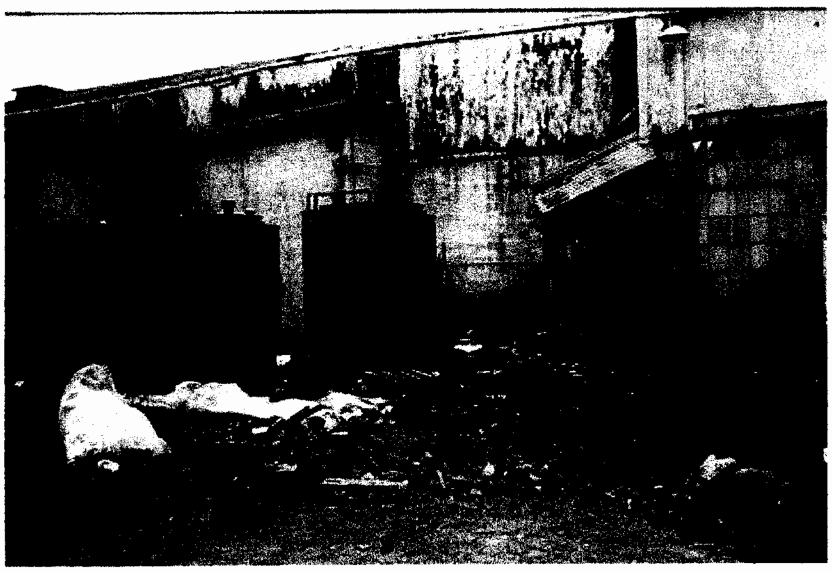
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

REMEDIAL INVESTIGATION REPORT
for the
PETER WINKELMAN CO.
Inactive Hazardous Waste Disposal Site



Site No. 7-34-047
City of Syracuse,
Onondaga County, NY

January 2000

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SECTION 1: SCOPE OF THE PROJECT

In May of 1999, the New York State Department of Environmental Remediation (DER) finalized a Work Plan for the Remedial Investigation of the Peter Winkelman site. The Remedial Investigation (RI) was planned in response to the identified presence of PCBs in the soil and groundwater which resulted in the placement of the site in the New York State Registry of Inactive Hazardous Waste Sites, as a class 2. A class 2 site is defined as a site which posses a significant threat to human health or the environment. The purpose of the RI is to characterize the nature and extent of the contamination present at the site. The following is the Remedial Investigation Report.

SECTION 2: BACKGROUND

2.1 Site Description

The Peter Winkelman Co. is located in a mixed commercial and industrial area of Syracuse, New York. The Peter Winkelman property comprises 4.9 acres located at 101-113 & 102 Greenway Avenue of which 0.05 acres are listed as a class 2 site. The property is situated approximately 600' north of the intersection of Divine Street and Erie Boulevard East and is bordered to the north by Interstate Route 690, and to the east by the Former Syracuse Rigging site. The 0.05 acre site is a former transformer area which is situated in an alcove along the east side of a large building. Currently the building is abandoned and the surrounding area has been used as a dumping area for assorted debris (i.e.,. yard waste, old tires).

2.2 Site History

2.2.1 Operating History

Peter Winkelman Co., was a construction company that owned the site until 1991 when the site was conveyed to GSI of Virginia. While the site was owned by Peter Winkelman Co, Inc. various businesses occupied buildings not used by the construction company. Due to a power outage caused by a power surge, one or more of the three transformers on Peter Winkelman's property malfunctioned. Subsequently an unknown quantity of transformer oil leaked from the transformers.

2.2.2 Remedial History

In March of 1986 the transformer oil spill was discovered by the Syracuse Fire Department. Soil sample analysis showed PCB levels as high as 199 ppm. On one or more occasions in 1986, the Peter Winkelman Company was informed by the NYSDEC of the company's legal responsibility to remediate the transformer oil spill.

In July of 1987 the NYSDEC informed Winkelman that if the site was not cleaned up by August of the same year, it would be included on the registry of Inactive Hazardous Waste Sites, and litigation would be commenced.

In June of 1994 additional sampling was conducted at the site. PCB concentrations of up to 120 ppm were detected in the soil.

In April of 1997 it was observed that the oil from the three transformers had been emptied on to the ground as a result of someone scavenging the copper from the transformers. PCB levels of over 300 ppm were detected in residual oil sampled from all three transformers.

In June of 1997 the transformers were removed by a NYSDEC Spills contractor. Collection of free product from the excavation of the concrete transformer pad and removal of contaminated soil was carried out.

In June of 1997, in response to the presence of PCBs, the transformers were removed from the site and transported for disposal. The concrete pad was broken up and removed along with the contaminated soil. No soil was removed below four feet. The excavation remained open for six days. Booms and pads were placed in the excavation during this time to absorb as much of the PCB oil present as possible. Two slotted culvert pipes were placed vertically in the excavation and surrounded with stone. Ten mil poly was placed over the stone and bentonite around the culverts. Then two feet of crusher run was placed to bring the site up to grade. In August 1997 a mobile oil skimmer was installed in the culvert that exhibited the highest level of PCB contamination . The oil skimmer makes use of the differences in specific gravity and surface tension between oil and water. These physical characteristics allow the unit's continuous belt to attract floating oil in the well. After picking up the oil, the belt travels through tandem wiper blades which scrape the oil off both sides of the belt and discharge it to a 55 gallon drum.

SECTION 3: REMEDIAL INVESTIGATION

In order to determine the nature and extent of contamination remaining at the Peter Winkelman Site, after the completion of the IRM, the DER initiated a Focused Remedial Investigation (RI) at the site in May 1999. This section summarizes the methodology and findings of the investigations undertaken as part of the focused RI. More detail relative to the investigation is available in the work plan entitled "Remedial Investigation On-site Work Plan" dated May, 1999.

As part of this investigation, the following activities took place:

- Surface and subsurface soil samples were collected using a Geoprobe rig*. The samples were then analyzed for PCBs.

- Piezometers were installed to define groundwater flow direction and determine the extent of groundwater contamination.

- Groundwater samples were collected and analyzed to help determine the extent of groundwater contamination.

3.1 Geoprobe Investigation

Historical data indicated that the PCB contamination was due to spills/leaks from transformers and therefore limited to an area of approximately 0.05 acres, which is reflected in the listing of the site on the Registry of Inactive Hazardous Waste sites. For this reason eight sampling locations were chosen around the former concrete pad area, as shown in Figure 1.

As part of the geoprobe investigation 14 subsurface soil samples were collected and analyzed. A summary of the results is provided in Table 1.

Of the 14 soil samples collected from the site 4 samples registered positive for PCBs. The highest level detected was located to the northeast of the former transformer area, SB-4, at 11 parts per million (PPM) compared to the Standards, Criteria, and Guidance (SCG) level of 10 ppm for subsurface soil. The PCB level of 11 PPM at SB-4 is considered to be a localized occurrence and not representative of a second source area. This is based on the lab analysis results from SB-3 and SB-4, the two sample locations closest to SB-4, which were non-detect for PCBs. Also groundwater at SB-4 was found to be unimpacted by PCBs. The three other samples that contained PCBs were at levels under 0.3 PPM. The remaining 10 samples were nondetect at a detection level ranging from 0.038 PPM to 0.052 PPM depending upon the sample. The sampling locations are shown in Figure 1.

The geoprobe investigation showed that soil contamination is highly localized and present at low levels, at or below SCGs. This confirmed that during the IRM the soil that was most highly contaminated with PCBs was removed.

3.2 Piezometers

Piezometers were installed at the eight locations where soil samples were taken. The purpose

*A Geoprobe rig is a small push type drilling rig used for shallow soil sampling and piezometer installation.

of the piezometers was to define groundwater flow direction around the former transformer area and to obtain groundwater samples. Piezometer locations are shown in Figure 2. A discussion of subsurface geology and hydrogeology can be found in Section 4.2, Site Geology and Hydrogeology.

Piezometers were installed using a direct push rig. Soil types were classified and recorded by a geologist. The total depth of each piezometer ranged from 7.5 to 8 feet below ground surface. Piezometers were constructed of one inch ID Schedule 40 flush-threaded PVC well screen (0.010-inch machine slotted) and riser. The sand pack was constructed with No. 1 Morie sand. A bentonite seal was placed above the sand pack, followed by a cement/bentonite grout to be placed to within three feet of the ground surface. Each piezometer has a vented cap and steel flush mounted protective casing. A cement pad was constructed to divert surface water from each piezometer.

Piezometers were developed by pumping and bailing until temperature, pH, and conductivity stabilized. Turbidity was also monitored with a target value of 50 NTUs.

3.4 Groundwater Sampling

One groundwater sample was collected from each of the eight piezometers to determine the extent of groundwater contamination at the site. Of the eight piezometers sampled only P-1 and P-6 showed signs of contamination. Located approximately eight feet to the south of the former transformer area P-1 exhibited elevated levels (70 PPB) of PCBs. P-2, which is located approximately 10 feet south of P-1, did not exhibit any PCB contamination. P-6 located approximately six feet to the southwest of the former transformer area only exhibited slightly elevated levels (0.89 PPB) of PCBs. The results of the analysis for all monitoring wells are presented in Table 2. The location of the piezometers are shown in Figure 2.

SECTION 4: GEOLOGIC AND HYDROGEOLOGIC SETTING

4.1 Regional Geology

The site is located near the border of two physiographic provinces within New York state: the Ontario Lowlands to the north and the northern margin of the Appalachian Uplands to the south (NYSMSS, 1973). The Ontario Lowlands slope down toward the north and represent the southern extension of the Lake Ontario drainage basin while the northern margin of the Appalachian Uplands includes the Finger Lake troughs. The geology of this area can be described in terms of bedrock and overburden deposits.

Bedrock in the Central New York area is dominated by nearly flat-lying Silurian and Devonian age sedimentary rocks which have a variable but gentle dip toward the south of roughly 100 feet per mile. The Onondaga Lake Valley in particular is underlain by the relatively soft Vernon

Formation, a gray, green, and red shale. The Vernon Formation is overlain by the Syracuse Formation, which consists of shales, dolostones, gypsum, and rock salt, and the Camillus Formation consisting primarily of soft, green dolomitic shales and thin gypsiferous shales. Bedrock near the site has been mapped as the Camillus Formation by Rickard and Fisher (1970).

The preglacial bedrock surface near the site was extensively modified by overriding Pleistocene glaciers. Deepening of the preglacial Onondaga Valley by glacial ice, in the same manner as the formation of the Finger Lake Valleys, produced a bedrock basin extending below sea level (Stewart, 1935). Glacial sculpting of the area has produced a pronounced north-northwest to south-southeast orientation of hills and valleys. This orientation is, in part, a result of erosion of the underlying bedrock by the ice and deposition of till into streamlined elliptical hills. These hills are known as drumlins and are composed predominantly of till. Till is typically a compact, unsorted, poorly stratified mixture of sands, silt, clay, gravel, and boulders deposited directly by glacial ice. Till generally overlies bedrock in this area as a thin veneer 10 to 15 feet thick. In some locations, commonly in drumlins, it is much thicker and in other areas within valleys and on the uplands, the till is absent.

During glacial retreat in the Onondaga Valley, preglacial drainage to the north was blocked by the ice front, producing a proglacial lake in which large volumes of glaciolacustrine sediments were deposited. Drainage in adjacent north-south trending valleys, both east and west of the Onondaga valley, were also blocked, producing a series of lakes standing against the ice. As the level of these lakes rose, they utilized the lowest available drainage pathway which at times was to the south, over relatively high spillways, or to the east or west over inter-valley divides. The large volumes of melt-water spilling from one basin to another cut numerous, deep east-west trending channels into the valley divides (Fairchild, 1909). With progressive decay of the ice sheet, lower spillways opened resulting in drainage of the proglacial lakes and the eventual establishment of the modern-day system of lakes and surface drainage.

During the time that the proglacial lakes existed, they accumulated large volumes of sediment washed out from the ice and from the channels crossing valley divides. These sediments consist primarily of fine sand and silt; however, gravel, coarse to medium sand, and clay are also present at some locations. Surficial soil deposits near the site have been mapped as lacustrine silt and clay (Muller and Cadwell, 1986) likely deposited as a result of the proglacial lakes.

4.2 Regional Hydrogeology

<u>Surface Water</u>

The site is situated within the Onondaga Lake drainage basin, which covers an area of approximately 233 square miles. The Onondaga Lake basin is included within the larger Eastern Oswego River basin (2,500 square miles). Surface water drains north from the Onondaga Lake Basin to the Seneca River, then to the Oswego River, and ultimately to Lake Ontario. The surface water regime in the area of investigation is potentially influenced by Onondaga lake and its tributaries. The nearest tributary of interest consists of Onondaga Creek, flowing northward into the lake through the Onondaga Valley.

Onondaga Creek, which flows from south to north through the Onondaga Valley and the City of Syracuse, drains a watershed of approximately 102.5 square miles and has an average annual flow rate of 193.6 cfs before it discharges to the south end of Onondaga Lake at the Barge Canal terminal area. The creek has been relocated from its former discharge point which was located at the southeast corner of Onondaga Lake.

Ground Water

The geology of the Onondaga Valley greatly impacts the movement of groundwater in the valley and its tributaries. Man has altered the pre-development ground-water flow patterns and water quality by construction projects, disposal of wastes, and ground-water pumping.

Ground-water flow in Onondaga Valley and its tributaries is largely driven by topography. Water moves off the inter-valley divides and into the surface water and ground-water systems within each tributary valley. From here, it moves down-valley towards the lake. The type of flow patterns, flow velocities, and the proportion of groundwater versus surface water in each tributary valley are dependent on the local geologic conditions within that valley.

The site does not appear to directly overlie confined or unconfined unconsolidated aquifers mapped by Miller (1987); however, the site appears to be located within approximately 1 mile of a confined aquifer reported by Miller (1987). The confined aquifer within approximately 1 mile of the site likely consists of a buried sand and gravel aquifer, probably associated with glacial meltwater drainage deposits (glaciofluvial), that is overlain by relatively impermeable till deposits. Furthermore, the site does not appear to be located near any Primary or Principal water supply aquifers as classified by the New York State Department of Environmental Conservation (1987).

4.3 Site Geology

Geologic units encountered in the limited Geoprobe™ borings consist of a mix of fill material overlying and bog deposits of organic rich silt, peat, and marl. Fill material encountered in the study area is generally 4 to 6 feet thick comprised of silty gravel, fly ash and coal, white paste material, foundry sands, and crushed stone. One to three feet of organic rich silt was encountered immediately beneath the fill, underlain with peat and marl (a mix of freshwater lime mud and shells) at approximately 7 to 8 feet below grade. No samples were collected beyond 8 feet below grade due to hole cave-in within the peat and marl. Due to the high carbon content of the peat layer it is expected to limit any downward migration of contaminants.

4.4 Site Hydrogeology

Groundwater occurs under perched conditions as discontinuous lenses within the more permeable fill material, and under unconfined conditions within the peat and marl unit. Saturated sections of the fill material generally consisted of fly ash and silty gravel, often containing oily material. During development and sampling of the well points, recharge was observed to be slow, largely dependent on the composition of the fill at a specific location.

Well points were not surveyed, therefore the surface of the water table could not be accurately defined, however measurements indicate the water table to be relatively flat. It is expected that groundwater moves vertically through the fill material into the peat and marl unit, where it then flows under the effects of regional drainage patterns.

SECTION 5: EXPOSURE PATHWAY ANALYSIS

5.1 Applicable Standards, Criteria, and Guidance (SCGs)

In order to identify potential exposure pathways, applicable SCG's must be identified. 6 NYCRR Part 375-1.10(c)(1)(I) requires that remedial actions comply with SCG's "unless good cause exists why conformity should be dispensed with." Standards and Criteria are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance. Guidance includes non-promulgated criteria and guidelines that are not legal requirements; however, the site's remedial program should be designed with consideration given to guidance that, based on professional judgement, is determined to be applicable to the site.

SCG's are categorized as chemical specific, location specific, or action specific. These categories are defined as the following:

Chemical Specific: These are health or risk based numerical values or methodologies which, when applied to site specific conditions, result in the establishment of numerical values for the chemicals of interest. These values establish the acceptable amount or concentration of a chemical that may be found in or discharged to the environment.

Location Specific: These are restrictions placed on the concentrations of hazardous substances or the conduct of activities solely because they occur in a specific location.

Action Specific: These are usually technology or activity based requirements or limitations on actions taken with respect to hazardous waste management and site cleanup.

The following SCG's have been found to be applicable to the Peter Winkelman site:

Soil - NYSDEC Division of Hazardous Waste Remediation Technical and Administrative Guidance Memorandum (TAGM) 4046, Determination of Soil Cleanup and Cleanup Levels
- 6 NYCRR Part 371, Identification and listing of Hazardous Wastes
- NYSDEC Division of Hazardous Substances Regulation TAGM 3028, "Contained in Criteria for Environmental Media." (11/92)

Waste - 6 NYCRR Part 371, Listing of Hazardous Waste
- NYSDEC Division of Hazardous Substances Regulation TAGM 3028, "Contained in Criteria for Environmental Media" (11/92)

Groundwater - 6 NYCRR Part 700-705, Water Quality Regulations for Surface Water and Groundwater
- NYSDEC Division of Water TOGS 1.1.1

The analytical data summary tables present SCGs for the contaminants analyzed for in each media (i.e. soil, sediments, water, etc.)

5.2 Contaminants of Concern

By comparing data collected from the Peter Winkelman Site to SCGs, the RI established that contaminants of concern for subsurface soils are PCBs (Aroclor-1260). The development of site specific remedial objectives or "cleanup-goals" for impacted media (soil, sediment, groundwater) will be conducted as part of the Feasibility Study. Remedial objectives will take into consideration SCGs and involves consultation with the NYSDOH to insure the remedial objectives are protective of Public Health. The NYSDOH considers such factors as the toxicological properties of the contaminants of concern. Existing or potential exposure pathways, and; the present or projected site use. The NYSDEC's Division of Fish and Wildlife is also consulted to insure the remedial objectives are protective of the environment; specifically existing wildlife, their habitats, and other natural resources.

To aid in this evaluation, the following section will examine existing and potential exposures to human health and the environment.

5.3 Human Health Evaluation

5.3.1 Pathway Analysis

An exposure pathway is the route by which an individual comes in contact with a contaminant. The five elements of an exposure pathway are 1) a source of contamination; 2) the environmental medium and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. In order for an individual to be affected by contamination at the Peter Winkelman Site, for example, a pathway must be complete. Pathways may be direct or indirect. Direct exposure pathways include dermal contact with, inhalation or ingestion of the contaminant. Ingestion of contaminated drinking water is an example of a complete direct exposure pathway. An example of an indirect exposure pathway is human consumption of fish which have been contaminated by eating smaller creatures living in contaminated sediments. The following sections address several potential exposure pathways at the Peter Winkelman Site.

5.3.2 Groundwater Exposure Pathway

Groundwater samples indicate localized groundwater contamination at the site. Groundwater elevation indicate a flow direction to the south. There are no known existing wells within four miles of the site boundaries.

5.3.3 Surface Soil Exposure Pathway

Surface soils on the Peter Winkelman site do not exhibit PCB contamination. The surface soil that was contaminated by the PCB oil was removed during the IRM. There is little to no chance of human exposure to PCB contaminated soil since it is located approximately four feet below ground surface. Also, short term exposures to levels of contaminants at the site would not be expected to present a significant level of risk.

5.3.4 Air Exposure Pathway

While the gaseous and particulate mobility potential for PCBs is medium to high, air exposure is not expected to be a completed pathway since the contamination is located approximately four feet below ground surface, and is limited to a small area.

5.3.5 Conclusions

Potential human exposure pathways at the Peter Winkelman site were assessed. There are no groundwater or on-site receptors. There are no sensitive environments within four miles of the site. The source area of PCB contaminated oil, and most heavily impacted soil, was removed during the IRM. Exposure pathways do not appear to be complete as possible receptor populations are not expected to come in contact with contaminated media or concentrations of contaminants which would pose a health risk.

5.4 Habitat Based Assessment

A habitat based assessment is performed during a RI when it is determined that an impact to wildlife may exist as a result of contamination from the site. Field observations were made in conjunction with environmental sampling towards determining if such an assessment was necessary for this RI.

The potential impacts or routes of exposure to wildlife that were considered include but are not limited to the following:

- ♦ Uptake of contaminants by plant life on or near the site.
- ♦ Consumption of contaminated plants by animals in the area.
- ♦ Direct contact with contaminants at the surface by animal life on or near the site.
- ♦ Impacts to surface water via groundwater discharge.

Field observations at the site did not find any waste material at the surface. Stressed vegetation on or off site was not found to exist. Analytical results combined with hydrogeologic observations indicate that any migration of contaminants is to the south. Groundwater discharge does not likely occur in the vicinity of the site based on these observations. After consideration of the above mentioned potential impacts with the conditions defined for the site, it was determined that impacts to wildlife as a result of contamination from the site was not occurring. Therefore the habitat based assessment was not carried any further.

SECTION 6: FINDINGS OF THE REMEDIAL INVESTIGATION

6.1 Nature and Extent of Contamination

The RI identified limited PCB contamination in groundwater and subsurface soil. The highest levels detected in subsurface soil was 11 ppm, at SB-4. All other detected levels were well below the 10 PPM SCG. Piezometer-1 and piezometer-6 exhibited PCB contamination at 70 ppb and 0.89 ppb respectively. However, groundwater contamination appears to be localized and is not impacting offsite groundwater.

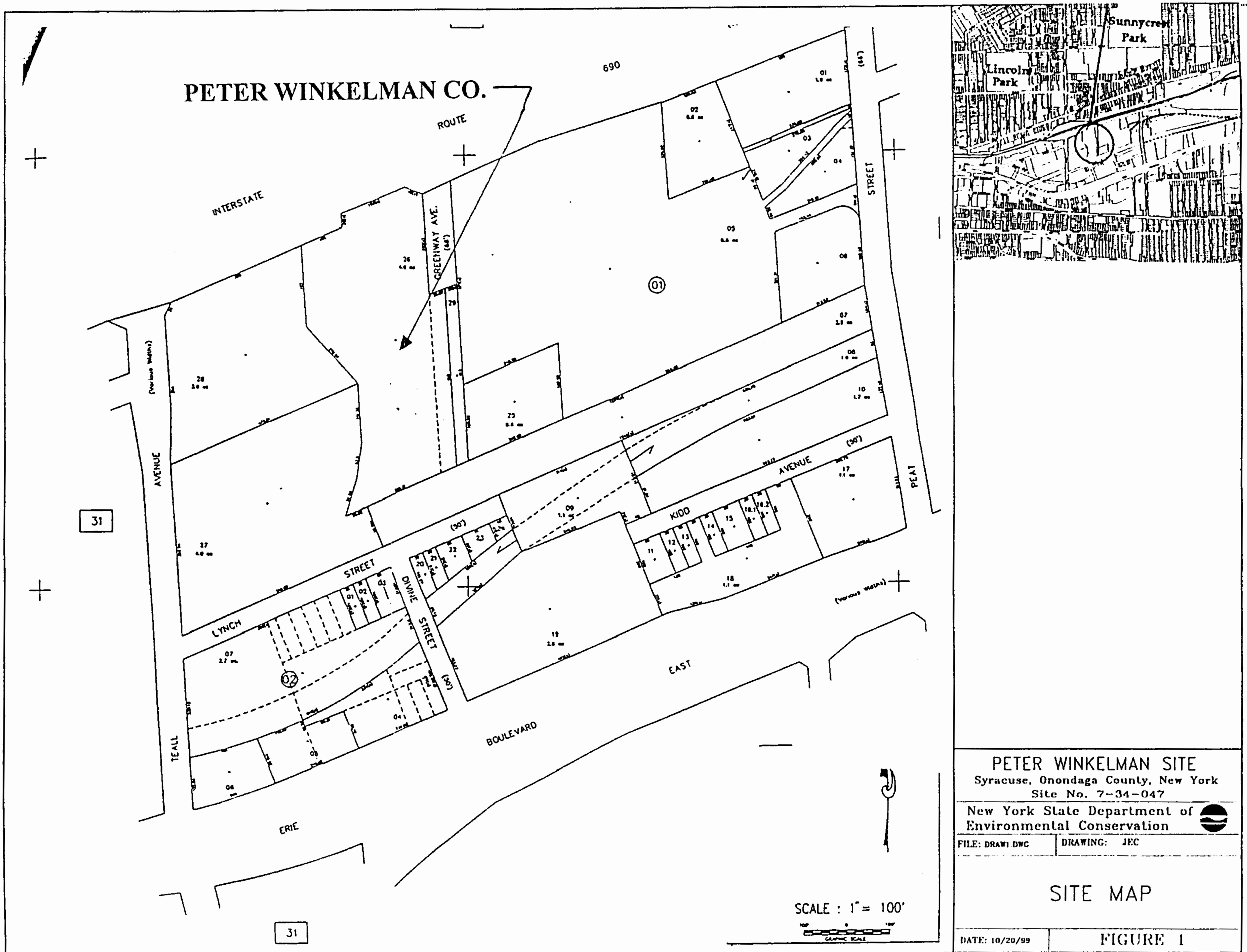
6.2 Recommendations and Conclusions

6.2.1 Recommendations

It is recommended that the oil skimmer continue to be operated to address the low level residual PCB contamination in the groundwater. There do not appear to be any offsite impacts from the presence of PCBs in the soil or groundwater. Periodic groundwater monitoring should be continued to make sure migration of PCB contaminated groundwater has not occurred. Soil contamination is at or below SCGs so no further action is recommended.

6.2.2 Conclusions

The data obtained in the RI indicate that the IRM removed the most heavily contaminated soil when the source of the PCB contamination was removed. The current state of the site presents little or no risk to the environment or human health, therefore continued operation of the oil skimmer is recommended with no further action. It should also be noted that an application for a brownfield investigation of the remaining 4.85 acres of the Peter Winkelman property has been received by the NYSDEC and is currently being held pending resolution of the class 2 status of the site.



PETER WINKELMAN SITE
Syracuse, Onondaga County, New York
Site No. 7-34-047

New York State Department of Environmental Conservation

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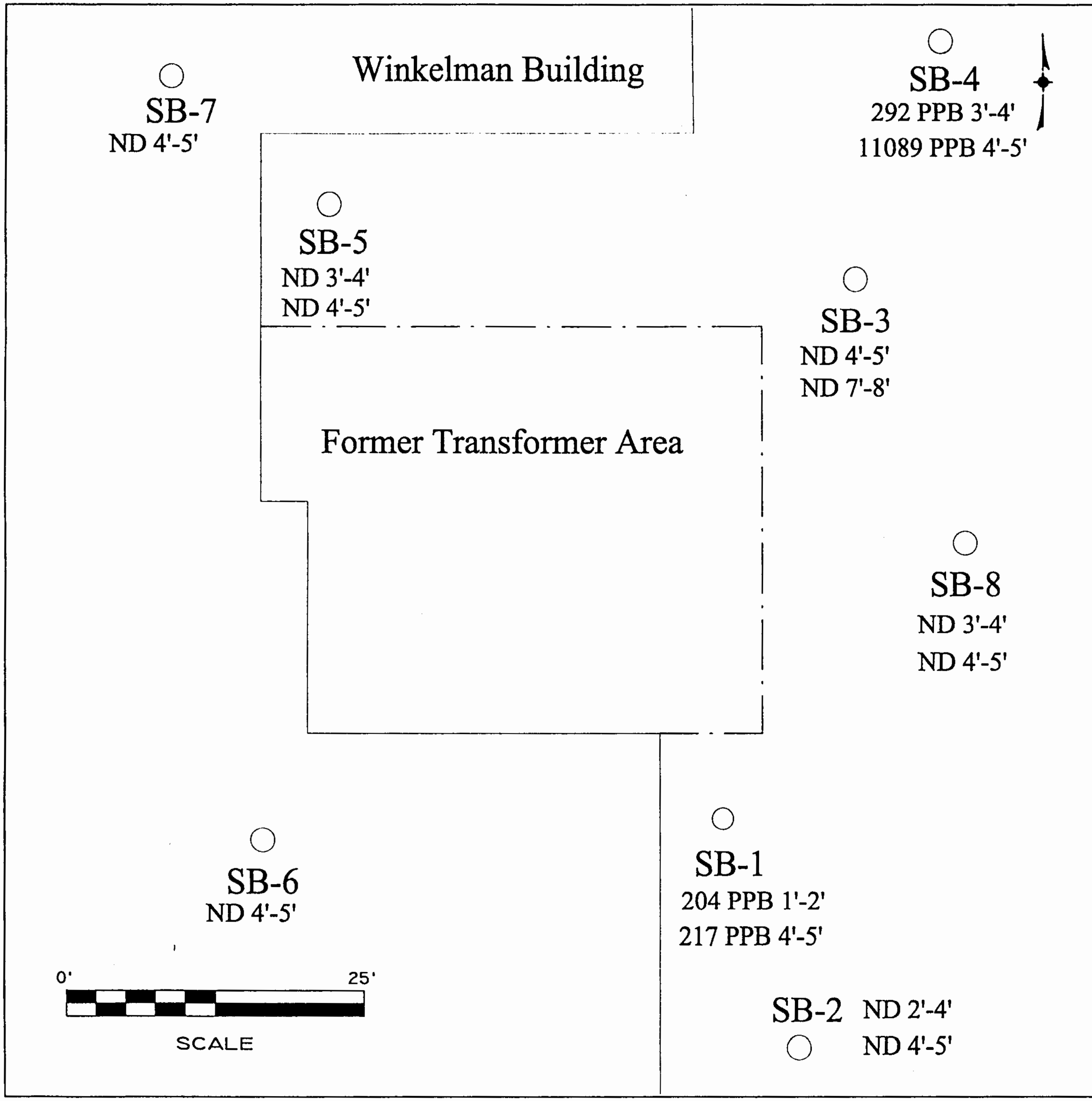
SITE MAP

DATE: 10/20/99

FIGURE 1



Fence

Soil Boring Location

SB-1

ALL LOCATIONS APPROXIMATE

PETER WINKELMAN SITE
Syracuse, Onondaga County, New York
Site No. 7-34-047

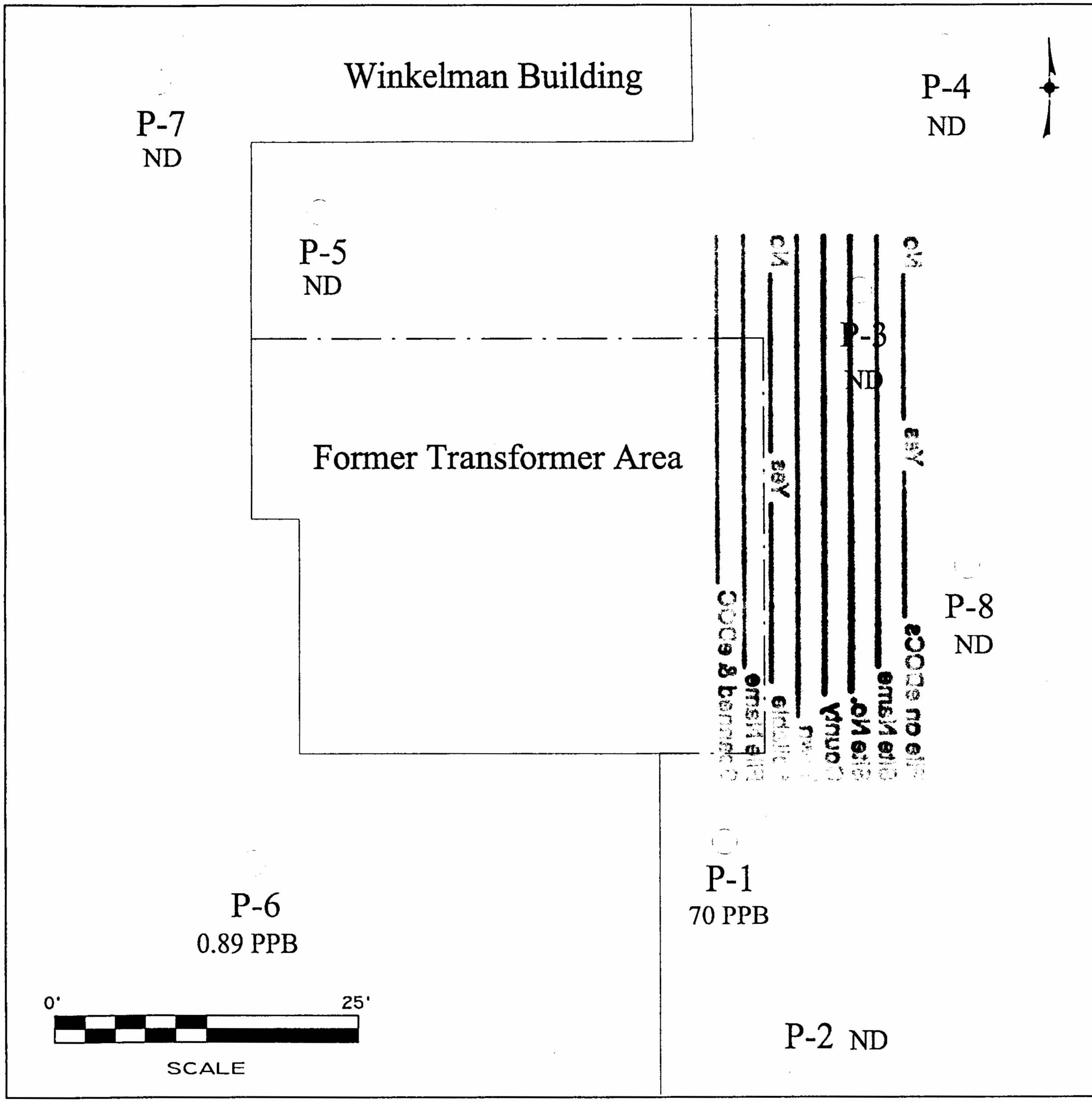
New York State Department of Environmental Conservation

FILE: DRAW1.DWG | DRAWING: JEC

SOIL BORING LOCATIONS

DATE: 10/20/99

FIGURE 2



Fence

Piezometer Location

P-1

ALL LOCATIONS APPROXIMATE

PETER WINKELMAN SITE
Syracuse, Onondaga County, New York
Site No. 7-34-047

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FILE: DRAW1.DWG | DRAWING: JEC

PIEZOMETER LOCATIONS

DATE: 10/20/99 | FIGURE 3