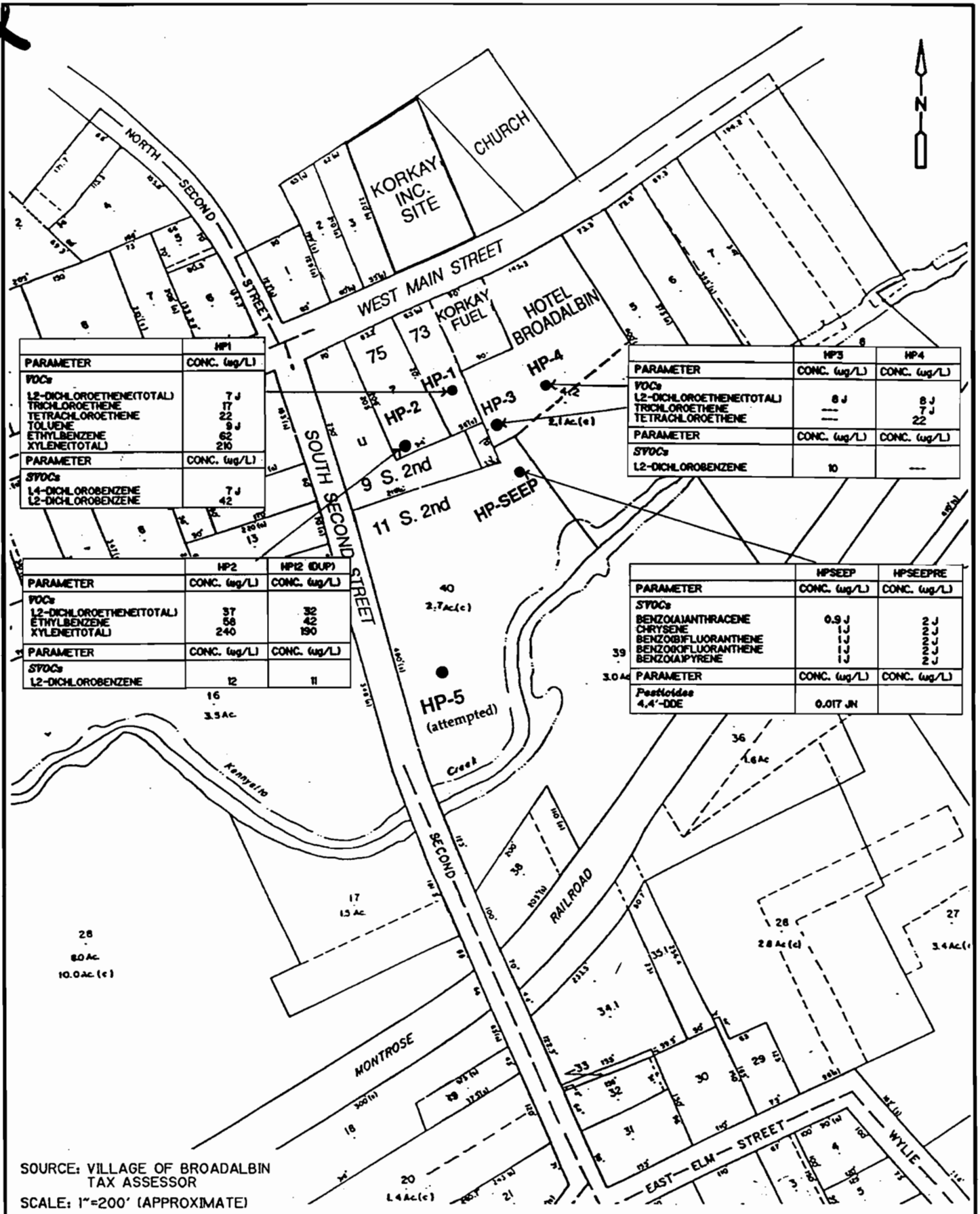
Monitoring well MW-4S provides background groundwater quality information; MW-5S, K-2 and K-3 provide on-site groundwater quality information; MW-6S provides groundwater quality information immediately downgradient of the site. Hydropunch samples HP-1 through HP-4 provide groundwater quality data further downgradient of the site. HP-SEEP provides water quality at the seep where the shallow water bearing zone discharges to the ground surface, as discussed in Section 3 of this report.

Groundwater quality in the water bearing unit(s) beneath the aquitard was also evaluated by sampling four deep monitoring wells MW-4D, MW-5D, MW-6D and MW-7D. Wells MW-5D and MW-7D are located on site. Wells MW-4D and MW-6D are off site, upgradient and downgradient, respectively.

The hydropunch sample and monitoring well locations are provided in Figures 4-5 and 4-6, respectively.

Groundwater samples collected from the monitoring wells were analyzed for TCL organic parameters, total TAL metals and dissolved TAL metals.

Hydropunch samples were analyzed for TCL organics and TAL metals (total metals only). The sample collected from the seep was analyzed for TCL organics.



	HP1
PARAMETER	CONC. (ug/L)
VOCs	
1,2-DICHLOROETHENE(TOTAL)	7 J
TRICHLOROETHENE	17
TETRACHLOROETHENE	22
TOLUENE	9 J
ETHYLBENZENE	62
XYLENE(TOTAL)	210
PARAMETER	CONC. (ug/L)
SVOCs	
1,4-DICHLOROBENZENE	7 J
1,2-DICHLOROBENZENE	42

	HP2	HP12 (DUP)
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
VOCs		
1,2-DICHLOROETHENE(TOTAL)	37	32
ETHYLBENZENE	58	42
XYLENE(TOTAL)	240	190
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
SVOCs		
1,2-DICHLOROBENZENE	12	11

	HP3	HP4
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
VOCs		
1,2-DICHLOROETHENE(TOTAL)	8 J	8 J
TRICHLOROETHENE	---	7 J
TETRACHLOROETHENE	---	22
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
SVOCs		
1,2-DICHLOROBENZENE	10	---

	HPSEEP	HPSEEPRE
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
SVOCs		
BENZO(A)ANTHRACENE	0.9 J	2 U
CHRYSENE	1 J	2 U
BENZO(B)FLUORANTHENE	1 J	2 U
BENZO(K)FLUORANTHENE	1 J	2 U
BENZO(A)PYRENE	1 J	2 U
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
Pesticides		
4,4'-DDE	0.017 JN	

SOURCE: VILLAGE OF BROADALBIN TAX ASSESSOR

SCALE: 1"=200' (APPROXIMATE)

Figure 4-5

HYDROPUNCH (GROUNDWATER) RESULTS

CDM

environmental engineers, scientists, planners, & management consultants

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

NOTE: SAMPLING RESULTS EXCEEDING DEC GROUNDWATER AND/OR DOH DRINKING WATER VALUES ARE REPORTED IN THIS FIGURE.

MW4S	
PARAMETER	CONC. (ug/l)
Pesticides	
4,4'-DDT	0.013 JN

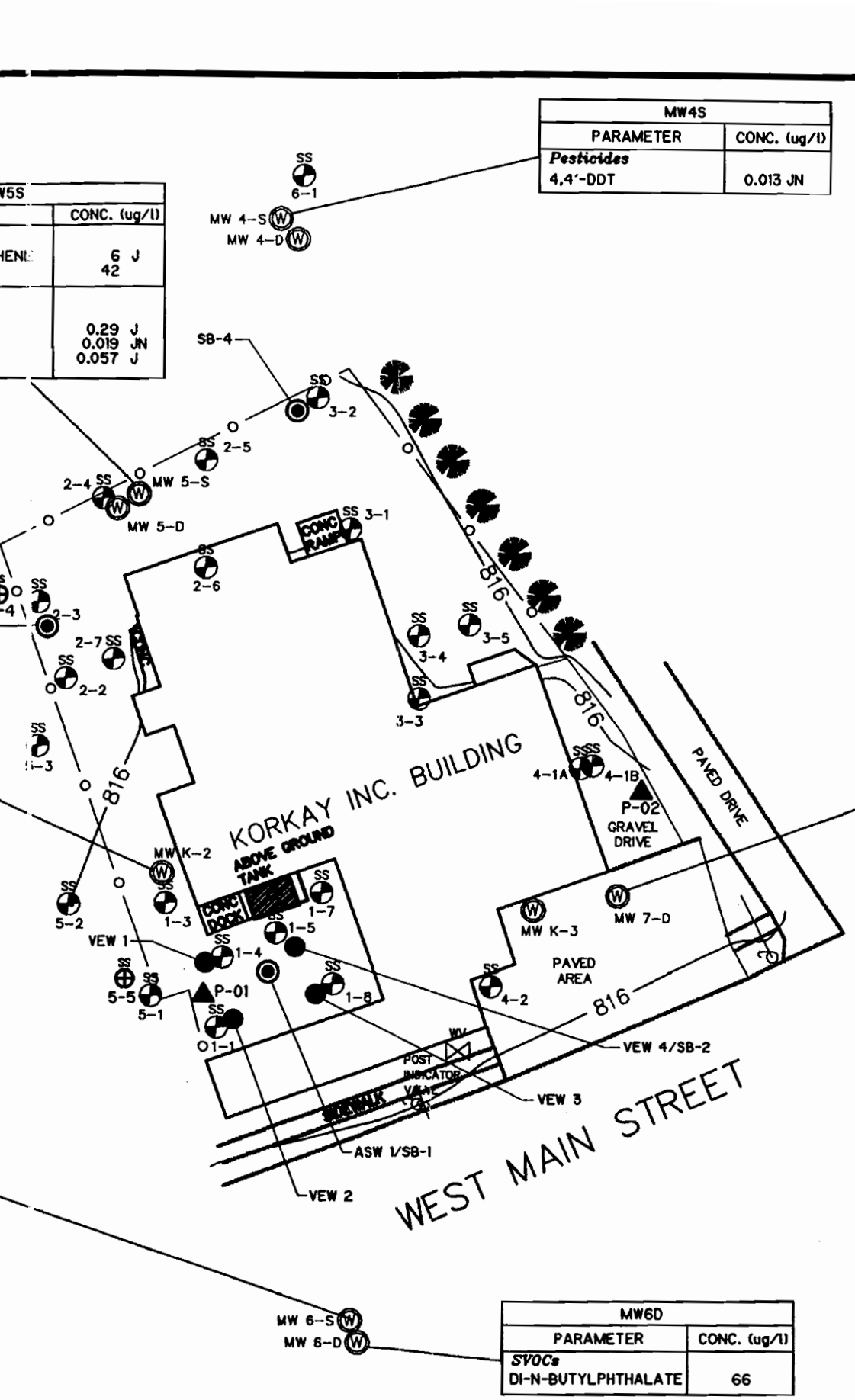
MW5S	
PARAMETER	CONC. (ug/l)
VOCs	
TETRACHLOROETHENE	6 J
XYLENE(TOTAL)	42
Pesticides	
ENDOSULFAN I	0.29 J
4,4'-DDE	0.019 JN
ENDRIN, TOTAL	0.057 J

	MWK2	MWK20 (dup)
PARAMETER	CONC. (ug/l)	CONC. (ug/l)
VOCs		
1,2-DICHLOROETHENE(TOTAL)	11	17
TRICHLOROETHENE	53	68
ETHYLBENZENE	33	76
XYLENE(TOTAL)	170	440 J
SVOCs		
NAPHTHALENE	49	20
DI-N-BUTYLPHTHALATE	---	59
Pesticides		
ALDRIN	---	0.14 JN
HEPTACHLOR EPOXIDE	0.084	0.063 JN
DIELDRIN	0.034 JN	0.026 JN
4,4'-DDE	0.17 JN	0.14 JN
ENDRIN, TOTAL	0.24 J	0.26 J
GAMMA-CHLORDANE	0.51 JN	0.58 JN
4,4'-DDD	---	0.02 JN
4,4'-DDT	---	0.046 JN

MW7D	
PARAMETER	CONC. (ug/l)
VOCs	
XYLENE(TOTAL)	12
SVOCs	
DI-N-BUTYLPHTHALATE	54

	MW6S	MW6SDL
PARAMETER	CONC. (ug/l)	CONC. (ug/l)
VOCs		
1,2-DICHLOROETHENE(TOTAL)	40 J	34 J
TRICHLOROETHENE	12	9 J
BENZENE	2 J	---
TOLUENE	110	99 J
ETHYLBENZENE	80	31 J
XYLENE(TOTAL)	880 E	1100 J
SVOCs		
1,2-DICHLOROBENZENE	32	39 D
2,4-DIMETHYLPHENOL	---	59 D
NAPHTHALENE	100 E	110 D
DI-N-BUTYLPHTHALATE	69	78 D
Pesticides		
ALDRIN	0.32 JN	---

MW6D	
PARAMETER	CONC. (ug/l)
SVOCs	
DI-N-BUTYLPHTHALATE	66



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LEGEND

- FENCE
- 1993 SOIL SAMPLE LOCATION
- 1994 SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- GROUND SURFACE ELEVATION CONTOUR
- TREE
- AREA BOUNDARIES
- SOIL BORING
- SVE/CASVE WELL
- SOIL GAS PROBE
- (D) – INDICATES FILTERED INORGANIC RESULT

1" = 50'

25 0 50

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 4–6

Groundwater Results

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

CDM
environmental engineers, scientists, planners, & management consultants

During both the hydropunch and monitoring well sampling events, a trip blank sample for TCL VOC analysis accompanied the sample bottles, identified as samples HPTB and TB, respectively. During the monitoring well sampling event a field blank for dissolved metals was collected to evaluate the effect of the filtering apparatus used, and is identified as sample FB102794. A field duplicate for TCL organics and total TAL metals was collected during both the hydropunch and monitoring well sampling events, identified as samples HP-12 (collected at HP-2) and K20 (collected at K-2), respectively.

Summary tables of the analytical results are provided in Appendix G. The number of detections, ranges, and number of exceedances of DEC groundwater and NYSDOH drinking water standards are summarized in Appendix H. A summary of VOC and SVOC exceedances is presented in Tables 4-7 and 4-8. The Phase II RI groundwater sampling results indicate consistently higher concentrations than earlier sampling results. A graphical depiction of exceedances is provided in Figures 4-5 and 4-6.

4.3.1 Shallow Water Bearing Unit

Volatile Organic Compounds

The target VOCs detected in the shallow water bearing unit and the locations where they were detected during Phase II RI sampling are listed below:

CONTAMINANT	GROUNDWATER SAMPLE LOCATION(S)									
	<------ ON SITE ---------->			<---------- OFF SITE---------->						
CARBON DISULFIDE					HP-1					
1,1-DICHLOROETHANE				MW-6S						
1,2-DICHLOROETHENE(TOTAL)	MW-K2			MW-6S	HP-1	HP-2	HP-3	HP-4		
TRICHLOROETHENE	MW-K2		MW-5S	MW-6S	HP-1	HP-2		HP-4		
BENZENE	MW-K2			MW-6S		HP-2				
TETRACHLOROETHENE	MW-K2	MW-K3	MW-5S	MW-6S	HP-1		HP-3	HP-4	HP-SEEP	
TOLUENE	MW-K2		MW-5S	MW-6S	HP-1	HP-2				
ETHYLBENZENE	MW-K2		MW-5S	MW-6S	HP-1	HP-2	HP-3			
XYLENE(TOTAL)	MW-K2		MW-5S	MW-6S	HP-1	HP-2	HP-3			

None of these VOC compounds were detected in the upgradient well, suggesting that none of these contaminants are from background sources; therefore, Korkay is the suspected source of the VOC contamination on site in the shallow groundwater. However, in some cases the data suggest that additional downgradient (south of the site) sources of off site contamination may exist, as discussed further below.

Benzene, toluene, ethylbenzene and xylene (BTEX) were generally found in the highest concentrations at location MW-6S, just downgradient of the site. BTEX has been found as far downgradient as the hydropunch locations and was also found in the on site groundwater. In addition, toluene, ethylbenzene and xylene have also been found in the site soils. These data suggest that the Korkay site is the source of the BTEX compounds and that they are migrating with groundwater flow. The data also suggest that there may be additional sources of BTEX existing downgradient of the site. Benzene exceeded the DEC groundwater criteria at one

Table 4-7

VOC and SVOC Contaminants in Groundwater Above Criteria
On-Site and Background Monitoring Wells
Korkay Site, Broadalbin, New York

Contaminant	K2		K3		4S *		4D *		5S		5D		7D		NYSDEC Criteria (1)	NYSDOH Criteria (2)	Units
	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II			
VOCs:																	
Tetrachloroethene	--	--	--	--	--	--	--	--	--	6J	--	--	--	--	5.0	5.0	ug/l
Trichloroethene	21	53	--	--	--	--	--	--	12	--	--	--	--	--	5.0	5.0	ug/l
1,2-Dichloroethene (Total)	--	11	--	--	--	--	--	--	16	--	--	--	--	--	5.0	5.0	ug/l
Xylene (Total)	110	170	--	--	--	--	--	--	7	42	--	--	--	12	5.0	5.0	ug/l
Ethylbenzene	19	33	--	--	--	--	--	--	--	--	--	--	--	--	5.0	5.0	ug/l
Benzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.7	5.0	ug/l
Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.0	5.0	ug/l
SVOCs:																	
Naphthalene	23	49	--	--	--	--	--	--	--	--	--	--	--	--	10.0	50.0	ug/l
1,2-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.7	5.0	ug/l
2-Methylphenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.0	50.0	ug/l
Di-n-butylphthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	54	50.0	50.0	ug/l
2,4-Dichlorophenol	4	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0	--	ug/l

Notes: (1) NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1) /
Ambient Water Quality Standards and Guidance Values, October 22, 1993.
(2) NYSDOH Drinking Water Supply MCLs, January 5,1993.
"--" designates that compound was not detected above the criteria

"*" designates background well
"J" - the associated numerical value is an estimated quantity

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Table 4-8
Select VOC and SVOC Contaminants in Groundwater Above Criteria
Off-Site Monitoring Wells
Korkay Site, Broadalbin, New York

Contaminant	6S		6D		HP1		HP2		HP3		HP4		HPSEEP		NYSDEC Criteria (1)	NYSDOH Criteria (2)	Units
	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II	Phase I	Phase II			
VOCs:																	
Tetrachloroethene	--	--	--	--	N/A	22	N/A	--	N/A	--	N/A	22	N/A	--	5.0	5.0	ug/l
Trichloroethene	--	12	--	--	N/A	17	N/A	--	N/A	--	N/A	7J	N/A	--	5.0	5.0	ug/l
1,2-Dichloroethene (Total)	--	40J	--	--	N/A	7J	N/A	37	N/A	8J	N/A	8J	N/A	--	5.0	5.0	ug/l
Xylene (Total)	61	880E	--	--	N/A	210	N/A	240	N/A	--	N/A	--	N/A	--	5.0	5.0	ug/l
Ethylbenzene	--	80	--	--	N/A	62	N/A	58	N/A	--	N/A	--	N/A	--	5.0	5.0	ug/l
Benzene	--	2J	--	--	N/A	--	N/A	--	N/A	--	N/A	--	N/A	--	0.7	5.0	ug/l
Toluene	6	110	--	--	N/A	9J	N/A	--	N/A	--	N/A	--	N/A	--	5.0	5.0	ug/l
SVOCs:																	
Naphthalene	29	100E	--	--	N/A	--	N/A	--	N/A	--	N/A	--	N/A	--	10.0	50.0	ug/l
1,2-Dichlorobenzene	16	32	--	--	N/A	42	N/A	12	N/A	10	N/A	--	N/A	--	4.7	5.0	ug/l
2-Methylphenol	26	--	--	--	N/A	--	N/A	--	N/A	--	N/A	--	N/A	--	5.0	50.0	ug/l
Di-n-butylphthalate	--	69	--	66	N/A	--	N/A	--	N/A	--	N/A	--	N/A	--	50.0	50.0	ug/l
2,4-Dichlorophenol	--	--	--	--	N/A	--	N/A	--	N/A	--	N/A	--	N/A	--	1.0	--	ug/l

Notes: (1) NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1) / Ambient Water Quality Standards and Guidance Values, October 22, 1993.

(2) NYSDOH Drinking Water Supply MCLs, January 5,1993.

"HP" designates hydropunch groundwater sample collection

"--" designates that compound was not detected above the criteria

"N/A" designates no samples were collected

"E" - the reported value is estimated due to quantitation above the calibration range

"J" - the associated numerical value is an estimated quantity

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location, MW-6S, but did not exceed NYSDOH drinking water criteria. Toluene, ethylbenzene and xylene each exceeded both the DEC groundwater criteria and NYSDOH drinking water criteria at various locations, including hydropunch locations.

The highest concentration of trichloroethene (TCE) was found in the on site well, K-2, and lower concentrations were found downgradient of the site. This suggests that the Korkay site is the source of the TCE contamination, and that the TCE is migrating offsite with groundwater flow. Both DEC groundwater criteria and NYSDOH drinking water standards for TCE were exceeded at several downgradient locations, including the hydropunch locations.

The highest concentrations of tetrachloroethene (PCE) were found in the downgradient hydropunch location HP-1 and HP-4. However, PCE was found in the on site groundwater, and in on site soils. Therefore, the data suggest that Korkay is a source of PCE contamination, that PCE is migrating off site with groundwater flow, and that another PCE source may exist. PCE exceeded the DEC groundwater criteria and the NYSDOH drinking water standard at one on site location and two downgradient hydropunch locations.

The highest concentrations of 1,2-dichloroethene were found to be at MW-6S, immediately downgradient of the site, and HP-2. It was also found in the on-site groundwater, therefore the Korkay site is believed to be a source of this contamination. An additional source may exist downgradient of the site. 1,2-dichloroethene exceeded the DEC groundwater criteria and the NYSDOH drinking water standard at several locations, including hydropunch locations.

1,1-dichloroethane was found in only one groundwater sample, MW-6S, and did not exceed DEC or NYSDOH standards. Carbon disulfide was detected only in HP-1 and did not exceed standards. A downgradient source(s) of these contaminants is likely since onsite soil samples did not contain these compounds.

In addition to the target VOCs, several tentatively identified compounds (TICs) were detected. The predominant TICs consisted primarily of benzene-related compounds (ethylmethylbenzene, trimethylbenzene, methylpropylbenzene, diethylbenzene, ethyldimethylbenzene). These compounds were detected in wells K-2, MW-5S, and MW-6S, and several hydropunch locations. They were not detected in upgradient well MW-4S. The total concentration of these benzene compounds was found to be up to several hundred ppb. The source is believed to be the site and/or a nearby downgradient source.

Semi-Volatile Organic Compounds

The target SVOC compounds detected during Phase II RI sampling in the shallow water bearing unit, and the locations where they were detected, are listed below:

CONTAMINANT	GROUNDWATER SAMPLE LOCATION(S)									
	<------ ON SITE ---------->			<---------- OFF SITE---------->						
PHENOL	MW-K2					HP-2	HP-3			
1,3-DICHLOROBENZENE					HP-1					
1,4-DICHLOROBENZENE				MW-6S	HP-1	HP-2	HP-3			
1,2-DICHLOROBENZENE				MW-6S	HP-1	HP-2	HP-3	HP-4		
4-METHYLPHENOL	MW-K2		MW-5S	MW-6S						
2,4-DIMETHYLPHENOL				MW-6S		HP-2				
NAPHTHALENE	MW-K2		MW-5S	MW-6S	HP-1	HP-2				
2-METHYLNAPHTHALENE	MW-K2		MW-5S	MW-6S		HP-2				
DIMETHYL PHTHALATE	MW-K2									
ACENAPHTHENE	MW-K2									
DIETHYLPHTHALATE	MW-K2			MW-6S				HP-4		
FLUORENE	MW-K2									
PHENANTHRENE									HP-SEEP	
DI-N-BUTYLPHTHALATE	MW-K2		MW-5S	MW-6S						
FLUORANTHENE									HP-SEEP	
PYRENE									HP-SEEP	
BUTYLBENZYLPHTHALATE	MW-K2		MW-5S							
BENZO(A)ANTHRACENE									HP-SEEP	
CHRYSENE									HP-SEEP	
BIS(2-ETHYLHEXYL)PHTHALATE					HP-1				HP-SEEP	
BENZO(B)FLUORANTHENE									HP-SEEP	
BENZO(K)FLUORANTHENE									HP-SEEP	
BENZO(A)PYRENE									HP-SEEP	

No SVOC contaminants were found in the upgradient monitoring well. Therefore, contaminants found are not believed to be from background sources. The Korkay site is believed to be the source of several contaminants. In some cases additional downgradient sources may exist, as discussed further below.

Naphthalene and di-n-butylphthalate exceeded DEC groundwater criteria and NYSDOH drinking water standards both on and off site (downgradient). Both compounds were also found in the on site soils. The Korkay site is believed to be the source of contamination. The highest concentrations are off site at MW-6S, therefore an additional downgradient source is possible. Naphthalene has been found as far downgradient as the hydropunch locations, but did not exceed standards at these locations.

Benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene and benzo(a)pyrene were only detected at the seep, where they exceeded the DEC groundwater standards. Although these compounds were all found in the on site soils, they were not detected in the on site groundwater. Since they were only present in the groundwater farthest downgradient of the site at the seep location the source of these compounds in the groundwater downgradient is not

certain. It could be originating from the Korkay site, or from another source downgradient of Korkay.

1,4-dichlorobenzene and 1,2-dichlorobenzene and 2,4-dimethylphenol were detected downgradient of the site in MW-6S and one or more HP locations. 2,4-dimethylphenol exceeded the NYSDOH drinking water criteria at MW-6S. 1,4 dichlorobenzene exceeded the DEC groundwater standard and NYSDOH drinking water standard at HP-1. 1,2 dichlorobenzene exceeded the DEC groundwater and NYSDOH drinking water standards at MW-6s and three HP locations. These compounds have not been found in the on site soils or groundwater. They are present only in the groundwater downgradient of the site, suggesting a downgradient source.

None of the remaining SVOC compounds detected in the groundwater exceeded DEC or NYSDOH standards. Phenol, 2-methylnaphthalene and butylbenzylphthalate have been found in the site soils and groundwater. The former two compounds have migrated off site in the groundwater, as far as the hydropunch locations. The source of these three compounds is believed to be the Korkay site.

Bis(2-ethylhexyl)phthalate, pyrene, fluoranthene, and phenanthrene have been found in the site soils but were detected only in the groundwater samples farthest downgradient of the site. Therefore, the source of these chemicals in the groundwater is not certain.

The source of 4-methylphenol, dimethyl phthalate, acenaphthene, diethylphthalate, and fluorene is believed to be the Korkay site because they are found in the on site wells. However, they have not been found in the site soils. 4-methylphenol and diethylphthalate have migrated off site.

1,3 dichlorobenzene was not found in the site soils and was found in only one groundwater sample, HP-1. The source of this contaminant is not known.

In addition to the target SVOCs, several TICs were identified in the library searches. Predominant TICs include propylene glycol (2 ppb), benzeneacetic acid or phenylacetic acid (37 ppb), propanoic acid (3 ppb), benzoic acid methyl ester (up to 42 ppb), phenols (hundreds of ppb total), and other compounds. These predominant TICs were found in the monitoring wells and several were found in hydropunch samples. Several TICs including propylene glycol and propanoic acid were detected in the upgradient monitoring well.

Pesticides/ PCBs

No PCBs were detected in any of the groundwater samples collected during Phase II RI sampling.

The pesticides detected during Phase II RI sampling, and their locations, are provided in the table below:

CONTAMINANT	GROUNDWATER SAMPLE LOCATION(S)									
	<---------- ON SITE ---------->				<---------- OFF SITE---------->					
ALPHA-BHC						HP-1				HP-SEEP
BETA-BHC								HP-3		
GAMMA-BHC (LINDANE)	MW-K2				MW-6S	HP-1	HP-2			
ALDRIN	MW-K2				MW-6S					
HEPTACHLOR EPOXIDE	MW-K2									
ENDOSULFAN I	MW-K2			MW-5S						
DIELDRIN	MW-K2			MW-5S						
4,4'-DDE	MW-K2			MW-5S						HP-SEEP
ENDRIN, TOTAL	MW-K2			MW-5S						
ENDOSULFAN II							HP-2	HP-3		
4,4'-DDD	MW-K2									
4,4'-DDT	MW-K2		MW-4S							
ENDRIN KETONE							HP-2			
ALPHA-CHLORDANE	MW-K2			MW-5S						
GAMMA-CHLORDANE	MW-K2			MW-5S	MW-6S					

Only one pesticide, 4,4 DDT, was detected in the upgradient monitoring well MW-4S sample. Background pesticide contamination appears to be minor.

Endrin (total), heptachlor epoxide, dieldrin, 4,4-DDE, 4,4-DDD, 4,4-DDT and gamma chlordane exceeded the DEC groundwater criteria in the on site groundwater. Endrin also exceeded the NYSDOH drinking water criteria on site. These pesticides have all been found in the site soils and the distribution of all but one in the groundwater indicates that their source is the Korkay site. The exception, 4,4-DDT, is more highly concentrated in the background well sample, thus its presence in the groundwater cannot be attributed solely to Korkay. 4,4-DDE also exceeded the DEC groundwater standard at the seep. Gamma chlordane has been detected offsite at MW-6S below the standards.

Alpha chlordane has been found in the on site soils and in on site well MW-5S and K-2. Gamma-BHC (Lindane) has been found in the on-site soils and in wells K-2, MW-6s and two HP locations. Korkay is believed to be a source of these contaminants but they have not exceeded any criteria.

Endosulfan I and aldrin were found in on site monitoring wells. Aldrin has also been detected in the downgradient groundwater at MW-6S. Although these contaminants have not been found in the on site soils, their presence in the on site wells and absence from the upgradient wells suggest that Korkay is the source. Both compounds have exceeded the DEC groundwater criteria.

Beta-BHC and Endosulfan II have been detected in the site soils but have been only detected in the groundwater samples farthest downgradient. They have not exceeded standards and it is not certain whether their occurrence in these groundwater samples is related to Korkay.

Alpha-BHC, and endrin ketone have not been found in the site soils and were only found in the groundwater samples farthest downgradient. Therefore, their presence in the groundwater cannot be attributed to Korkay.

TAL metals

Of the 23 TAL metals, 22 were detected in the total metals samples collected during the Phase II RI, including aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc. Several of these were also detected in the dissolved metals samples. Antimony was not detected in any total metals samples, but was detected in one dissolved metals sample.

Metals are natural constituents in groundwater because they are leached from the minerals in the soil. To evaluate potential contamination by metals requires that the natural occurrence of these metals be considered. Thus, comparison to background groundwater concentrations and regional water quality data is essential. As comprehensive regional water quality data is unavailable for this shallow unit, similar to the initial phase RI work, the groundwater data from the well upgradient of the site has been used for comparison purposes. Since the concentration of metals is likely to be somewhat naturally variable, the data must be reviewed with caution. The hydropunch samples were intended for groundwater screening purposes only. They were generally more turbid than the groundwater samples collected from the shallow monitoring wells. Since increased turbidity commonly causes higher metals concentrations due to higher solids content in turbid samples, the hydropunch sample results are not directly comparable to the monitoring well sample results. In addition, no dissolved metals samples were collected during the hydropunch work; therefore, metals concentrations in the hydropunch samples were not considered in the following evaluation except where noted.

There are no DEC or NYSDOH criteria for dissolved metals analysis. For purposes of determining site impact to groundwater, the dissolved metals concentrations are compared to the DEC groundwater and NYSDOH drinking water standards. Dissolved concentrations better simulate drinking water conditions because low turbidity is assured. If total metals results are used, water too silty for drinking could result in elevated metals due to the silt.

Of the metals detected in groundwater samples, only iron, manganese, sodium, thallium, and antimony exceeded standards in the filtered samples from the shallow water bearing unit. Of these, the thallium and antimony data are suspect because they were not detected in the unfiltered samples. Iron, manganese, and sodium are particularly common in groundwater. DEC has found high levels of iron in samples collected in the vicinity of the study area and local water supply wells have occasionally had elevated iron and manganese. Since there is no history of metals discharge at the Korkay site, these metals are believed to be naturally occurring in the groundwater.

4.3.2 Deep Water Bearing Unit(s)

Volatile Organic Compounds

Three VOC compounds were detected in samples collected from the deep wells during Phase II RI sampling. Ethylbenzene and total xylene were detected in well MW-7D. Trichloroethene was detected in wells MW-6D and MW-7D. Only one detection exceeded standards: total xylene in MW-7D slightly exceeded both the DEC groundwater and NYSDOH drinking water standards. Although these compounds have been found in the shallow water bearing unit and the on site soils, a significant aquitard separates the deeper zone. Up to now, since no significant organic contamination has been detected in the deep wells, hydrogeologic and background groundwater quality conditions [e.g., whether or not all the deep wells are in the same unit and which direction is gradient in this unit(s)] have not been studied to evaluate the potential source(s) of this type of contamination in the deeper water bearing unit.

The target VOCs detected during Phase II RI sampling, and their locations, are provided in the table below:

CONTAMINANT	GROUNDWATER SAMPLE LOCATION(S)									
	<------ ON SITE ---------->			<- OFF SITE-->						
TRICHLOROETHENE			MW-7D	MW-6D						
ETHYLBENZENE			MW-7D							
XYLENE(TOTAL)			MW-7D							

In addition to the target VOCs, predominant TICS detected include trimethylbenzene and ethylmethylbenzene in MW-7D at a total concentration of 17 ppb. To confirm the presence of organics in the deeper unit, two on site deep wells were resampled by the DEC, where results indicate that no VOC compounds were detected in either sample collected (see page 4-41).

Semi-Volatile Organic Compounds

Three SVOC compounds have been found in the groundwater in the deep unit(s). Diethylphthalate was detected in MW-5D; di-n-butylphthalate was found in MW-4D, MW-6D and MW-7D; and butylbenzylphthalate was detected in MW-6D. Di-n-butylphthalate slightly exceeded DEC groundwater and NYSDOH drinking water standards in MW-6D and MW-7D. It is difficult to evaluate the source of this contamination for similar reasons as stated above.

The target SVOCs detected during Phase II RI sampling, and their locations, are provided in the table below:

CONTAMINANT	GROUNDWATER SAMPLE LOCATION(S)									
	<------- ON SITE ---------->			<- OFF SITE-->						
DIETHYLPHTHALATE		MW-5D								
DI-N-BUTYLPHTHALATE	MW-4D		MW-7D	MW-6D						
BUTYLBENZYLPHTHALATE				MW-6D						

In addition to the target SVOCs, predominant TICs detected in several deep wells include propylene glycol (up to 79 ppb), propanoic acid (up to 7 ppb), dodecanoic acid (up to 50 ppb), and tetradecanoic acid (up to 13 ppb).

Pesticides/ PCBs

No pesticides or PCBs were detected in the deep water bearing unit(s).

TAL metals

Aluminum, arsenic, barium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, vanadium and zinc were found in unfiltered groundwater samples collected from the deep monitoring wells. Of these, all but cobalt, copper, lead, nickel, and selenium were also found in filtered samples. In addition, thallium was found in one filtered sample, but not in any total metals samples.

Iron exceeded both the DEC and NYSDOH standards in several samples, both dissolved and total. Total and dissolved sodium both exceeded the DEC groundwater standard in several samples. These metals are believed to be naturally occurring. No other filtered metals samples exceeded DEC standards in the deep water bearing unit.

Thallium exceeded the NYSDOH drinking water standard in the filtered sample from MW-4D. However, it was not found in the totals metals sample, therefore its presence in the groundwater is suspect.

Nature and Extent

As found during the initial phase RI, the quality of the uppermost water bearing unit (wells K-2, MW-5S, and MW-6S) is characterized as contaminated with similar organics found in the soil samples. Soil in Areas 1 and 2 appear to be source areas of organic (VOCs, SVOCs, pesticides) contamination, and the soils in area 3 appear to be a source area of pesticide contamination. The organic contamination in the soil has migrated into the uppermost water bearing unit.

In the preliminary site assessment work conducted by DEC in the mid-1980s, well K-2 was shown to be contaminated during the previous investigations with acetone, 1,1,1-trichloroethane, o- and p-xylene, trichloroethylene, and chlordane. However, similar to the initial phase RI findings, acetone and 1,1,1-TCA were not detected in the recent sample from well K-2, as these may have migrated away from the site or have been diluted to below method detection limits.

Well K-2, located in Area 1, is where the most highly contaminated soils have been found. However, MW-5S, which is located in Area 2 in a former drum storage area along the wooden fence, is more contaminated with organic compounds than well K-2. Although MW-5S is "upgradient" of K-2, a possible explanation of why the "upgradient" well MW-5S is more contaminated than K-2 when soils in Area 1 are more contaminated than soils in Area 2, could include conveyance of contaminated runoff from Area 1, through the subsurface storm drain system, to a dry well in the rear of the property(refer to Figure 1-2 of this report). Most of the

organic contamination in groundwater is at an even higher concentration in MW-6S, which is located off-site across West Main Street, and is located "downgradient" of the Area 1 soils.

As reported in the initial phase RI report, based on historical information indicating "poor housekeeping" at the site, it is believed that surface spills, discharges, and leaking drums onto or into the ground are the cause of the soil contamination, and thus the shallow water contamination. The source of pesticides is not documented, although may be attributable to use of such compounds over the years. However, pesticides typically have very low solubilities and are typically detected less frequently in groundwater.

The Phase II RI work confirms the findings from the earlier work : that based on the flow direction of the shallow zone, organic contamination has migrated off-site to well MW-6S located across West Main Street and beyond as indicated by several of the hydropunch samples. Comparing concentrations in MW-6S to K-2, VOCs are now generally found at higher concentrations off site. Similar to earlier findings, SVOCs are at higher concentrations off-site. Pesticides have also now been detected in the off-site well MW-6S.

During Phase II sampling, several organic compounds were detected in the groundwater samples collected in the deeper water bearing unit. The silty clay materials present at the site potentially limits the rate at which contaminants migrate vertically. It appeared that the presence of xylene in MW-7D at 12 ppb, which is downgradient of Area 1, suggested that vertical migration may be occurring. Di-n-butylphthalate (54 ppb in MW-7D and 66 ppb in MW-6D) had also been detected above DEC criteria in the deep wells, but this is a ubiquitous pollutant and a known laboratory contaminant. To confirm the presence of organics in the deeper unit, two on site deep wells, MW-7D and MW-5D, were resampled by the DEC personnel on April 14, 1995. Samples for VOC analysis were collected. DEC's results indicate that no VOC compounds were detected in either sample collected. Of three sampling episodes at well MS-7D, two have revealed no organic contamination above DEC and NYSDOH standards. It is likely that the one sampling episode detecting organics may have been due to outside factors such as cross-contamination during sample collection or sample analysis.

In general, dissolved iron and sodium are elevated in the deep wells and dissolved iron, manganese, and sodium are elevated in the shallow wells. They are believed to be naturally occurring.

4.4 Surface Water and Sediment

Kennyetto Creek was sampled in three locations. Three surface water and three sediment samples numbered SW1, SW2, SW3 and SD1, SD2, and SD3, respectively, were collected.

Quality assurance samples collected during creek sampling included a surface water duplicate sample (SW-4), a sediment duplicate sample (SD-4), a trip blank for the aqueous sample, a surface water field blank sample (FB2), and a sediment field blank (FB3). The quality assurance samples were collected at sample SW-2/SD-2. As discussed in Section 3 of this report, the sample locations were determined in the field with DEC personnel and are shown on Figure 4-1.

Volatile Organic Compounds

Trichloroethene was detected in one of three surface water samples (**SW1**) at 28 ppb, which is above DEC criteria of 11 ppb, for Class C surface water. During the creek sampling event, SW1 was selected as the "upstream" location.

Trichloroethene was also detected in one of three samples (**SD2**) at 15 ppb, below DEC TAGM soil criteria. Location SD2 was selected as the "center" location, adjacent to the seep inlet to Kennyetto Creek.

A summary of the detected compounds in the surface water and sediment samples is presented in Appendix G. A summary of the number of detections and number of samples exceeding limits is presented in Appendix H.

Semi-Volatile Organic Compounds

One SVOC compound, bis(2-ethylhexyl)phthalate, was detected in one of three surface water samples (SW-3) at 1 J ppb, in excess of the DEC criteria of 0.6 ppb.

SVOC compounds were detected in all three sediment samples collected, below DEC TAGM soil criteria. SVOC compounds detected include:

- o phenanthrene,
- o di-n-butylphthalate,
- o fluoranthene,
- o pyrene,
- o benzo(a)anthracene,
- o chrysene,
- o bis(2-ethylhexyl)phthalate,
- o benzo(a)pyrene.

Contaminated sediment samples include:

SD1: di-n-butylphthalate 3,200 ppb, fluoranthene at 47 J ppb, pyrene at 36 J ppb, and bis(2-ethylhexyl)phthalate at 59 J ppb.

SD3: di-n-butylphthalate 4,200 ppb.

SD4 (duplicate of SD2): phenanthrene at 45 J ppb, fluoranthene at 74 J ppb, pyrene at 69 J ppb, benzo(a)anthracene at 41 J ppb, chrysene at 42 J ppb, bis(2-ethylhexyl)phthalate at 26 J ppb, and benzo(a)pyrene at 31 J ppb.

A summary of the detected compounds in the surface water and sediment samples is presented in Appendix G. A summary of the number of detections and number of samples exceeding limits is presented in Appendix H.

Pesticides/ PCBs

No pesticides or PCBs were detected in the surface water samples collected in Kennyetto Creek.

Pesticides were detected in two of the three sediment samples collected in Kennyetto Creek, and are below DEC TAGM soil criteria. No PCBs were detected. The pesticide compounds include:

- o aldrin,
- o dieldrin,
- o endrin (total).

Contaminated sediment samples include:

SD1: dieldrin at 0.66 JN ppb and endrin (total) at 0.72 JN ppb.

SD3: aldrin at 0.33 JN ppb, dieldrin at 0.75 J ppb, and endrin (total) at 0.93 JN ppb.

A summary of the detected compounds in the surface water and sediment samples is presented in Appendix G. A summary of the number of detections and number of samples exceeding limits is presented in Appendix H.

TAL metals

A variety of metals were detected in all of the surface water samples collected in Kennyetto Creek. Metals detected include aluminum, barium, calcium, iron, lead, magnesium, manganese, nickel, potassium, and sodium. Those metals exceeding the surface water criteria for Class C streams include aluminum, iron, and lead.

A variety of metals were detected in all of the sediment samples collected in Kennyetto Creek. TAL metals were detected above the site background and DEC TAGM soil cleanup criteria in the sediment. Metals exceeding criteria in the sediment include magnesium, manganese, mercury (in sample SD3), and potassium.

A summary of the detected compounds in the surface water and sediment samples is presented in Appendix G. A summary of the number of detections and number of samples exceeding criteria is presented in Appendix H.

Nature and Extent

The quality of the surface water and sediment in Kennyetto Creek is not "pristine". While TCE, also found at the Korkay site, was detected in a surface water sample, this location is "upstream" of where the seep was observed to intersect the creek. Thus, there may be other contributors to surface water contamination located upstream. The TCE concentration found in the sediment sample is low and is below the DEC's TAGM soil criteria.

The SVOC compound found in the surface water may be attributable to sample collection or sampling handling in the laboratory. The SVOC compound detected in the sediment, below the DEC's TAGM soil criteria, are similar in nature to those found on site. However, additional sources of SVOCs may exist in the area between Korkay and the creek.

No pesticides were detected in the surface water, and were found at low levels in sediment samples.

The metals detected in the surface water and the sediment are similar in nature to those found in the soil samples. Some of the metals concentrations are similar to glacially-derived soils and are likely due to natural concentrations.

It is unlikely that the Korkay site is the sole source of contamination found in surface water and sediment samples collected from Kennyetto Creek, since contamination was also found in the "upstream" samples. It was further observed that the shallow water bearing unit discharges prior to reaching the creek, although it may run off into the creek. There are likely other source contributors.

[M:\kork-ri\sec4b2.wpc]

Section 5
Phase II Field Investigation Findings

5.1 Soil Investigation Findings - Stratigraphy

The Phase II supplemental subsurface soil investigation was limited to the shallowest stratigraphic layer/water bearing zone at the site. Based on Phase I RI activities, no significant impacts of organic contamination detected at the Korkay site were found in the deeper water bearing zone. Therefore, any further extensive study of the deeper strata during Phase II was considered unwarranted.

The Phase II RI soil boring program generally confirmed the shallow stratigraphy found during the Phase I RI. The shallow stratigraphic unit consists primarily of fine to medium sand, with occasional lenses of fine sand or silt. In addition, several lenses of medium to coarse sand, and occasionally gravel, were found during the Phase II investigation. These occur primarily above the water table. As reported in the Phase I RI report of April 1994, the shallow stratigraphic unit grades into the underlying silty clay. The transition is seen in the bottom two to three feet of the shallow unit; their formation is siltier and the sand size ranges from fine to very fine.

The thickness of the shallow stratigraphic unit, measured from ground surface to the top of the silty clay, was found to range from about 10 to 11 feet in the north (soil borings SB-3 and SB-4, respectively), to about 13 to 14 feet in the south (soil borings SB-1 and SB-2, respectively). These thicknesses were predicted by the stratigraphic cross sections as shown in Figures 5-1, 5-2, 5-3, and 5-4. These stratigraphic cross sections, which are based on initial phase well drilling activities, were re-evaluated and slightly modified as presented in this report.

The saturated thickness of the shallow water bearing zone, measured from the water table to the top of the silty clay, ranged from about 4 feet in the north (soil borings SB-3 and SB-4), to about 5 to 6 feet in the south (soil borings SB-1 and SB-2, respectively). It should be noted that the bottom one to two feet of the zone is finer and siltier than the shallower part. Therefore, groundwater flow is likely to occur preferentially in the shallower part. Groundwater flow is discussed further in Section 5.2.

The results of the two shelby tube samples and other geochemical and geotechnical samples collected at the site are provided in Appendix I of this report (refer to Tables 5-1 and 5-2).

The geochemical data collected will be used primarily during detailed analysis of alternatives for remediation of the site. Since numerous factors affect the potential viability of selected remedial actions, during this Phase II RI, soil properties and geochemical data collected

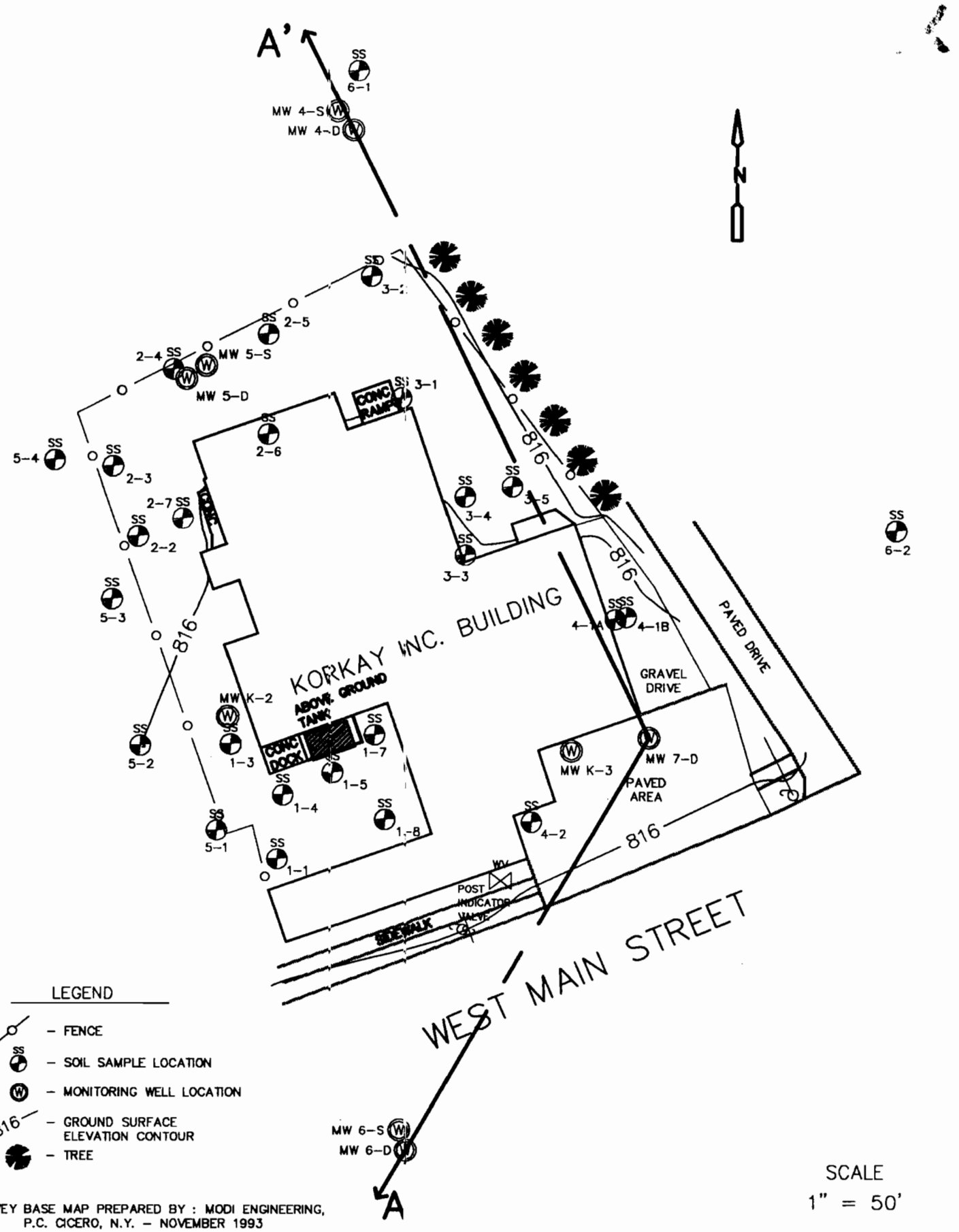

Figure 5-1

CROSS SECTION A–A' LOCATION MAP

Korkay Inc. Site – Broadalbin, New York

NYSDEC Site #5-18-014

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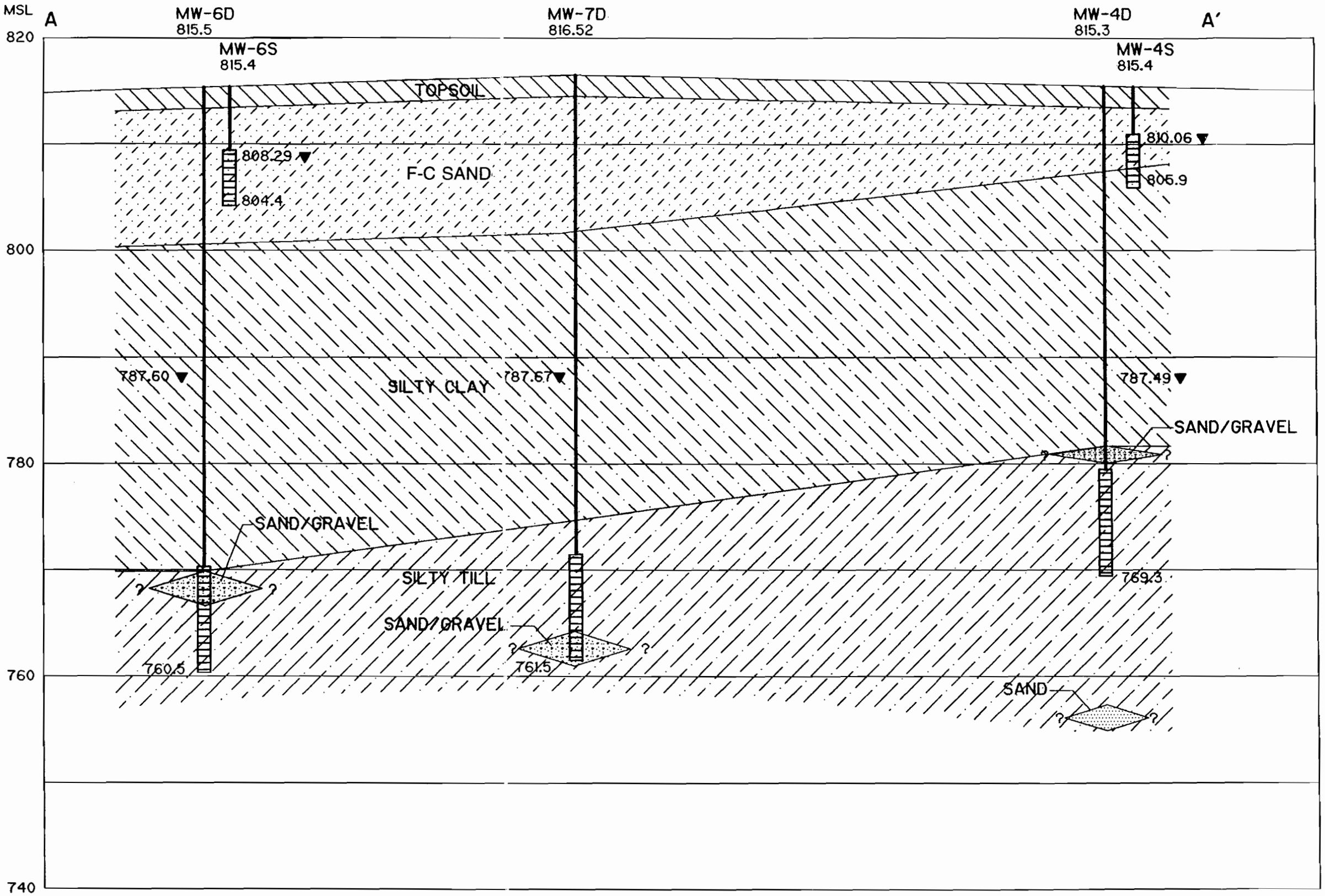

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Vertical Scale: 1" = 10'

Horizontal Scale: 1" = 50'

Figure 5-2

Geologic Cross Section A-A'

Korkay Inc. Site - Broadalbin, New York
NYSDEC Site #5-18-014

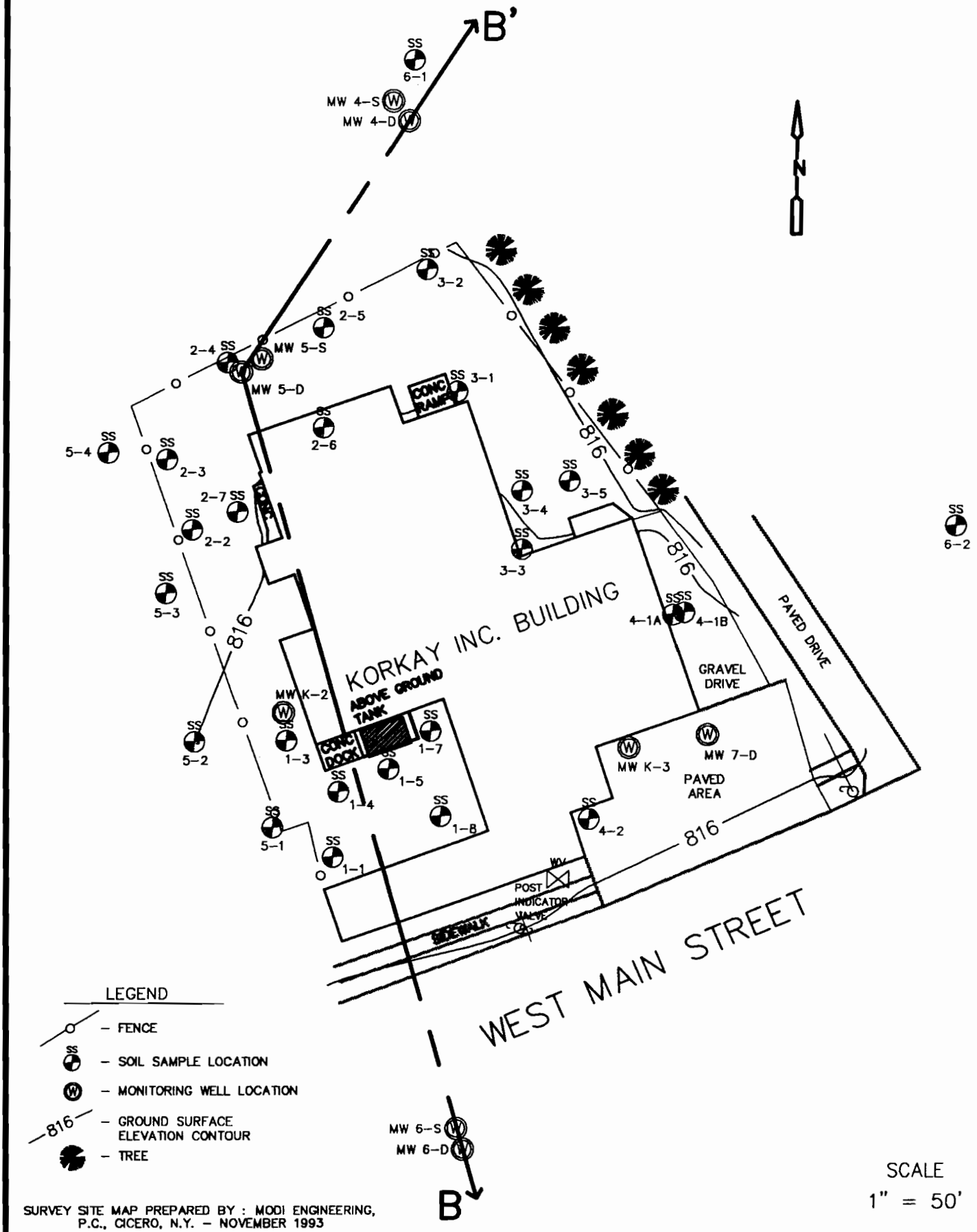

Figure 5-3

CROSS SECTION B–B' LOCATION MAP

Korkay Inc. Site – Broadalbin, New York

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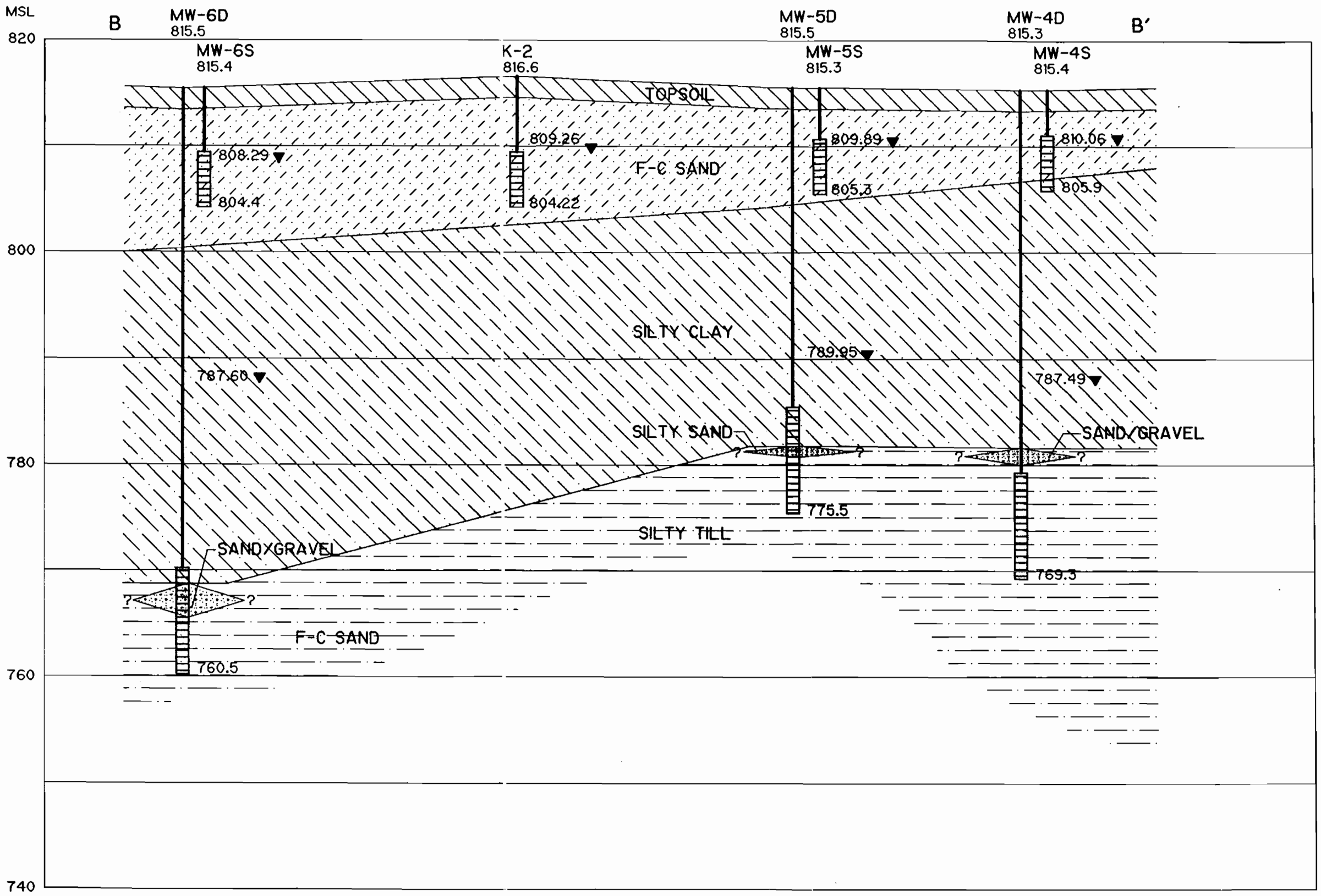

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Vertical Scale: 1" = 10'

Horizontal Scale: 1" = 50'

Figure 5-4

Geologic Cross Section B-B'

Korkay Inc. Site - Broadalbin, New York
NYSDEC Site #5-18-014

included grain size analysis, soil moisture, clay mineral content, organic content and TOC, soil classification, redox potential, soil pH, cation exchange capacity, aerobic and anaerobic soil microbiota counts, nutrient availability and C:N:P ratios, bulk density, and porosity.

Organic matter affects contaminant mobility primarily due to its high sorptive capacity; cation exchange capacity is a measure of the soil's ability to absorb and release cations, and is important at sites contaminated with heavy metals; soil pH is a measure of hydrogen ion activity in the soil; redox or oxidation-reduction potential, Eh, is a measure of whether soil conditions are oxidizing/aerobic or reducing/anaerobic, which can affect contaminant degradation processes; microorganisms in soil, both aerobic and anaerobic, are recognized as being of importance in affecting the transformation and fate of some organic contaminants and heavy metals; and, particularly for natural biodegradation, microbial metabolism and growth is dependent upon the availability of essential nutrients in a usable form, appropriate concentration, and in proper ratios, where carbon, nitrogen, and phosphorous are essential nutrients.

In general, based on the data from the two soil samples collected, the site soil has low organic content (<0.5%), neutral soil pH (from 7.18 to 7.38), redox potential indicating intermediate to highly oxidized conditions (330 to 460 mV), low cation exchange capacity (<4 meq/100g), a common abundance class of indigenous soil microbiota (aerobic 69,000 to 460,000 and anaerobic 60,000 to 104,000 colony forming units per gram soil), a carbon-to-nitrogen ratio by weight of approximately 21:1, and medium bulk density (<1.6 g/cc).

The grain size distribution curves, constructed from both sieve and hydrometer tests, are provided in Appendix I of this report, for three soil samples collected. These test results confirm the descriptions of the shallow stratigraphic unit discussed above. In soil boring SB-2, one sample was collected from a medium to coarse sand at 6-to-6.7 feet below grade, and the other from fine to medium sands at 6.7-to-7.5 feet below grade. In soil boring SB-3, a third sample was collected from a fine/sand silt lense at 7-feet below grade, which proved to be primarily coarse silt (34 to 75 microns).

Assuming that the materials in the shelby tubes are similar to those encountered in the corresponding test borings, the shelby tube at soil borings SB-2 consists of fine to medium sand, and the shelby tube at soil boring SB-3 consists of medium to coarse sand. As shown in Appendix I of this report (refer to Table 5-2), the USDA soil classification for SB-2 is "sand" and for SB-3 is "coarse sand". The total porosity values, 49% and 43%, respectively, are within the upper range generally found for these materials.

5.2 Hydrogeologic Characterization Findings

5.2.1 Shallow Unit

The effective porosity, hydraulic conductivity, and hydraulic gradient of a formation were characterized, to evaluate the direction and rate of groundwater flow in the shallow water bearing unit. Shelby tube samples were collected in the shallow strata, and slug tests were performed at two shallow wells, MW K-2 and MW-5S.

The shelby tube analysis (see Section 5.) and slug tests provided information regarding the total porosity and hydraulic conductivity of the shallow water bearing zone, respectively. Synoptic water level measurements were collected on October 25, 1994 to provide the necessary gradient information. Note that effective porosity, those pore spaces that are interconnected, is generally lower than the total porosity.

The slug test data were analyzed using the method of Bouwer and Rice (1976). The hydrographs for wells K-2 and MW-5S are provided in Appendix J of this report.

The hydraulic conductivity at the site was found to range from about 38 feet per day (K-2) to about 55 feet per day (MW-5S). Note that during the slug tests, the wells were likely recharged preferentially from the shallower, coarser part of the water bearing zone. There was probably very little recharge from the deeper, finer transitional strata just above the underlying aquitard. Therefore, these slug test results are considered representative of the shallower, coarser strata.

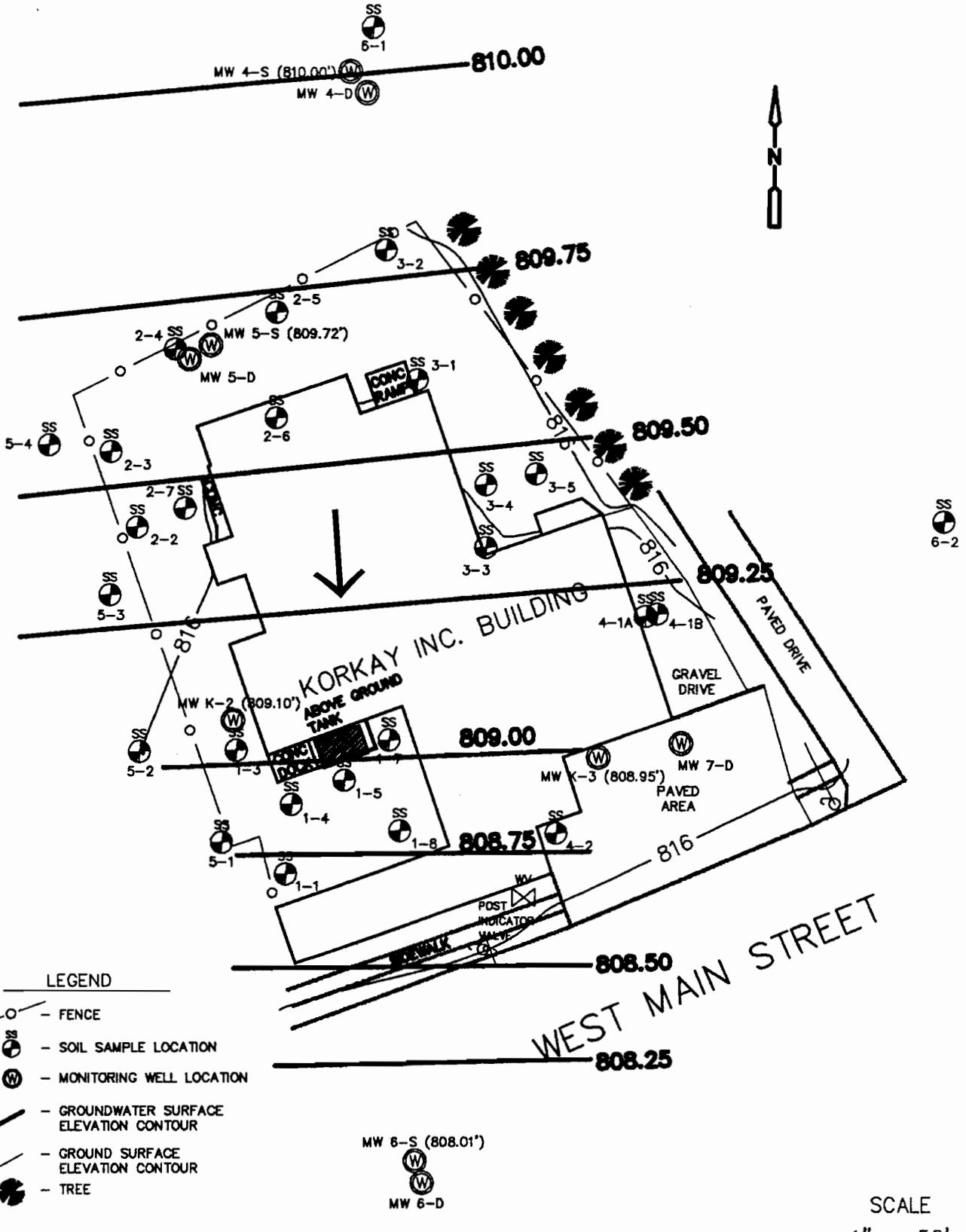
The results of the synoptic water level measurements of all groundwater wells at the site are provided in Appendix C of this report (refer to Table 3-5). A groundwater contour map constructed from this data, for the shallow water bearing zone, is provided in Figure 5-5. Similar to the Phase I RI findings, the groundwater flow direction of the shallow water bearing unit is generally south, toward Kennyetto Creek. In the shallow water bearing zone, the gradient is slightly steeper toward the southern edge of the study area than it is toward the north.

The linear groundwater flow rate can be calculated from the following formula:

$$V=Ki/p$$

where V is the linear groundwater velocity; K is the hydraulic conductivity; i is the hydraulic gradient; and p is the effective porosity

The following values of K, i and p were used to estimate the linear groundwater velocity, V, of the shallow water bearing zone. Hydraulic conductivity was taken as the average of the slug test results, 46.5 ft/day. The effective porosity was estimated as 40 percent, based on



SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 5-5

GENERALIZED FLOW OF SHALLOW WATER-BEARING UNIT – OCTOBER 1994

Korkay Inc. Site – Broadalbin, New York

NYSDEC Site #5-18-014

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the total porosity of 43 and 49 percent in the shelby tube samples. Gradient was found to range from about 0.0048 in the north to 0.0068 in the south. For this reason, groundwater velocities were calculated separately for the northern and southern portions of the site. The velocity was found to range from about 0.56 feet per day in the north to 0.79 feet per day in the south.

The slug test data and the porosity data represent the shallower, coarser part of the water bearing zone. Therefore, these groundwater flow velocities represent this strata, and do not represent the groundwater flow in the finer, deeper transitional strata just above the underlying aquitard. Groundwater flow is believed to occur more readily in the shallower strata because it is more permeable.

During the hydropunch investigation, CDM observed that the Kennyetto Creek valley truncates the full saturated thickness of the shallow water bearing zone. Thus, the groundwater discharges to the ground surface along the valley wall at seeps. Evidence of this discharge was also observed during the hydropunch investigation. The discharged water is believed to run off into the creek.

Figure 5-6 provides a conceptual flow model of the hydraulic relationships between the shallow water bearing zone and Kennyetto Creek. The discharge is believed to lower the water table along the discharge, similar to a cone of depression caused by a pumping well. Thus, the gradient steepens near the discharge. This is consistent with the gradients found in the northern and southern portions of the site.

The results of the two shallow water chemistry samples collected at the site are provided in Appendix I (refer to Table 5-3). This water chemistry data will be used primarily during detailed analysis of alternatives for remediation of the site. Since numerous factors affect the potential viability of selected remedial actions, during this Phase II RI, water chemistry data collected included chemical oxygen demand, hardness, pH, total dissolved solids, total suspended solids, color, total organic carbon, and turbidity.

5.2.2 Deep Unit

The results of the synoptic water level measurements from the deep wells are provided in Appendix C of this report (refer to Table 3-5). The deep well water levels at the Korkay site were measured on October 25, 1994. A groundwater contour map constructed from water levels in the four deep wells is provided in Figure 5-7.

The results of these contours must be used with caution due to the horizontal and vertical heterogeneity of the deep water bearing zone. However, the data suggests that groundwater flow is generally easterly in this zone. Three of the wells (MW-4D, MW-5D, and MW-6D) are screened at the top of the till and water levels from these three wells suggest groundwater

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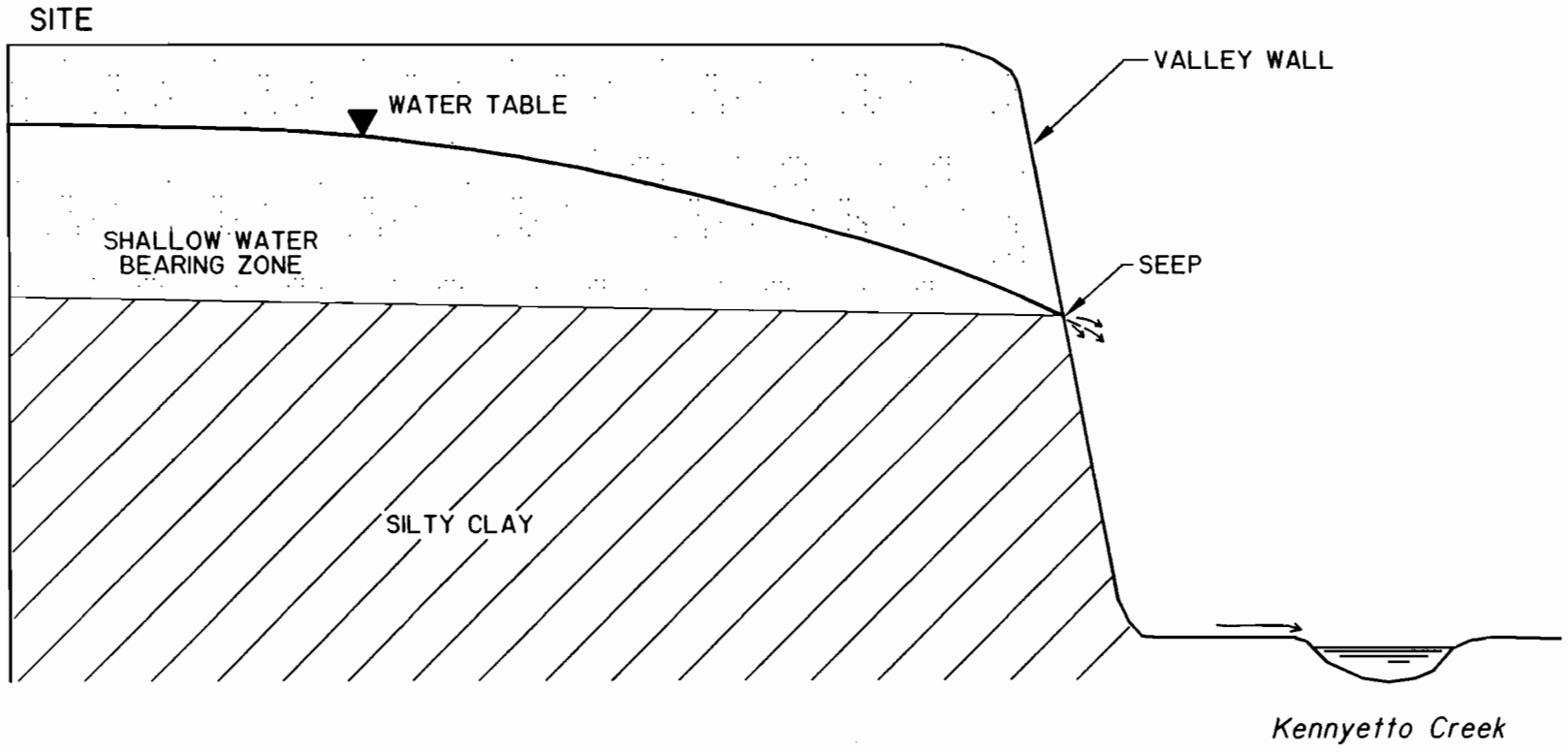

NOT TO SCALE

Figure 5-6

CONCEPTUAL FLOW OF
SHALLOW WATER BEARING ZONE

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

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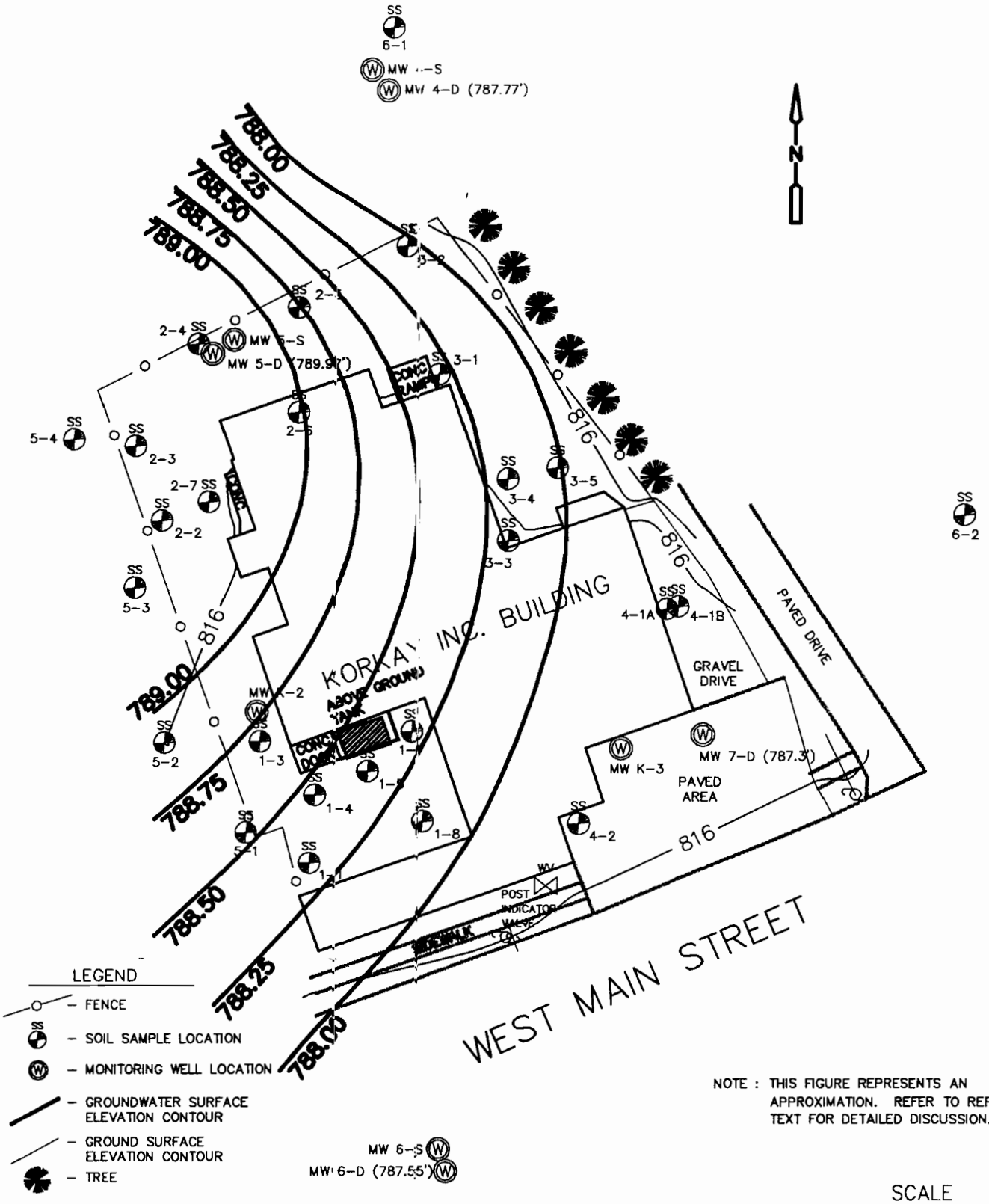

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 5-7

GENERALIZED POTENTIOMETRIC SURFACE MAP OF DEEP WATER-BEARING UNIT – OCTOBER 1994

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

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flow to the east. A fourth deep well, MW-7D, while screened stratigraphically deeper, also supports this finding. However, because of the heterogeneity, the easterly flow in the deep zone is considered an approximation.

5.3 Toxic Characteristic Soil Testing

During the Phase II RI work, two soil samples were collected primarily for the purposes of detailed feasibility study analysis to determine whether or not site soils would be classified as RCRA-hazardous, if disposed, based on toxic characteristics. The soil samples collected were analyzed by the toxic characteristic leachate procedure (TCLP) for the VOC, SVOC, pesticides/herbicides, and metals fractions.

The soil samples were collected from soil boring SB-2 (sample SB2A810 at 8 to 10 feet) located in Area 1 and soil boring SB-3 (SB3A7 at 7 feet and SB3A8 at 8 feet) located in Area 2. The most highly contaminated soils at the site appear to exist in Area 1, and to a lesser extent, in Area 2.

Results of the two TCLP soil samples are shown in Appendix I of this report (refer to Table 5-4). Based on the analytical results, the compounds that were detected are similar to those found in the soil from TCL/TAL metals analysis. However, their concentrations (in mg/l) indicate that the soil leachate levels do not exceed TCLP levels for RCRA-hazardous characteristic waste. This would suggest that, based on these samples, the soil in the vicinity of these sample locations would not be classified as RCRA-hazardous waste, if disposed, based on TCLP analysis.

5.4 SVE/CASVE Treatability Study Findings

See Appendix E of this report for a discussion of the SVE/CASVE treatability study findings.

[m:\kork-ri\sec5b.wpc]

Section 6
Conclusions and Recommendations

6.1 Conclusions

The data collected during this Phase II RI work completes the data collection needs which were identified at the conclusion of the initial phase RI, and re-confirms the findings from previous site investigations that past operations have resulted in contamination of the soils and underlying groundwater at the site.

Phase II data confirms that a number of organic constituents are present in the soils and groundwater, at concentrations that exceed NYS SCGs. Inorganic constituents present in the soils and groundwater at concentrations that exceed NYS SCGs, in general, are attributed to natural conditions. Phase II data collected also confirms that Kennyetto Creek water quality may not be "pristine".

Soils

In Area 1, it is concluded that VOC/SVOC concentrations exceeding DEC TAGM criteria generally occupies a layer estimated to be 5-feet thick straddling the shallow water table, from approximately 5 to 10 feet below grade. Around the concrete dock and aboveground tank, SVOC/VOC concentration exceeding DEC TAGM criteria is generally present from surficial soil to 10 feet in depth. Contamination below DEC TAGM soil criteria for VOCs and SVOCs has been determined at 12 to 14 feet below grade. During both RI phases, none of the pesticides/ PCBs were found to exceed DEC TAGM soil criteria in samples collected.

In Area 2, it is concluded that VOC/SVOC concentrations exceeding DEC TAGM criteria generally occupies a layer estimated to be about 4-feet thick straddling the shallow water table, from approximately 5 to 9 feet below grade. Contamination below DEC TAGM soil criteria for VOCs and SVOCs has been determined in the 6 to 8 and 8 to 10 foot samples, respectively. Surficial SVOC/VOC soil contamination is generally present in two of the seven samples collected. During both RI phases, pesticides/PCBs were found to exceed DEC TAGM soil criteria in surficial and subsurface soils. Pesticides/PCBs are present above DEC TAGM criteria generally in the first 6 to 8 feet of soil below grade in at least a portion of the area.

In Area 3, it is concluded that VOC/SVOC concentrations exceeding DEC TAGM criteria generally occupies a layer estimated to be 4-feet thick straddling the shallow water table, from approximately 5 to 9 feet below grade. Contamination below DEC TAGM soil criteria for VOCs/SVOCs has been determined at approximately 11-feet below grade. No surficial VOCs/SVOCs was detected. During both RI phases, pesticides/PCBs were found to exceed DEC TAGM soil criteria in surficial and subsurface soils. Pesticides/PCBs are present above DEC TAGM criteria generally in the first 6 to 8 feet of soil in at least a portion of the area.

In Area 4, no organic concentrations above DEC TAGM soil criteria were detected in Area 4.

Section 6
Conclusions and Recommendations

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Phase II data confirms that a number of organic constituents are present in the soils and groundwater, at concentrations that exceed NYS SCGs. Inorganic constituents present in the soils and groundwater at concentrations that exceed NYS SCGs, in general, are attributed to natural conditions. Phase II data collected also confirms that Kennyetto Creek water quality may not be "pristine".

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In Area 2, it is concluded that VOC/SVOC concentrations exceeding DEC TAGM criteria generally occupies a layer estimated to be about 4-feet thick straddling the shallow water table, from approximately 5 to 9 feet below grade. Contamination below DEC TAGM soil criteria for VOCs and SVOCs has been determined in the 6 to 8 and 8 to 10 foot samples, respectively. Surficial SVOC/VOC soil contamination is generally present in two of the seven samples collected. During both RI phases, pesticides/PCBs were found to exceed DEC TAGM soil criteria in surficial and subsurface soils. Pesticides/PCBs are present above DEC TAGM criteria generally in the first 6 to 8 feet of soil below grade in at least a portion of the area.

In Area 3, it is concluded that VOC/SVOC concentrations exceeding DEC TAGM criteria generally occupies a layer estimated to be 4-feet thick straddling the shallow water table, from approximately 5 to 9 feet below grade. Contamination below DEC TAGM soil criteria for VOCs/SVOCs has been determined at approximately 11-feet below grade. No surficial VOCs/SVOCs was detected. During both RI phases, pesticides/PCBs were found to exceed DEC TAGM soil criteria in surficial and subsurface soils. Pesticides/PCBs are present above DEC TAGM criteria generally in the first 6 to 8 feet of soil in at least a portion of the area.

In Area 4, no organic concentrations above DEC TAGM soil criteria were detected in Area 4.

In Area 5, the initial phase RI samples revealed that VOCs, SVOCs, and pesticides/PCBs found on the Hayes property were similar in nature to those compounds found at Korkay. Concentrations exceeding the DEC TAGM soil criteria were exceeded in three of the four 0 to 0.5 foot samples collected and in one of the four 1.5 to 2.0 foot samples collected. During the Phase II RI work, additional samples at greater depths were collected to vertically delineate the contamination. In these deeper samples, collected at 2 to 4 feet and 5 to 7 feet, detected values of organic compounds were relatively lower than those samples closer to the surface, and none of the values exceed the DEC TAGM soil criteria.

Concentrations of TCL organics to below DEC TAGM soil criteria have been delineated vertically in the areas of concern, meeting the objective of the Phase II RI work.

Approximate areal extent of TCL organic soil contamination exceeding DEC TAGM criteria, including VOC, SVOC, pesticides, and all of the organic fractions, is shown on Figures 6-1, 6-2, 6-3, and 6-4, respectively. The areal extent shown is approximated from sample point to sample point based on the initial phase and phase II RI data collected. However, concentrations between sample points may be more than or less than DEC TAGM criteria.

TAL metals were detected above DEC TAGM criteria in almost all of the soil samples collected at the site. With a few exceptions, they were found at concentrations within the range of naturally occurring metals in northeastern United States or background soil concentrations. DEC believes that, based on available site history information, use of metals was not part of the Korkay operations; therefore TAL metals are not considered to be primary contaminants of concern.

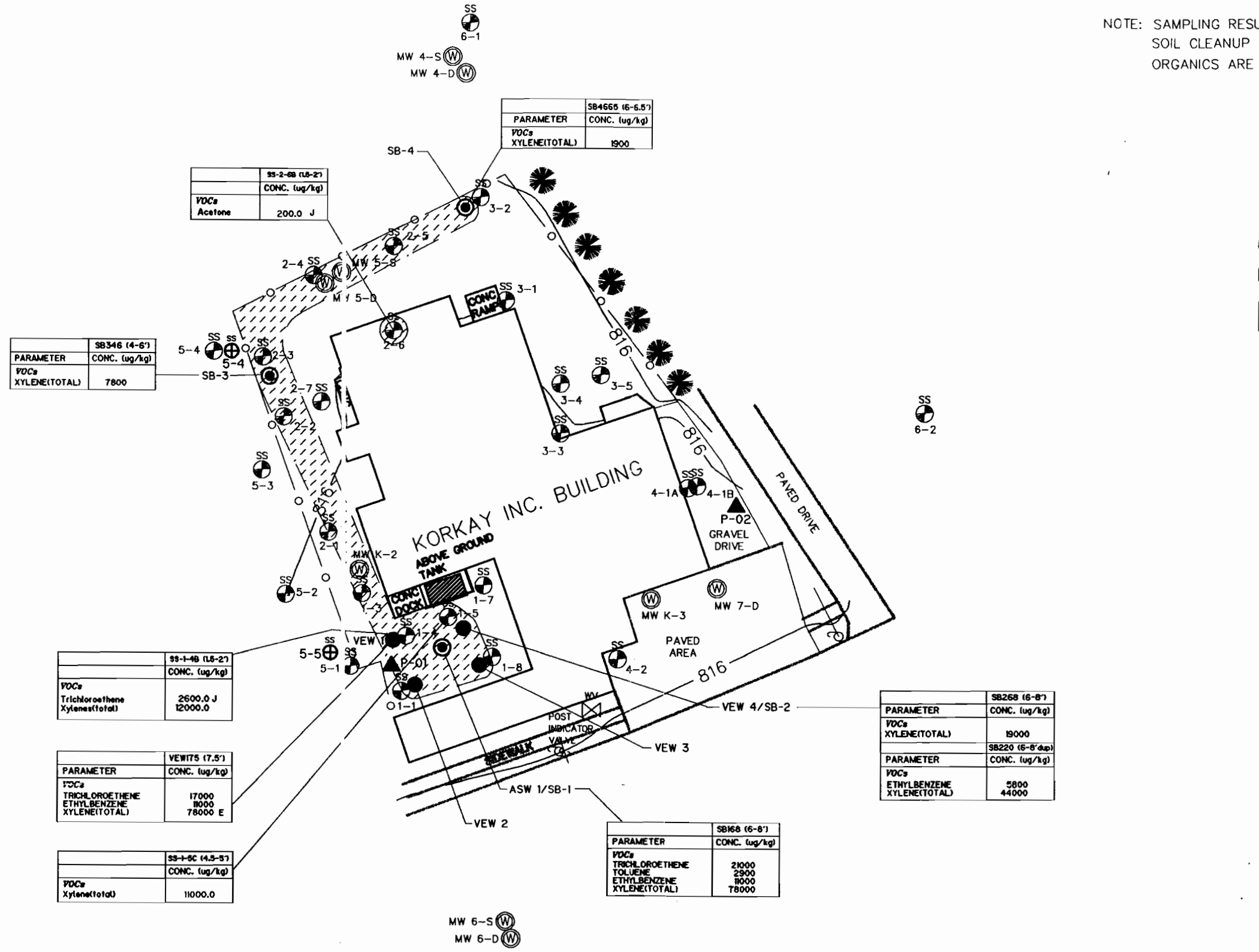
Background Samples: During the initial phase RI work, background samples were collected in Area 6, on the adjacent church property. Concentrations exceeding DEC TAGM soil criteria were detected in the background samples collected. DEC requested a new set of background samples be collected in an area free from the influences of hazardous waste sites or any other sources of contaminants. The new set of background samples collected during Phase II RI work also appear to have concentrations in excess of DEC TAGM soil criteria. However, these Phase II RI samples were collected even further away from the site than the earlier set of background samples. The concentrations found in these background samples would not appear to be related to the contamination found at the Korkay site. The background sample results were usable for comparison purposes, particularly for inorganic comparisons.

Specific chemicals of potential concern and detailed discussion about the nature and extent of contamination within each area of the site can be found in Section 4 of this report.

Groundwater

Similar to the Phase I RI findings, the groundwater flow direction of the shallow water bearing unit is generally south, toward Kennyetto Creek. In the shallow water bearing zone, the gradient is slightly steeper toward the southern edge of the study area than it is toward the north. The data collected in the deep water bearing zone suggests that groundwater flow is generally easterly in this zone. Three of the wells (MW-4D, MW-5D, and MW-6D) are screened at the top of the till and water levels from these three wells suggest groundwater flow to the

NOTE: SAMPLING RESULTS EXCEEDING DEC TAGM SOIL CLEANUP CRITERIA FOR VOLATILE ORGANICS ARE REPORTED IN THIS FIGURE.



	SS-2-6B (1.5-2')
	CONC. (ug/kg)
VOCs Acetone	200.0 J

	SB4665 (6-6.5')
PARAMETER	CONC. (ug/kg)
VOCs XYLENE(TOTAL)	1900

	SB346 (4-6')
PARAMETER	CONC. (ug/kg)
VOCs XYLENE(TOTAL)	7800

	SS-1-4B (1.5-2')
	CONC. (ug/kg)
VOCs Trichloroethene	2600.0 J
Xylenes(total)	12000.0

	VEW175 (7.5')
PARAMETER	CONC. (ug/kg)
VOCs TRICHLOROETHENE	17000
ETHYLBENZENE	8000
XYLENE(TOTAL)	78000 E

	SS-1-5C (4.5-5')
	CONC. (ug/kg)
VOCs Xylene(total)	11000.0

	SB168 (6-8')
PARAMETER	CONC. (ug/kg)
VOCs TRICHLOROETHENE	21000
TOLUENE	2900
ETHYLBENZENE	11000
XYLENE(TOTAL)	78000

	SB268 (6-8')
PARAMETER	CONC. (ug/kg)
VOCs XYLENE(TOTAL)	19000
	SB220 (6-8'dup)
PARAMETER	CONC. (ug/kg)
VOCs ETHYLBENZENE	5800
XYLENE(TOTAL)	44000

LEGEND

- FENCE
- SS – 1993 SOIL SAMPLE LOCATION
- SS – 1994 SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- 816 – GROUND SURFACE ELEVATION CONTOUR
- TREE
- AREA BOUNDARIES
- SOIL BORING
- SVE/CASVE WELL
- SOIL GAS PROBE
- (D) – INDICATES FILTERED INORGANIC RESULT
- VOLATILE ORGANIC CONCENTRATIONS EXCEED DEC TAGM SOIL CLEANUP CRITERIA

1" = 50'

25 0 50

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

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Figure 6-1

Areal Extent of VOC Soil Contamination Exceeding Criteria

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

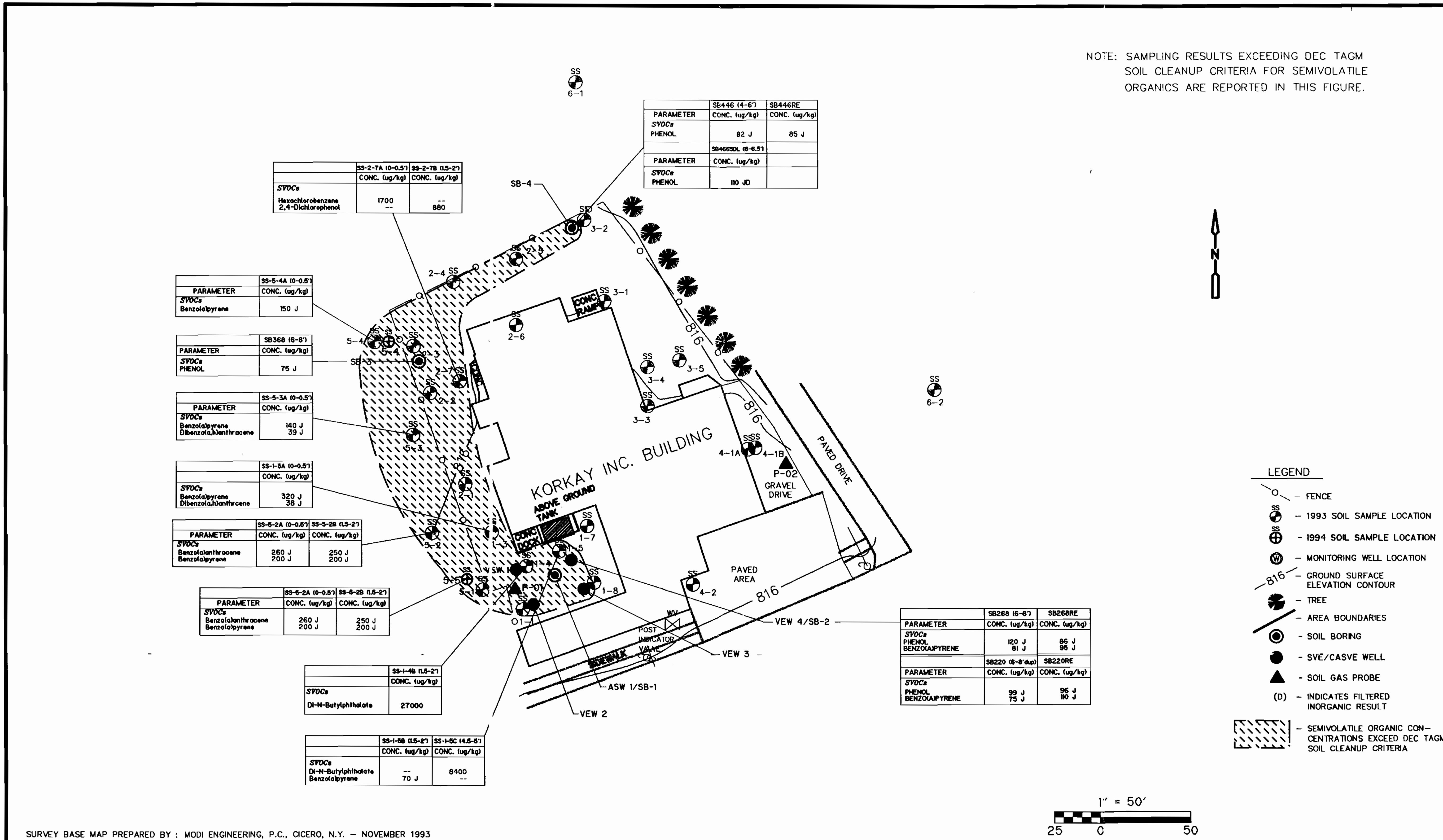

Figure 6-2

Areal Extent of SVOC Soil Contamination Exceeding Criteria

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

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NOTE: SAMPLING RESULTS EXCEEDING DEC TAGM SOIL CLEANUP CRITERIA FOR PESTICIDES ARE REPORTED IN THIS FIGURE.

	SS-2-7A (0-0.5')	SS-2-7B (1.5-2')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
Heptachlorepoxide	--	37.00 EJ
Gamma-Chlordane	1800.00 DJ	1600.00 DJ

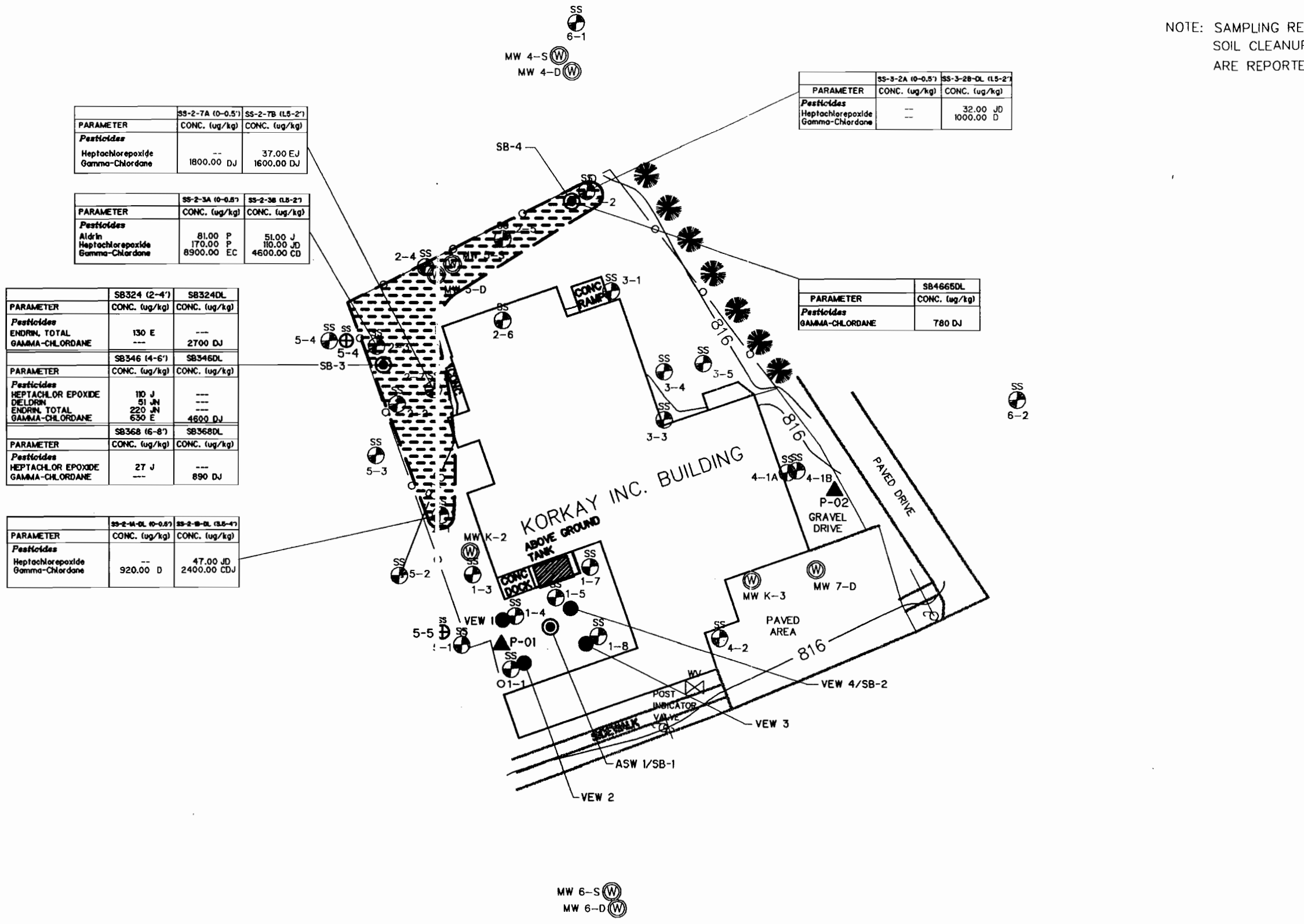
	SS-2-3A (0-0.5')	SS-2-3B (1.5-2')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
Aldrin	81.00 P	51.00 J
Heptachlorepoxide	170.00 P	110.00 JD
Gamma-Chlordane	8900.00 EC	4600.00 CD

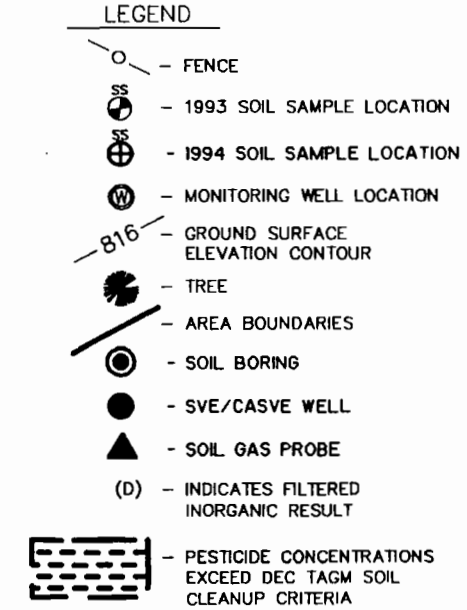
	SB324 (2-4')	SB324DL
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
ENDRIN, TOTAL	130 E	---
GAMMA-CHLORDANE	---	2700 DJ
	SB346 (4-6')	**SB346DL**
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
HEPTACHLOR EPOXIDE	110 J	---
DIELDRIN	51 JN	---
ENDRIN, TOTAL	220 JN	---
GAMMA-CHLORDANE	650 E	4600 DJ
	SB368 (6-8')	**SB368DL**
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
HEPTACHLOR EPOXIDE	27 J	---
GAMMA-CHLORDANE	---	890 DJ

	SS-2-14-DL (0-0.5')	SS-2-19-DL (1.5-2')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
Heptachlorepoxide	--	47.00 JD
Gamma-Chlordane	920.00 D	2400.00 CDJ

	SS-3-2A (0-0.5')	SS-3-2B-DL (1.5-2')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
Heptachlorepoxide	--	32.00 JD
Gamma-Chlordane	--	1000.00 D

	SB4665DL
PARAMETER	CONC. (ug/kg)
Pesticides	
GAMMA-CHLORDANE	780 DJ





1" = 50'

25 0 50

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 6-3

Areal Extent of Pesticide Soil Contamination Exceeding Criteria

Korkay Inc. Site – Broadalbin, New York

NYSDEC Site #5-18-014

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NOTE: SAMPLING RESULTS EXCEEDING DEC TAGM SOIL CLEANUP CRITERIA ARE REPORTED IN THIS FIGURE.

	SB324 (2-4')	SB324DL
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
ENDRIN, TOTAL	130 E	---
GAMMA-CHLORDANE	---	2700 DJ
	SB346 (4-6')	SB346DL
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
XYLENE(TOTAL)	7800	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
HEPTACHLOR EPOXIDE	110 J	---
DIELDRIN	51 JN	---
ENDRIN, TOTAL	220 JN	---
GAMMA-CHLORDANE	630 E	4600 DJ
	SB368 (6-8')	SB368DL
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
PHENOL	75 J	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
HEPTACHLOR EPOXIDE	27 J	---
GAMMA-CHLORDANE		890 DJ

	SS-2-6A (0-0.5')	SS-2-6B (1.5-2')
	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
Acetone	--	200.0 J

	SS-2-7A (0-0.5')	SS-2-7B (1.5-2')
	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
Hexachlorobenzene	1700	--
2,4-Dichlorophenol	--	880
	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides/PCBs		
Heptachlorepoxide	--	37.00 EJ
Gamma-Chlordane	1800.00 DJ	1600.00 DJ

	SS-2-3A (0-0.5')	SS-2-3B (1.5-2')
	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
Aldrin	81.00 P	51.00 J
Heptachlorepoxide	170.00 P	110.00 JD
Gamma-Chlordane	8900.00 EC	4600.00 CD

	SS-3-2A (0-0.5')	SS-3-2B-DL (1.5-2')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
Heptachlorepoxide	--	32.00 JD
Gamma-Chlordane	--	1000.00 D

	SB446 (4-6')	SB446RE
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
PHENOL	82 J	85 J
	SB4665 (6-6.5')	SB4665DL
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
XYLENE(TOTAL)	1900	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
PHENOL	---	110 JD
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
GAMMA-CHLORDANE	---	780 DJ

	SS-5-4A (0-0.5')	SS-5-4B (1.5-2')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
Benzo(a)pyrene	150 J	--

	SS-5-3A (0-0.5')	SS-5-3B (1.5-2')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
Benzo(a)pyrene	140 J	--
Dibenzo(a,h)anthracene	39 J	--

	SB-2-1A-DL (0-0.5')	SB-2-1B-DL (3.5-4')
	CONC. (ug/kg)	CONC. (ug/kg)
Pesticides		
Heptachlorepoxide	--	47.00 JD
Gamma-Chlordane	920.00 D	2400.00 CDJ

	SS-5-2A (0-0.5')	SS-5-2B (1.5-2')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
Benzo(a)anthracene	260 J	250 J
Benzo(a)pyrene	200 J	200 J

	SS-1-3A (0-0.5')	SS-1-3B (1.5-2')
	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs-Detected		
Benzo(a)pyrene	320 J	--
Dibenzo(a,h)anthracene	38 J	--

	VEW175 (7.5')
PARAMETER	CONC. (ug/kg)
VOCs	
TRICHLOROETHENE	17000
ETHYLBENZENE	11000
XYLENE(TOTAL)	78000 E

	SS-1-4A (0-0.5')	SS-1-4B (1.5-2')
	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
Trichloroethene	--	2600.0 J
Xylenes(total)	--	12000.0
SVOCs		
DI-N-Butylphthalate	--	27000

	SS-1-5A (0-0.5')	SS-1-5B (1.5-2')	SS-1-5C (4.5-6')
	CONC. (ug/kg)	CONC. (ug/kg)	CONC. (ug/kg)
VOCs			
Xylene(total)	--	--	11000.0
SVOCs			
DI-N-Butylphthalate	--	--	8400
Benzo(a)pyrene	--	70 J	--

	SB268 (6-8')	SB268RE
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
XYLENE(TOTAL)	19000	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
PHENOL	120 J	86 J
BENZO(A)PYRENE	81 J	96 J
	SB220 (6-8'dup)	SB220RE
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
ETHYLBENZENE	5800	---
XYLENE(TOTAL)	44000	---
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
SVOCs		
PHENOL	99 J	96 J
BENZO(A)PYRENE	75 J	110 J

	SB168 (6-8')	SB112 (12-14')
PARAMETER	CONC. (ug/kg)	CONC. (ug/kg)
VOCs		
TRICHLOROETHENE	21000	---
TOLUENE	2900	---
ETHYLBENZENE	11000	---
XYLENE(TOTAL)	78000	---

KORKAY INC. BUILDING
ABOVE GROUND TANK
CONC. DOCK
CONC RAMP
PAVED AREA
PAVED DRIVE
GRAVEL DRIVE
POST INDICATOR VALVE
SUMP
SB-4
MW 4-S
MW 4-D
MW K-2
MW K-3
MW 7-D
MW 6-S
MW 6-D
VEW 4/SB-2
VEW 3
VEW 2
ASW 1/SB-1
816

LEGEND

- FENCE
- SS – 1993 SOIL SAMPLE LOCATION
- SS – 1994 SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- 816 – GROUND SURFACE ELEVATION CONTOUR
- TREE
- AREA BOUNDARIES
- SOIL BORING
- SVE/CASVE WELL
- SOIL GAS PROBE
- (D) – INDICATES FILTERED INORGANIC RESULT
- SEMIVOLATILE ORGANIC CONCENTRATIONS EXCEED DEC TAGM SOIL CLEANUP CRITERIA
- VOLATILE ORGANIC CONCENTRATIONS EXCEED DEC TAGM SOIL CLEANUP CRITERIA
- PESTICIDE CONCENTRATIONS EXCEED DEC TAGM SOIL CLEANUP CRITERIA

1" = 50'
25 0 50

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 6-4

Areal Extent of Organic Soil Contamination Exceeding Criteria

Korkay Inc. Site – Broadalbin, New York

NYSDEC Site #5-18-014

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east. A fourth deep well, MW-7D, while screened stratigraphically deeper, also supports this finding. However, because of the heterogeneity, the easterly flow in the deep zone is considered an approximation.

As suspected from the earlier investigations, the organic constituents found in the soil have migrated into the uppermost water bearing zone. The groundwater data from samples collected in the uppermost water bearing zone indicate concentrations of organic and metals constituents in excess of DEC and NYSDOH standards. The data suggest that the site is the source of many of the organic contaminants detected and that they are migrating off site with the shallow water toward Kennyetto Creek located to the south of the site. The southern horizontal extent of the plume in the uppermost water bearing unit has been determined during the Phase II RI work.

The shallow water unit discharges at the seep location. Based on the surrounding land uses downgradient of the site, including residences with septic systems and other industrial land uses, Korkay may not be the sole contributor to the off site contamination detected.

The relatively impermeable nature of the aquitard encountered at the site effectively retards downward movement of organic contaminants. During initial phase RI sampling, organic concentrations exceeding NYS SCGs were not found in any of the deep well samples. During Phase II RI sampling, concentrations of xylene were detected above the DEC and NYSDOH water criteria of 5 ppb in one deep well and di-n-butylphthalate was detected slightly above the criteria of 50 ppb in two deep wells. The organic compounds detected above criteria are similar to those found on the Korkay site, but could also be attributable to other outside sources. For example, of the nine wells at the site, these two wells are both flush mount wells and are located just off West Main Street. Flush mount wells can be more susceptible to outside sources of contamination than stick-up wells. Furthermore, di-n-butylphthalate is a ubiquitous pollutant due to its widespread use primarily as a plasticizer, and is known to be a common laboratory contaminant. In the well samples, di-n-butylphthalate was also found in the two water method blanks at low levels. The di-n-butylphthalate levels found in the deep well samples slightly exceed the DEC and NYSDOH criteria.

The two on site deep wells, MW-7D and MW-5D, were resampled by the DEC personnel on April 14, 1995. Samples for VOC analysis were collected. DEC's results indicate that no VOC compounds were detected in either sample collected. Therefore, it is concluded that the organic contamination above DEC and NYSDOH standards which were detected in the deeper water bearing zone (beneath the aquitard) during Phase II sampling may have been due to other factors such as cross-contamination during sample collection or sample analysis.

The approximate extent of TCL organic contamination in the shallow water bearing zone exceeding criteria, including the VOC, SVOC, pesticide fractions, is shown on Figure 6-5. The approximate extent of TCL organic contamination in the shallow water bearing zone exceeding criteria off site towards Kennyetto Creek, including the VOC, SVOC, pesticide fractions, is shown on Figure 6-6. The plume boundaries shown have been approximated from sample location to sample location based on the phase II RI data collected, since organic concentrations were generally higher than initial phase data results. However, concentrations between sample

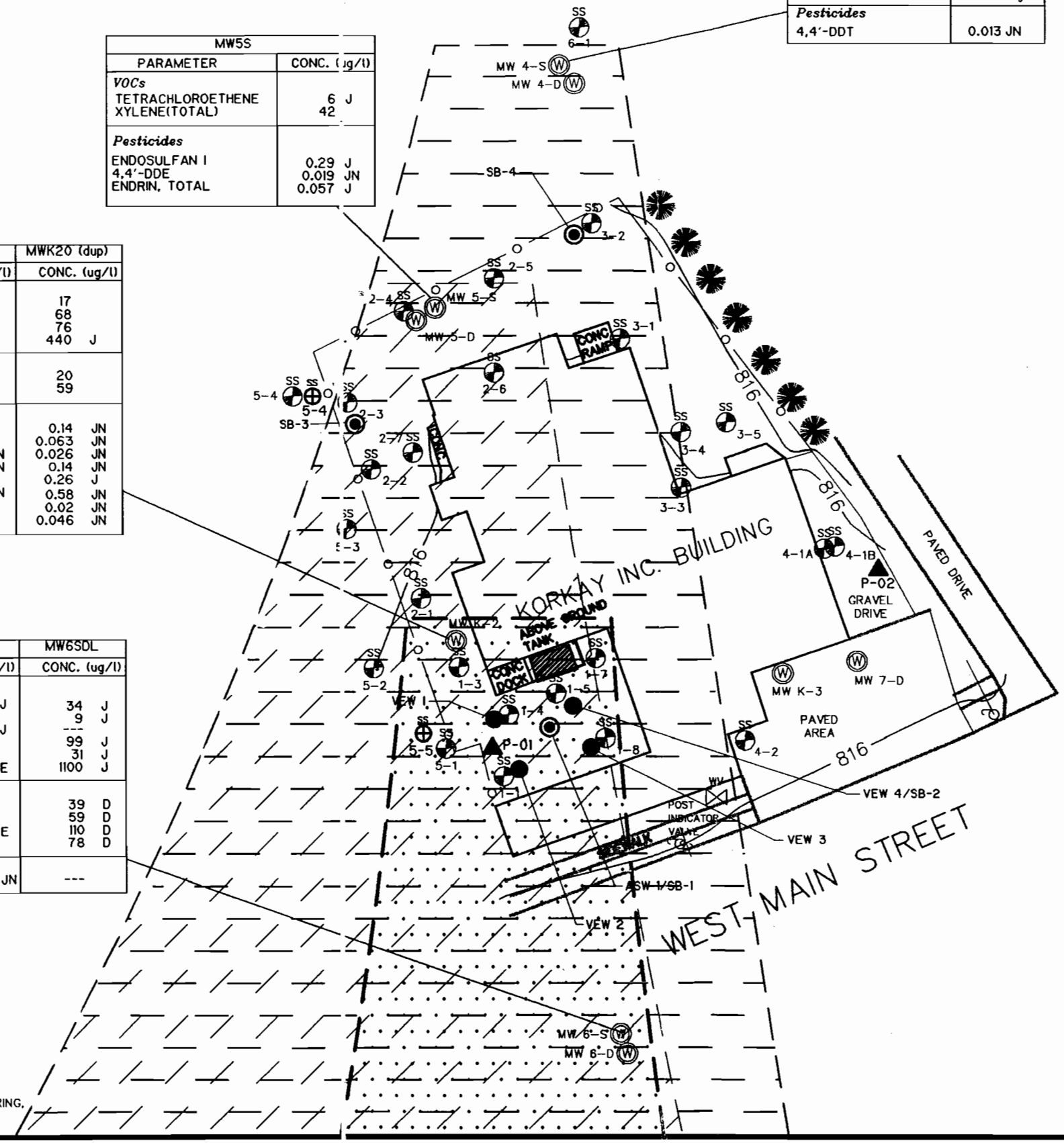
MW4S	
PARAMETER	CONC. (ug/l)
Pesticides	
4,4'-DDT	0.013 JN

MW5S	
PARAMETER	CONC. (ug/l)
VOCs	
TETRACHLOROETHENE	6 J
XYLENE(TOTAL)	42
Pesticides	
ENDOSULFAN I	0.29 J
4,4'-DDE	0.019 JN
ENDRIN, TOTAL	0.057 J

	MWK2	MWK20 (dup)
PARAMETER	CONC. (ug/l)	CONC. (ug/l)
VOCs		
1,2-DICHLOROETHENE(TOTAL)	11	17
TRICHLOROETHENE	53	68
ETHYLBENZENE	33	76
XYLENE(TOTAL)	170	440 J
SVOCs		
NAPHTHALENE	49	20
DI-N-BUTYLPHTHALATE	---	59
Pesticides		
ALDRIN	---	0.14 JN
HEPTACHLOR EPOXIDE	0.084	0.063 JN
DIELDRIN	0.034 JN	0.026 JN
4,4'-DDE	0.17 JN	0.14 JN
ENDRIN, TOTAL	0.24 J	0.26 J
GAMMA-CHLORDANE	0.51 JN	0.58 JN
4,4'-DDD	---	0.02 JN
4,4'-DDT	---	0.046 JN

	MW6S	MW6SDL
PARAMETER	CONC. (ug/l)	CONC. (ug/l)
VOCs		
1,2-DICHLOROETHENE(TOTAL)	40 J	34 J
TRICHLOROETHENE	12	9 J
BENZENE	2 J	---
TOLUENE	110	99 J
ETHYLBENZENE	80	31 J
XYLENE(TOTAL)	880 E	1100 J
SVOCs		
1,2-DICHLOROBENZENE	32	39 D
2,4-DIMETHYLPHENOL	---	59 D
NAPHTHALENE	100 E	110 D
DI-N-BUTYLPHTHALATE	69	78 D
Pesticides		
ALDRIN	0.32 JN	---

NOTE: SAMPLING RESULTS EXCEEDING DEC GROUNDWATER AND/OR DOH DRINKING WATER VALUES ARE REPORTED IN THIS FIGURE.



LEGEND

- FENCE
- 1993 SOIL SAMPLE LOCATION
- 1994 SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- 816 – GROUND SURFACE ELEVATION CONTOUR
- TREE
- AREA BOUNDARIES
- SOIL BORING
- SVE/CASVE WELL
- SOIL GAS PROBE
- (D) – INDICATES FILTERED INORGANIC RESULT
- Volatile Organic plume
- Semivolatile Organic plume
- Pesticide/PCBs plume

1" = 50'

25 0 50

SURVEY BASE MAP PREPARED BY : MODI ENGINEERING, P.C., CICERO, N.Y. – NOVEMBER 1993

Figure 6-5

Boundary of Organic Groundwater Contaminants Exceeding Criteria
Shallow Water Bearing Zone

Korkay Inc. Site – Broadalbin, New York

NYSDEC Site #5-18-014

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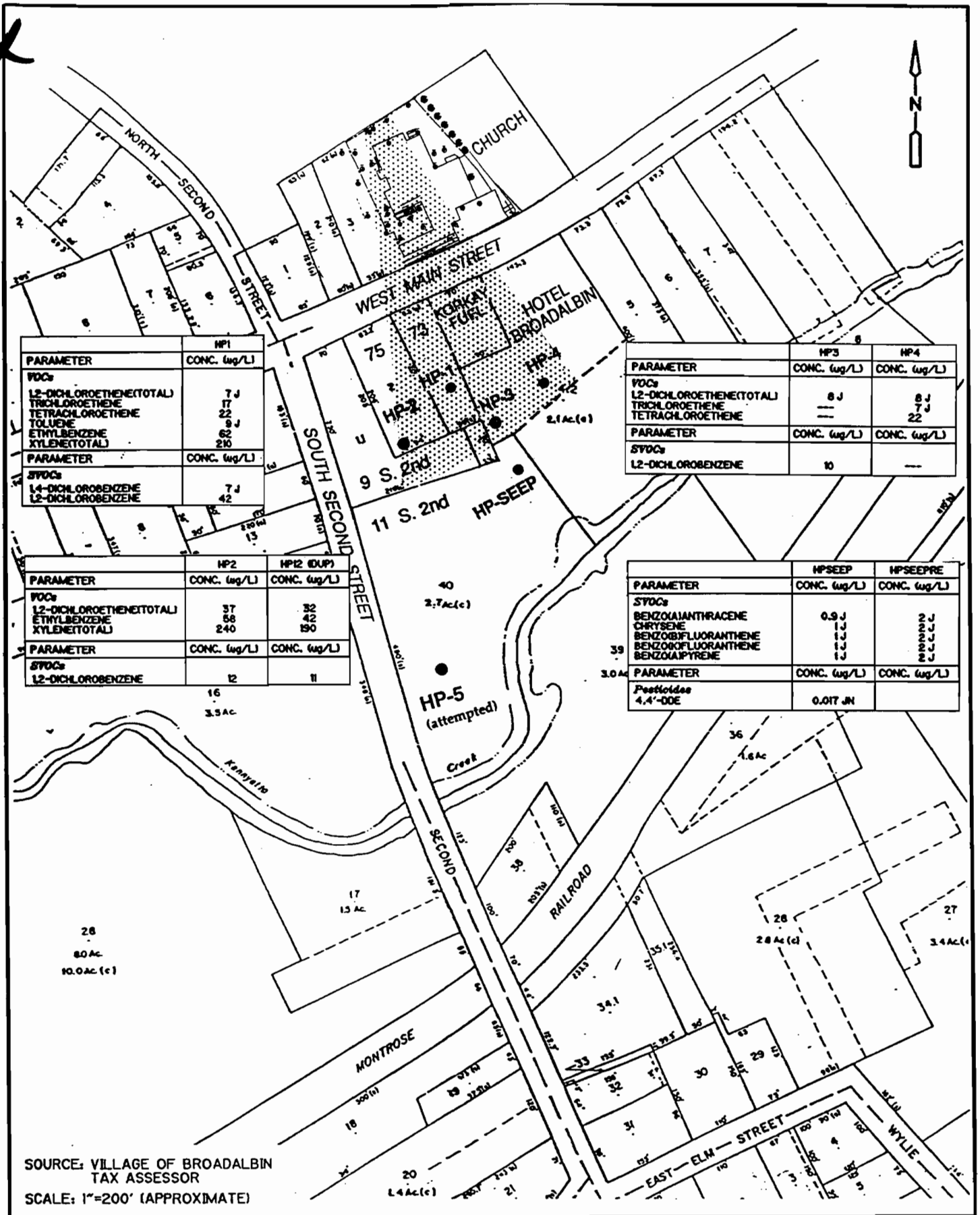

	HP1
PARAMETER	CONC. (ug/L)
VOCs	
1,2-DICHLOROETHENE(TOTAL)	7 J
TRICHLOROETHENE	17
TETRACHLOROETHENE	22
TOLUENE	9 J
ETHYLBENZENE	62
XYLENE(TOTAL)	210
PARAMETER	CONC. (ug/L)
SVOCs	
1,4-DICHLOROBENZENE	7 J
1,2-DICHLOROBENZENE	42

	HP2	HP12 (DUP)
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
VOCs		
1,2-DICHLOROETHENE(TOTAL)	37	32
ETHYLBENZENE	58	52
XYLENE(TOTAL)	240	190
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
SVOCs		
1,2-DICHLOROBENZENE	12	11

	HP3	HP4
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
VOCs		
1,2-DICHLOROETHENE(TOTAL)	8 J	8 J
TRICHLOROETHENE	---	7 J
TETRACHLOROETHENE	---	22
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
SVOCs		
1,2-DICHLOROBENZENE	10	---

	HPSEEP	HPSEEPRE
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
SVOCs		
BENZO(A)ANTHRACENE	0.9 J	2 J
CHRYSENE	1 J	2 J
BENZO(B)FLUORANTHENE	1 J	2 J
BENZO(K)FLUORANTHENE	1 J	2 J
BENZO(A)PYRENE	1 J	2 J
PARAMETER	CONC. (ug/L)	CONC. (ug/L)
Pesticides		
4,4'-DDE	0.017 JN	

Figure 6-6

Boundary of Organic Contaminants Exceeding Criteria (Including Offsite Samples) Shallow Water Bearing Zone

Korkay Inc. Site – Broadalbin, New York
NYSDEC Site #5-18-014

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locations may be more than or less than the groundwater criteria. Since there were no sampling points outside the area as shown, the lateral and upgradient boundaries are uncertain.

During Phase II RI sampling, both filtered and unfiltered water samples were collected from both shallow and deep wells to confirm the presence of dissolved versus total metals concentrations. Of the metals detected in shallow groundwater samples, only iron, manganese, sodium, thallium, and antimony exceeded standards in the filtered samples from the shallow water bearing unit. Of these, the thallium and antimony data are suspect because they were not detected in the unfiltered samples. Iron, manganese, and sodium are particularly common in groundwater. DEC has found high levels of iron in samples collected in the vicinity of the study area and local water supply wells have occasionally had elevated iron and manganese. Since there is no history of metals discharge at the Korkay site, these metals are believed to be naturally occurring in the groundwater. Iron exceeded both the DEC and NYSDOH standards in several deep well samples, both dissolved and total. Total and dissolved sodium both exceeded the DEC groundwater standard in several samples. These metals are believed to be naturally occurring. No other filtered metals samples exceeded the standards in the deep water bearing unit.

Specific chemicals of potential concern and detailed discussion about the Phase II RI nature and extent of contamination within each area of the site can be found in Section 4 of this report.

Surface Water & Sediment

Based on the surrounding land uses of the site, including residences with septic systems and other industrial land uses, it is likely that Korkay may not be the sole contributor to impacts of surface water and sediment quality.

TCE, found at the Korkay site, was also detected in a surface water sample above criteria, at a location upstream of where the seep was observed to intersect the creek. The TCE concentration found in the sediment sample is below the DEC TAGM soil criteria. The SVOC compound found in the surface water may be attributable to sample collection or sampling handling in the laboratory. Bis(2-ethylhexyl)butylphthalate is known to be a common laboratory contaminant. The SVOC compounds detected in the sediment, below the DEC TAGM soil criteria, are similar in nature to those found on site and include PAHs commonly found in diesel and fuel oils. It is suspected that other sources of SVOC contamination may exist in the area between Korkay and the creek. No pesticides were detected in the surface water, and were detected at low concentrations in sediment samples. The metals detected in the surface water and the sediment are similar in nature to those found in the area.

Soil Vapor Extraction/ Combined Air Sparging Vapor Extraction (SVE/ CASVE) Treatability Study

The SVE/CASVE treatability study was conducted in October 1994 to evaluate and determine its effectiveness in treating primarily the volatile organic contaminants found in Area 1 of the site. Based on the study conducted and the data collected, it is concluded that this treatment technology is effective to reduce contamination concentrations of the VOCs, and to a lesser degree, several of the lighter-fraction SVOCs, found in the Areas 1 soils. The VOCs found in Areas 2 and 3 in the vadose zone would also benefit from SVE. Although air sparging will not

have an affect on pesticides removal, based on available site history information, DEC believes that use of pesticides was not part of the regular Korkay operations. Furthermore, no impact of the pesticides in the groundwater on Kennyetto Creek at any significant levels was found.

Risk Assessment

In May 1994, the risk assessment findings were submitted to DEC under separate cover in a report entitled "Human Health Risk Assessment for the Korkay, Inc. Site". Since the Korkay, Inc. site is located in a mixed residential area, the possible risks associated with potential future residential use of the site were evaluated in the risk assessment. In summary, three potential exposure routes were considered for the resident: inhalation, ingestion, and dermal adsorption. The exposure media considered were the shallow and deep water bearing units, surficial soils, and subsurface soils.

The conservative rationale for selection of contaminants of concern used in the risk assessment was based on EPA risk assessment guidance. Based upon the RI data and applicable regulatory criteria, the potential chemicals of concern for ingestion were alpha chlordane, gamma chlordane, dieldrin, heptachlor epoxide, TCE, and manganese for the shallow water bearing unit; manganese for the deeper water bearing unit; alpha chlordane, gamma chlordane and arsenic for the surface soil; and alpha chlordane, gamma chlordane and arsenic for the subsurface soil. In addition, for lead in soil, although there are currently no quantitative toxicity criteria available for lead from EPA, EPA recommends a residential soil lead action level of 500 mg/kg based on the results of a standard application of the biokinetic lead uptake model. This level is exceeded in three samples collected in Areas 1 and 5 during initial phase RI work.

The highest risks are associated with the human consumption and household use of the water in the shallow aquifer; however, this is an unlikely scenario given that the Village of Broadalbin has a public water supply. Risks for ingestion, dermal contact, and inhalation of contaminants volatilized from shallow groundwater are above or within the target risk range recommended by EPA. Risks for ingestion for surface and subsurface soil are also within the EPA target risk range.

Based on DEC's request, an addendum to the Human Health Baseline Risk Assessment has been provided to DEC under separate cover. Based on the initial phase RI data collected, the objective of the addendum is to include a hypothetical scenario incorporating human health risk assessment due to vegetable consumption, if grown on the adjacent Hayes property. Due to the soil contamination found on the Hayes property, the results of the risk assessment addendum indicates that receptors who ingest vegetables grown on the Hayes property could be exposed to both carcinogenic and non-carcinogenic health risk that exceed the federally accepted range established by EPA.

6.2 Recommendations

The VOC, SVOC, and pesticide concentrations detected in the soil exceeding DEC recommended guidelines for soil cleanup warrant institutional controls or future remediation of the property, as discussed in the Phase I & II Feasibility Study, which was submitted to the DEC in February 1995.

One of the soil cleanup alternatives under consideration includes soil excavation. The approximate size of the areas in square feet was determined from the areal extent shown on Figure 6-4. The volume of organic-contaminated soil to be removed, based on assuming different excavation depths from one foot to four feet, is estimated to be:

	Approximate Size of Area (square feet)	Depth (feet)	Range of Soil Volume to be excavated (in-place cubic yards)
Areas 1, 2, 3, 5	13,100	1	600 to 700
Areas 1, 2, 3, 5	13,100	2	1,200 to 1,300
Areas 1, 2, 3, 5	13,100	3	1,800 to 1,900
Areas 1, 2, 3, 5	13,100	4	2,400 to 2,500

Based on the findings of the addendum to the Human Health Baseline Risk Assessment, risks were identified with ingestion of vegetables rooted in contaminated soil within at least 2 feet. Based on a limiting assumption of planting only consumable produce with roots of 1 foot and 2 feet or less, the volume of organic-contaminated soil to be removed in Area 5 is estimated to be:

	Approximate Size of Area (square feet)	Depth (feet)	Range of Soil Volume to be excavated (in-place cubic yards)
Hayes backyard (remaining area 55' x 170')	9,350	1	450 to 550
Hayes backyard (remaining area 55' x 170')	9,350	2	900 to 1,000

Although metals are not primary contaminants of concern, soil excavation would also beneficially reduce metals concentrations through removal. Once affected soils are excavated, the exposed area would be backfilled with clean soil to prevent exposure to the residual media. Excavation depths of affected soils will be considered further in the detailed analysis of remedial alternatives.

The effectiveness of treating, in situ, primarily the elevated volatile organic contamination found in the soil in Area 1, has been evaluated during the SVE/CASVE treatability study conducted at the site. The treatability study results indicate that the volatile organic contamination at the site is amenable to this method of treatment. Therefore, no further testing is recommended at this time.

Based on the groundwater flow directions determined, southerly for shallow water and easterly for deeper water, the two Village of Broadalbin private water supply wells proximal to the site on Cedar Lane (to the north of the site) are at little to no risk of being impacted by groundwater contamination at the Korkay site. No further investigation of the shallow water bearing zone is

recommended at this time. No further investigation of the deeper water bearing zone is recommended at this time.

The quality of the surface water and sediment in Kennyetto Creek, a Class C stream, has been determined. While there are exceedances of criteria, it is likely that the Korkay site is not the sole contributor of contamination, particularly since contamination was also found in the upstream sample. No further investigation of the creek in connection with Korkay is recommended at this time.

Regarding the building interior, aboveground/underground storage tanks, and septic tanks at the site, the DEC has performed its own inspection and removal of drums or tank wastes that were determined to contain contamination above DEC's acceptable criteria. No intrusive work has been performed inside of the building and no fuel oil tanks have been investigated because of the DEC's statutory limitation on investigating these items. To date, it is not known whether any of the contamination, particularly in the soil, has migrated underneath the structures. However, the Village of Broadalbin has recently declared the structure to be a fire and a safety hazard, which is in need of repair or demolition. Any intrusive work inside of the building cannot be performed at this time due to safety issues, and is therefore not recommended. It is also unknown whether the fuel oil tanks contain hazardous wastes or have leaked, but cannot be recommended for investigation based on DEC's limitations.

In the Phase I & II Feasibility Study prepared in February 1995, the development of general response actions, identification and screening of remediation technologies and process options, and assemblage and screening of alternatives for site remedial action resulted in the identification of the following potentially applicable remedial action alternatives for the Korkay site:

- Alternative 1: No Action.
- Alternative 2: Access Restrictions, Alternative Water Supply, Media Monitoring.
- Alternative 3: Deed Restrictions, Alternative Water Supply, Media Monitoring, Soil Excavation, Off-Site Disposal of Excavated Soils, and Soil Vegetative Cover.
- Alternative 4: Deed Restrictions, Alternative Water Supply, Media Monitoring, Soil Excavation, Off-Site Disposal of Excavated Soils, Soil Vegetative Cover, and Combined Air Sparging and Soil Vapor Extraction (CASVE).

However, the alternative water supply will not be considered in further analysis since the recent samples collected by DEC indicate that the volatile organics were not detected in the deeper water bearing zone and the potentiometric surface of this zone is easterly, and not northerly toward the Cedar Lane homes with private water supply wells located proximal to the site.

The detailed analysis of these remedial alternatives will be performed during the Phase III FS, and a final remedial action alternative recommended for the site. The Phase III FS will be submitted to the DEC under separate cover.

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Section 7
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