ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES IN THE STATE OF NEW YORK

PRELIMINARY SITE ASSESSMENT VOLUME 1

Walmore Road - Johnson Property
Site Number 932101
Town of Wheatfield, Niagara County

October 1994

Prepared for:

New York State Department of Environmental Conservation

50 Wolf Road, Albany, New York 12233
Langdon Marsh, Commissioner

Division of Hazardous Waste Remediation
Michael J. O'Toole, Jr., P.E., Director

Prepared by:

Ecology and Environment Engineering, P.C.

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EXECUTIVE SUMMARY

Under the New York State Department of Environmental Conservation (NYSDEC) Superfund Standby Contract, Ecology and Environment Engineering, P.C. (E & E) conducted a Preliminary Site Assessment (PSA) at the Walmore Road-Johnson Property site (site number 932101).

The Walmore Road-Johnson Property site is located at 6373 Walmore Road in the Town of Wheatfield, Niagara County, New York. The 2.3-acre site is privately owned residential land, which was converted from a farm prior to 1980. Prior to or at the time of this conversion, approximately 0.8 acre of land was filled on the south side of Cayuga Creek between Walmore Road and an existing house (a former barn). In 1984, a copper water supply pipe installed through the fill had corroded. The site owner then filed a complaint with the Niagara County Department of Health.

Previous investigations conducted by E & E at the site included file searches and site inspections (E & E 1989; E & E 1991). File searches conducted as part of the PSA investigation did not result in discovery of any documentation regarding on-site hazardous waste disposal.

Fieldwork for the PSA was conducted by E & E in 1993 and 1994. At this time, subsurface soil/fill, surface soil, surface water, and sediment samples were collected for analysis. Several contaminants were detected in the surficial samples collected. However, none appeared to be site related or were detected at concentrations significantly elevated above expected background concentrations. Samples of the fill were found to contain volatile and semivolatile organic compounds and metals above expected background concentrations. However, none of the samples exhibited the characteristics of a Resource Conservation and Recovery Act (RCRA) hazardous waste.

This investigation did not document disposal of hazardous waste at the site. Therefore, it is recommended that the site be delisted from the Registry of Inactive Hazardous Waste Sites. Any further use of the site should be designed to limit possible direct contact with the fill material. As regulations change, this site may be reevaluated to consider appropriate action, if any.

1. SITE ASSESSMENT SUMMARY

1.1 INTRODUCTION

Under the New York State Department of Environmental Conservation (NYSDEC) Superfund Standby Contract, Ecology and Environment Engineering, P.C. (E & E) conducted a Preliminary Site Assessment (PSA) at the Walmore Road-Johnson Property site (site number 932101). This report summarizes PSA activities conducted to date.

1.2 PURPOSE

The purpose of the PSA is to provide NYSDEC with the information necessary to properly assess and classify the Walmore Road-Johnson Property site according to one of the following inactive hazardous waste disposal site categories pursuant to Section 27-1305 of the Environmental Conservation Law:

- Class 1: Causing or presenting an imminent danger or causing irreversible or irreparable damage to the public health or environment - immediate action required;
- Class 2: Significant threat to the public health or environment - action required;
- Class 3: Does not present a significant threat to the public health or environment - action may be deferred;
- Class 4: Site properly closed - requires continued management; or
- Class 5: Site properly closed, no evidence of present or potential adverse impact - no further action required.

If none of the above categories apply to the site, or if disposal of consequential amounts of hazardous waste is not documented, then the site may be deleted from the Registry of Inactive Hazardous Waste Disposal Sites.

1.3 SITE DESCRIPTION

The Walmore Road-Johnson Property site is located at 6373 Walmore Road in the Town of Wheatfield, Niagara County, New York. The site is a 2.3-acre parcel of privately owned residential land bordered by Walmore Road to the west, Cayuga Creek to the north, Conrail railroad tracks to the east, and residential property to the south (see Figures 1-1 and 1-2). A portion of the property was filled to create nearly uniform grade. During the PSA investigation, fill material was found to cover approximately 0.8 acre and to exist between Walmore Road and the house (a converted barn) and to extend from the southern bank of Cayuga Creek southward onto the adjacent property (6381 Walmore Road). The fill consists primarily of locally derived soil, flyash, and graphite.

The site is nearly flat with an approximate elevation of 590 feet above mean sea level (USGS 1980). Cayuga Creek is approximately 5 to 10 feet below grade and the railroad tracks are elevated approximately 15 feet above grade. The site is located in an area of mixed land use. The site is in an area zoned for agricultural-residential use and is bounded by commercial zones to the north along Lockport Road and to the south along Niagara Falls Boulevard (E & E 1991). Across from the site on the west side of Walmore Road is the Niagara Falls Air Force Base. Immediately south of the Air Force Base is the Niagara Falls International Airport.

The nearest surface water is Cayuga Creek (waters index No. 0-158-8) which borders the north and northwest sides of the site. This Class C stream (6 NYCRR 837) flows generally north to south, crosses under Walmore Road through a culvert, and is diverted west across the Niagara Falls Air Force Base and International Airport. Cayuga Creek converges with the Niagara River 3.3 miles southwest of the site. Cayuga Creek is not used for drinking, industry, or primary contact recreation (NCHD 1982).

All area residents are served by municipal drinking water supplies, except for the Tuscarora Reservation located approximately 3 miles north of the site (E & E 1991).

1.4 HAZARDOUS WASTE SITE DISCUSSION

The Walmore Road-Johnson Property site is separate and distinct from the nearby Lockport Road-Struzik Property site, which was originally misnamed the Walmore Road site. Bell Aerospace Textron was known to have disposed of waste at the Lockport Road-Struzik Property site, and may have been connected to the Walmore Road-Johnson Property site due to the initial confusion over the names associated with the two sites. However, to date, no documentation has been found connecting Bell Aerospace Textron to the Walmore Road-Johnson Property site or regarding the source of waste disposed there.

The current property owner reported to the Niagara County Department of Health (NCDOH) in 1984 that the fill consisted of graphite, hardened resins, crushed plastic battery cases, etc. (Hopkins 1984b and 1984c). It was also reported that a copper water line installed through the fill in 1979 or 1980 had corroded by 1984 (Johnson 1987).

1.5 SUMMARY OF PSA WORK

The file search conducted for the PSA Task 1 report did not result in the discovery of documentation pertaining to hazardous waste disposal or linking Bell Aerospace Textron to disposal at the site. The Task 1 report concluded that overall, no significant threat to human health or the environment appeared to exist (E & E 1991). However, this report recommended additional investigation since no analytical or hazardous waste characteristic data existed for the fill. Therefore, further PSA investigation activities were conducted including a geophysical survey to delineate the fill area, and analysis of subsurface soil/fill, surface soil, surface water, and sediment samples.

Analytical results indicated that the subsurface soil/fill contained low concentrations of volatile organic compounds (VOCs) and Aroclor-1260, a polychlorinated biphenyl (PCB). The fill also contained moderate-to-high concentrations of semivolatile organic compounds including polynuclear aromatic hydrocarbons (PAHs) and other combustion products (dibenzofuran and carbazole). Low-to-moderate concentrations of pesticides were also detected. No metals exceeded the observed range of background concentrations (Shacklette and Boerngen 1984); however, mercury was present at a concentration near the high end of the observed range of background levels in one fill sample. None of the subsurface soil/fill samples exhibited any Resource Conservation and Recovery Act (RCRA) hazardous waste characteristics (6 NYCRR 371.3).

The surface soil samples collected outside the fill area contained relatively low concentrations of PAHs and pesticides indicating that their presence there and in the sediment samples is widespread. Surface water and sediment samples were analyzed for organic and inorganic analytes, but none were detected in downstream samples at concentrations significantly greater than the concentrations detected upstream.

The available historical and analytical data does not document the disposal of hazardous waste at this site. In addition, it does not appear that the site poses a significant threat to human health or the environment. A possible future threat is direct contact with the fill should excavation in the fill area be performed. The impact posed by the site on groundwater quality cannot be fully assessed due to the lack of groundwater analytical data. However, based on the low permeability of the underlying native soil and the negative EP toxicity results for the fill samples, the threat posed to groundwater quality is expected to be minimal.

Based on this information, it is recommended that the Walmore Road-Johnson Property site be deleted from the Registry of Inactive Hazardous Waste Disposal Sites. The site should be referred to the New York State and Niagara County departments of Health to monitor the future status of the site in order to provide proper notification of future owners/residents and to enforce restrictions on the movement of fill within and off the site.

1.6 NYSDEC CLASSIFICATION FORMS

The NYSDEC Registry Site Classification Decision Form and Classification Worksheet are presented on pages 1-7 and 1-8. These forms provide information necessary to properly classify the site in accordance with 6 NYCRR 375.

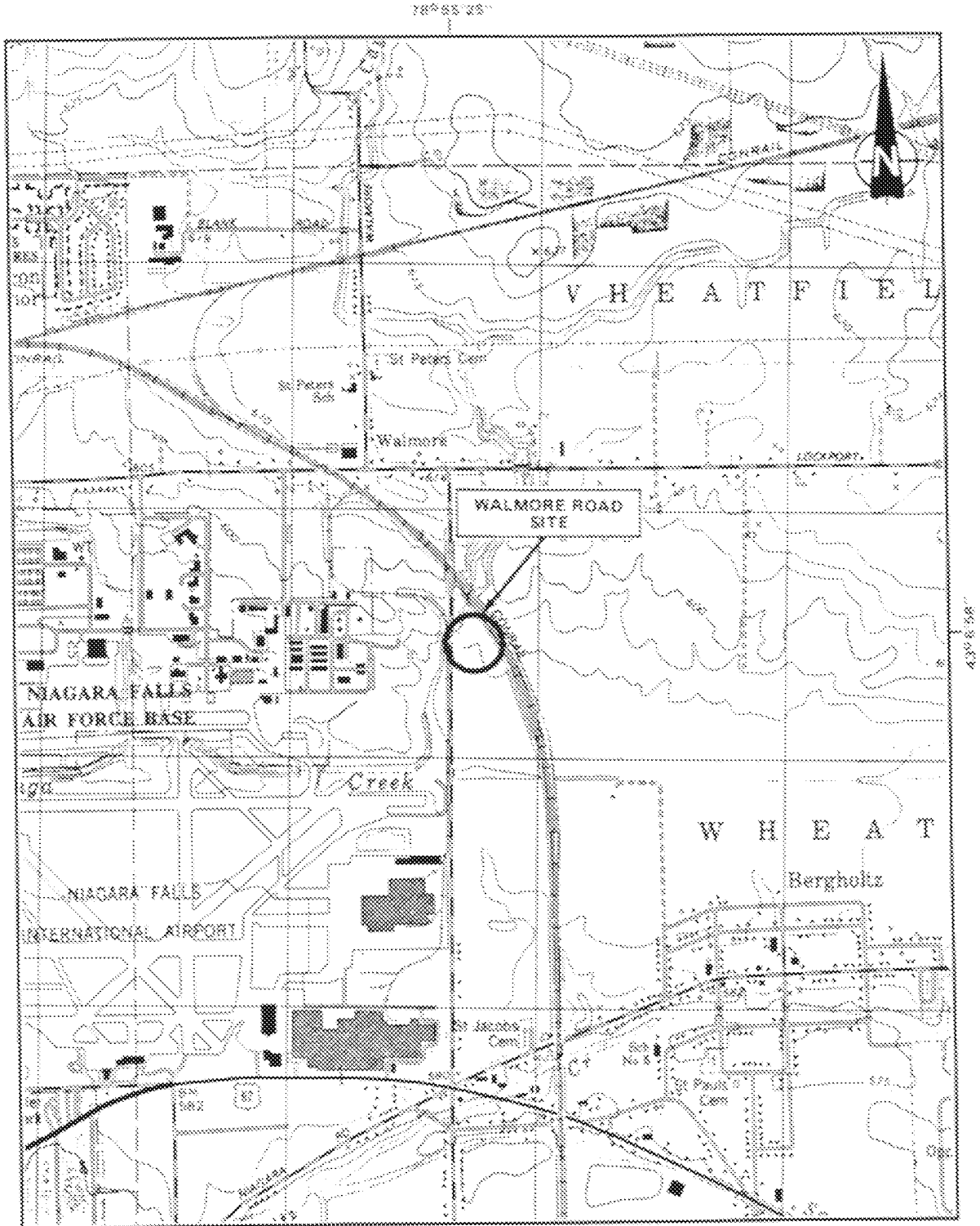

Figure 1-1
LOCATION MAP, WALMORE ROAD-JOHNSON PROPERTY SITE

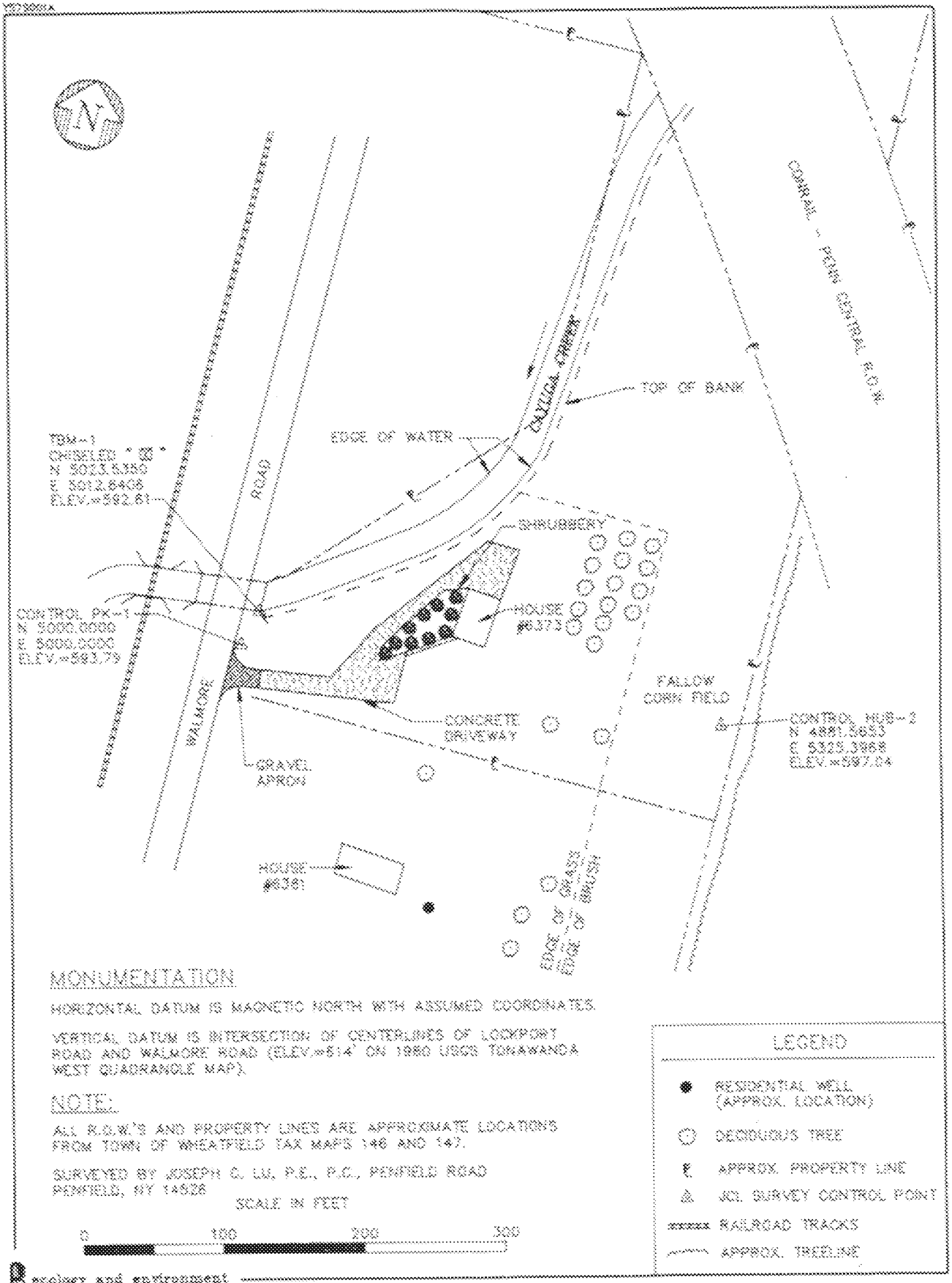

Figure 1-2 SITE MAP
WALMORE ROAD - JOHNSON PROPERTY

New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation

REGISTRY SITE CLASSIFICATION DECISION

1. Site Name Walmore Road - Johnson Property	2. Site No. 932103	3. Town/City/Village Wheatfield	4. County Niagara
5. Region 8	6. Classification Current: 2a Proposed: Delist Modify:		

7. Location of Site (see Figure 1-1 for site location)
a. Quadrangle: Tonawanda West b. Site Latitude: 43°06'58" Longitude: 78°53'25" c. Tax Map Number: 147.05-1-70.113

8. Briefly Describe the Site (see Figure 1-2 for site plan)

The site consists of approximately 0.8 acre of fill on a 2.3 acre parcel of privately-owned residential land. The fill was emplaced prior to 1980 when the existing house was converted from a barn. In 1984, a copper water supply line in the fill corroded, isolating concern. Based on borings, the fill consists of soil, graphite, ash, and minor amounts of slag, concrete, wood, etc.

a. Area 0.8 acre b. EPA ID Number NYD070114463
c. Completed: ☒ Phase I ☐ Phase II ☒ PSA ☐ RI/FS ☐ PA/SI ☐ Other

9. Hazardous Wastes Disposed

No documentation of hazardous waste disposal discovered. No fill samples collected during the PSA exhibited the characteristics of RCRA hazardous waste.

10. Analytical Data Available (see Figure 1-1 for sample locations)
a. ☐ Air ☐ Groundwater ☒ Surface Water ☒ Soil ☒ Waste ☒ EPTox ☐ TCLP

b. Contravention of Standards or Guidance Values

Aluminum (279 to 694 µg/L) exceed Class C standards in three surface water samples. Iron (891 µg/L) exceeded the Class C standard in one surface water sample. However, none were directly attributable to the site. No groundwater samples collected. No standards or guidance values for other media samples.

11. JUSTIFICATION FOR CLASSIFICATION DECISION

See number 9 above.

12. Site Impact Data
a. Nearest surface water: Distance 0 ft. Direction North Classification C
b. Nearest groundwater: Depth 6 ft. Flow Direction unknown ☐ Sole Source ☐ Primary ☐ Principal
c. Nearest water supply: Distance 16,000 ft. Direction north Active? ☒ Yes ☐ No
d. Nearest building: Distance 10 ft. Direction east Use Residential
e. In State Economic Development Zone? ☐ Yes ☒ No i. Controlled site access? ☐ Yes ☒ No
f. Crops or livestock on site? ☐ Yes ☒ No j. Exposed hazardous waste? ☐ Yes ☒ No
g. Documented fish or wildlife mortality? ☐ Yes ☒ No k. PA Score = 11
h. Impact on special status fish or wildlife resource? ☐ Yes ☒ No l. For Class 3: Priority Category _____

13. Site Owner's Name T. Dean & Pamela Johnson, Jr.	14. Address 4169 Purdy Road, Lockport, NY 14094	15. Telephone Number

16. Preparer	17. Approved
_____ Signature Date _____ Name, Title, Organization	_____ Signature Date _____ Name, Title, Organization

CLASSIFICATION WORKSHEET

Site: Walmore Road - Johnson Property County: Niagara Region: 9

1. Hazardous waste disposed? ☐ Yes (go 2) ☒ No (Stop) ☐ Unknown (Stop)

2. Consequential amount of hazardous waste? ☐ Yes (go 3) ☐ No (Stop) ☐ Unknown (go 3)

3. Part 375-1.4(a)(1) applies? ☐ No (go 4) ☐ Unknown (go 4)

☐ Yes (as checked below; Class 2; go 5)

☐ a. endangered or threatened species
☐ b. streams, wetlands, or coastal zones
☐ c. bioaccumulation
☐ d. fish, shellfish, crustacea, or wildlife
☐ e. fire, spill, explosion, or toxic reaction
☐ f. proximity to people or water supplies

4. Part 375-1.4(a)(2) applies? ☐ No (Class 3; Stop) ☐ Unknown (Class 2a; Stop)

☐ Yes (Class 2; go 5)

5. Factor(s) considered in making this determination:

No documentation of hazardous waste disposal and fill samples did not exhibit the characteristics of RCRA hazardous waste.

SUMMARY

Consequential Hazardous Waste: ☐ Yes ☒ No ☐ Unknown

Significant Threat: ☐ Yes ☒ No ☐ Unknown

Proposed Classification: Delist Site Number: 932130

September 1994
Date

Signature and Title

2. SITE HISTORY

The Walmore Road-Johnson Property site is a filled area located on residential property at 6373 Walmore Road in the Town of Wheatfield. A private residence is located on the property immediately adjacent to the filled area. This residence was converted from a barn in 1979 to 1980 by property owners T. Dean and Pamela Johnson, Jr. The barn was formerly part of a farm encompassing the nearby fields.

Prior to the barn conversion, landfilling of industrial materials occurred in what was reported to be an approximately 2-acre area north, south, and west of the barn. A 1968 aerial photograph showed an area of disturbance west of the barn and south of Cayuga Creek including the front yard of the adjacent house to the south (6381 Walmore Road) (E & E 1991).

At the time of the barn conversion, a water line and septic tank were installed to service the residence. The water line ran from the Town of Wheatfield's 10-inch diameter, asbestos-concrete, water main along Walmore Road to the residence. In 1984 the property owner noticed a loss of water pressure at the residence. Upon excavation the copper water line was found to be corroded, and was subsequently replaced by a PVC water line (Johnson 1987). No water pressure problems have been reported by the property owner since this new water line was installed. The Wheatfield water district reported no other customer complaints along Walmore Road due to corrosion (Herman 1988).

Mr. Johnson reported to NCDOH that the fill is 5 feet deep in some areas and it consisted of graphite, hardened resins, crushed plastic battery cases and similar materials. The fill was reportedly delivered to the site by Haseley Trucking Company (Hopkins 1984b and 1984c). When interviewed in 1991, the trucking company representative reported no knowledge of the contents or source of the fill (Haseley 1991).

Initially, the site was confused with the nearby Lockport Road-Struzik Property site (see Section 1.4). The Walmore Road-Johnson Property site was first listed in NYSDEC's 1987 Registry of Inactive Hazardous Waste Disposal Sites. The main reason for listing the site was the concern of the property owner regarding the presence of the fill and its possible role in the corrosion of his water pipe. The property owner, however, did not provide documented evidence of hazardous waste disposal at the site other than his allegation that wastes were hauled by Hassley Trucking.

The NYSDEC Registry of Inactive Hazardous Waste Disposal Sites indicates that Bell Aerospace Textron used this site for disposal of heat-treating salt caustic (sic), plastic tank sludge, flyash, scrapwood, and clay (NYSDEC 1992). However, Bell Aerospace Textron has no record of involvement at this site since its current manifest system was not in place until 1981 (Buzawa 1988).

On December 14, 1984, NCDOH collected a groundwater sample from the well at 6373 Walmore Road (the Johnson property) and submitted it to NYSDEC for analysis. This dug well was reportedly 13 feet deep, and the water level was estimated to be 6 feet below grade. This well is currently inactive, but was used for limited irrigation at the time of sampling (Hopkins 1984a). Results indicated that total halogenated organics, lead, chromium, and cadmium were not present above detection limits (Hopkins 1985).

During the tax map search performed in July 1993, the property south of the Johnsons' at 6381 Walmore Road was owned by Kurt R. Larson and Donald J. Warnick. Prior owners include James and Debra Johnson. On January 7, 1985, during ownership by the Johnsons, a groundwater sample was collected from a well at 6381 Walmore Road. This sample was collected and analyzed by Advanced Environmental Systems, Inc. as part of an investigation for the Niagara Falls Tactical Airlift Group. Results indicated that oil and grease, purgeable organic halides, phenols, and lead were not present above detection limits. The total dissolved solids content of this sample was found to be 324 milligrams per liter (mg/L); the total organic carbon content was 7.22 mg/L; and the total organic halide content was 29.2 micrograms per liter (µg/L) (Niagara Falls Tactical Airlift Group 1985).

On January 8, 1985, NCDOH conducted a sanitary survey of James and Debra Johnson's well at 6381 Walmore Road. During this inspection, a groundwater sample was collected and submitted to the Niagara County Laboratory for bacteriological analysis. Results showed that coliform bacteria were present indicating that the supply

was contaminated and unfit for human consumption at the time of sampling. However, NCDOH concluded that this well was properly constructed and located with respect to known sources of pollution and that the contamination was possibly of an incidental origin (Popovici 1985). On June 23, 1993, E & E spoke to the occupants (renters) of 6373 and 6381 Walmore Road. According to the occupant of 6373 Walmore Road, no well was present on the property. The occupant of 6381 Walmore Road indicated that the well on that property had been backfilled in 1987 or 1988. The casing on this well was observed behind the house at 6381 Walmore Road.

In 1987, a Phase I Investigation was performed for NYSDEC by E & E (E & E 1989). This investigation included a review of available records, interviews with appropriate people, and a site inspection. During the June 1987 site inspection, slag was observed in the bank of Cayuga Creek; however, no physical signs of hazardous waste disposal were observed. The record search and interviews conducted to date resulted in no documentation identifying the source of the fill or Bell Aerospace Textron's involvement with disposal at the site. A preliminary HRS score was calculated for the site with a mean route score (S_M) of 2.76 and a direct contact score (S_{DC}) of 8.33. The Phase I Investigation Report concluded that an additional investigation was warranted since no analytical data for the fill material were available.

3. PSA TASK DISCUSSION

Task 1 of the PSA, data records search and assessment, was performed in 1991 by E & E under contract to NYSDEC. The PSA was continued by E & E with fieldwork performed from June 1993 to April 1994. The scope-of-work for the PSA was prepared by NYSDEC and included a phased approach for this site. Based on the surficial sampling and subsurface soil sampling results, NYSDEC concluded that installation and sampling of the groundwater monitoring wells proposed for the second phase of the investigation would not provide significant additional information to achieve the stated purpose.

With minor exceptions, all field tasks were performed in accordance with NYSDEC's abbreviated work plan. Minor variations from the work plan occurred as a result of judgements made in the field, with the concurrence of NYSDEC representatives.

3.1 PSA TASK 1 REPORT

Task 1 of the PSA for the Walmore Road-Johnson Property site was performed by E & E in 1991. This task included a file review, site inspection, and preparation of a report.

A file review and data search were conducted utilizing state, county, municipal, and site-specific sources. This information was compiled from existing data as well as new sources. A preliminary characterization plan for the site was developed after the file review was conducted.

A site inspection was conducted on May 2, 1991 to assess the surface characterization of the site and vicinity, observe evidence, if any, of hazardous substances or wastes present, photograph the site, conduct preliminary air monitoring using a photoionization detector (PID) and a radiation meter, and confirm information obtained from the initial data search. At the time of the inspection there was no physical evidence of hazardous waste disposal. No

leachate was observed during the inspection, and no readings above background levels were noted on the PID or radiation meters. No signs of stressed vegetation or discolored, milky, or sheened water was observed along or in Cayuga Creek for the length of the property. The fill area was level and covered with a layer of topsoil and healthy-looking grass.

The PSA Task 1 Report was submitted to NYSDEC in October 1991. This report concluded that no documentation of hazardous waste disposal exists, and that no documented link could be found between Bell Aerospace Textron and disposal at the site. This report also concluded that the threat posed to groundwater was unknown and that a direct contact threat may exist if the fill was exposed, but that overall, no significant threat to human health or the environment appeared to exist. However, this report recommended additional investigation since no analytical data existed for the fill.

3.2 PRE-FIELD INVESTIGATION

Continuation of the PSA for the Walmore Road-Johnson Property site involved several field tasks as described in the following sections. Prior to initiating field activities, E & E performed several other tasks. In June 1993, E & E submitted the Project Management Work Plan to NYSDEC for approval. This document included the abbreviated technical work plan prepared by NYSDEC for the site as well as a technical approach for the management and performance of the field tasks, laboratory analyses, report preparation, etc.

In June 1993, E & E also submitted the General Health and Safety Plan (HASP) and draft Quality Assurance Project Plan (QAPjP) to NYSDEC for review. This document outlined the health and safety procedures and protocols to be followed during site characterization sampling and field activities. This document and information gathered during Task 1 of the PSA were used to generate a site-specific safety plan.

In August 1993, E & E submitted the final QAPjP to NYSDEC for approval. The QAPjP presents the policies, organization, objectives, functional activities, and specific quality assurance (QA) and quality control (QC) activities implemented for this project. The QAPjP was designed in accordance with all NYSDEC and United States Environmental Protection Agency (EPA) guidance documents to ensure that all technical data generated by E & E's Analytical Services Center (ASC) meet specified data quality objectives.

In addition to preparation of these documents, the gathering of tax maps and a site reconnaissance were performed. The site walkover was conducted by E & E on June 23,

1993. Neither physical evidence of hazardous waste disposal nor stressed vegetation was observed. The agricultural fields east of the site were inactive, but fruit trees and a vegetable garden were present east of the house at 6373 Walmore Road. The well at 6381 Walmore Road immediately south of the site was found, but subsequent conversations with the occupants revealed the well was backfilled in 1987 or 1988. The occupant of 6373 Walmore Road reported that no well was present at that address.

3.3 GEOPHYSICAL INVESTIGATION

A geophysical survey was performed at the site by E & E on August 18, 1993. The results pertaining to this investigation are included in Appendix B of this PSA report. The survey was performed to delineate the extent of fill and aid in locating the proposed boreholes. Two survey grids were established to achieve these goals. Grid 1, with maximum dimensions of 240 by 120 feet, was located across the front yards of 6373 and 6381 Walmore Road. This grid extended from the south bank of Cayuga Creek to the driveway on the south side of 6381 Walmore Road. Grid 2, with maximum dimensions of 220 by 60 feet, was located in the backyard of 6373 Walmore Road and extended south to 6381 Walmore Road (see Appendix B).

The geophysical survey was performed using an EG&G Geometrics model G-856 proton precession magnetometer and a Geonics Limited model EM31 ground conductivity meter. One reading was recorded with the magnetometer at each grid station, and four readings were recorded with the conductivity meter, one in each instrument orientation (see Appendix B).

Several contour maps of each survey grid were generated to illustrate the geophysical results. Irregular magnetic gradient fluctuations occurred throughout most of the northern and western portions of Grid 1. High conductivity readings were also detected in these areas in both the horizontal and vertical dipole modes. Based upon the results, it appears that the fill covers approximately 0.8 acre and includes the front yard of 6373 Walmore Road and a portion of the front yard at 6381 Walmore Road. The fill appears to extend from the south bank of Cayuga Creek to a northeast-southwest trending line approximately defined by coordinates (0,70) and (120,160) on Grid 1 (see Appendix B). The approximate extent of fill determined by the geophysical survey has been included on Figure 3-1.

In Grid 2, the strongest anomalies detected were caused by surface features. Otherwise, only minor subsurface anomalies were detected, and the conductivity values detected were similar to the unfilled portions of Grid 1. This indicates that fill does not exist in the backyard of 6373 Walmore Road.

Based on these results, six locations within the fill were chosen for the subsurface borings. These locations avoided the strongest magnetic anomalies to prevent drilling in areas where large ferrous materials may have been encountered.

3.4 SOIL BORINGS

Six subsurface soil borings were drilled at the site on September 20, 1993 by Buffalo Drilling Company under the guidance of an E & E geologist and health and safety officer. The locations of these borings are shown on Figure 3-1 and were selected based on the results of the geophysical investigation. The purpose of these borings was to collect fill samples for visual and analytical characterization (see Table 3-1). The boreholes were drilled with 4 1/4-inch inner-diameter hollow-stem augers, and subsurface samples were collected with a 2-foot split-spoon sampler, according to American Society for Testing and Materials (ASTM) designation D-1586.

Subsurface logs for each of the boreholes were prepared and are included in Appendix C. At each borehole location, approximately 1/2 foot of sod and topsoil were encountered. Beneath this topsoil, borehole B-1 consisted entirely of soil fill of local derivation containing mixed grain sizes (clay through gravel). Water was encountered in B-1 at approximately 4.8 feet BGS. Boreholes B-4 and B-5 also consisted primarily of locally derived soil fill. However, B-5 contained slag and concrete fragments mixed in the soil and B-4 contained minor amounts of slag as well as an unusual grayish purple silt between 4 and 5 feet below ground surface (BGS). Boreholes B-6 and B-3 both contained approximately 1/2 foot of topsoil underlain by locally derived soil fill to a depth of about 1 foot. Below this, a gray to black graphite waste and/or flyash was encountered. This fine-grained material looked like graphite dust, but had an ash-like consistency. Some iron oxide staining was also observed in each borehole. In B-6, the fill was underlain by what appeared to be native yellow-brown clayey sand with silt at a depth of 4.4 feet. In B-3, the graphite/flyash fill was underlain by a mixture of this fill with brown silty clay. This was in turn underlain by native reddish brown varved clay with occasional silt and sand layers at a depth of 6.5 feet. The

subsurface boring logs in Appendix C include a more detailed description of the material encountered in each borehole.

The native soils encountered were consistent with those expected. The United States Department of Agriculture (USDA) soil survey for Niagara County (1972) describes the soil which existed prior to filling as the Schoharie series. Schoharie soils generally consist of 12 inches of silty to silty clay loam overlying silty clay to clay to a depth of 30 inches. The soil below 30 inches is described as varved silt and clay. The typical pH of Schoharie soils range from 6.1 to greater than 7.6. Permeability of the varved silt and clay is expected to be less than 0.2 inches per hour (USDA 1972).

Bedrock was not encountered during borehole drilling but likely exists at a depth of 15 to 20 feet BGS. The well at 6373 Walmore Road was reportedly installed in the overburden at a depth of 13 feet (Hopkins 1984a). In the vicinity of the site, bedrock is typically first encountered at between 5 and 22 feet BGS. The bedrock in the area is the Lockport Dolostone, a heavily jointed and fractured unit of high secondary porosity. The Lockport Dolostone is generally overlain by glacial till which is in turn overlain by lacustrine deposits like the varved silt and clay described above. The thickness of these overburden deposits is rarely greater than 20 feet (Johnston 1964).

3.5 SAMPLING

Surface water, sediment, and surface soil samples were collected at and around the site by E & E on June 23, 1993. Subsurface soil/fill samples were collected on September 20, 1993 from the boreholes described above. Eight additional subsurface fill samples were collected by E & E on April 29, 1994 (see Figure 3-1). Sample locations were chosen with the concurrence of the NYSDEC field representative and were based on information provided in NYSDEC's abbreviated work plan for the site. All sample collection, shipping, handling, and analytical procedures were performed in accordance with the QAPjP (E & E 1993c). Additionally, field and sampling procedures were performed in accordance with the work plan (E & E 1993a), and HASP (E & E 1993b). Sample analysis was performed by E & E's ASC in accordance with NYSDEC's 1991 Analytical Services Protocol.

Data summary forms are provided in Appendix D for all analyses performed. Tables 3-2 through 3-10 present the compounds and analytes detected by media. Tentatively identified compounds (TICs) are presented in the data summary forms (see Appendix D).

3.5.1 Subsurface Soil/Fill

On September 20, 1993, three subsurface soil/fill samples were submitted for Target Compound List (TCL) organic and inorganic analyses. On the same date, eight additional samples were submitted for selected RCRA hazardous waste characteristics testing including metals according to the extraction procedure (EP) toxicity method, total solids, reactivity (total cyanide and total sulfide), corrosivity (pH), and ignitability (see Table 3-1). One matrix spike/matrix spike duplicate (MS/MSD) sample set was collected for QA/QC purposes. These samples were collected during the drilling of the soil borings previously discussed.

In the three samples submitted for full TCL analysis, low concentrations of the VOCs 2-butanone, trichloroethene (TCE), 4-methyl-2-pentanone, and toluene were detected in one or more samples (see Table 3-2).

Numerous semivolatile organic compounds were also detected in these samples. Sample B2-1 contained approximately 220 micrograms per kilogram (µg/kg) of PAHs and 39 µg/kg of the PCB Aroclor-1260. Of the PAHs detected, approximately 190 µg/kg were from possible or probable carcinogenic compounds. Table D-1 in Appendix D lists the PAHs analyzed for and indicates those which are considered carcinogenic.

In sample B3-2, approximately 1,400 µg/kg of PAHs were detected including approximately 650 µg/kg of carcinogenic PAHs. B3-2 also contained relatively small amounts of the pesticides 4,4'-DDE and 4,4'-DDD (see Table 3-2).

In sample B6-2, approximately 1,700,000 µg/kg of PAHs were detected including approximately 930,000 µg/kg of carcinogenic PAHs. In addition to these known PAHs, approximately 280,000 µg/kg of unknown PAHs were detected in this sample as TICs (see Appendix D). Sample B6-2 also contained relatively high concentrations of dibenzofuran and carbazole as well as low to moderate concentrations of the pesticides endrin, endrin ketone, endrin aldehyde, 4,4'-DDD, 4,4'-DDT, and methoxychlor (see Table 3-2).

Twenty-one of the 24 inorganics analyzed for were detected in one or more of the subsurface soil/fill samples (see Table 3-3). The results were compared to background concentrations detected in eastern United States soils and other surficial materials (Shacklette and Boerngen 1984). Several metals exceeded the upper limit of the 90th percentile, but none were detected above the observed range (see Table 3-3). The upper limit of the 90th percentile represents the statistical concentration below which 90% of the study's (Shacklette and Boerngen 1984) samples fell. The only metal detected at a concentration of potential

concern was mercury in sample B6-2. While the concentration did not exceed the observed range, mercury was detected at a concentration near the upper limit of the observed range and more than 10 times greater than the upper limit of the 90th percentile. No cyanide was detected in any of the three samples.

Eight subsurface soil/fill samples were analyzed for hazardous waste characteristics including EP toxicity metals. Five metals were detected in the extract from one or more samples (see Table 3-4). However, none were detected at concentrations exceeding regulatory levels. Table 3-5 summarizes the remaining hazardous waste testing results. None of the samples exhibited the characteristics of hazardous waste (6 NYCRR 371.3).

On April 29, 1994, eight subsurface fill samples were collected with a standard split-spoon sampler driven with a pounding sleeve in order to further characterize the fill. These samples were submitted for EP toxicity organic compound (pesticide and herbicide) analysis. Sample identifications, depths, and brief descriptions appear in Table 3-11. Samples B-2X, B-3X, and B-6X were collected from the locations of existing borings B-2, B-3, and B-6, respectively. The remaining samples were collected from areas that were not previously sampled. These locations are identified as B-7, B-8, and B-9 on Figure 3-1. One sample, B-7X, was collected from location B-7; two samples were collected from both locations B-8 and B-9. One additional location, B-10, was split-spoon sampled at the location shown on Figure 3-1, but no samples were collected for chemical analysis. Subsurface logs for split spoon sample locations B-7 through B-10 are included in Appendix C. No pesticides or herbicides were detected in any of these samples.

3.5.2 Surface Soil

Three surface soil samples were collected from 0 to 4 inches below the ground surface by E & E on June 23, 1993. All three locations were off the fill area near the edge of the mowed lawn behind both 6373 and 6381 Walmore Road (see Figure 3-1). Sample SS-2 was moved east of its proposed location to avoid a mound of suspected fill between the houses. It was later pointed out by the resident of 6373 Walmore Road that this mound was not fill, but the remains of the foundation of a smokehouse used when the property was a farm.

The samples were analyzed for TCL organics and inorganics. One MS/MSD sample set was collected and analyzed for QA/QC purposes. No VOCs were detected in the surface

soil samples. Numerous semivolatiles were detected in one or more samples including diethylphthalate, PAHs, and pesticides (see Table 3-6). Since it was not detected in the laboratory method blank, diethylphthalate is not directly attributable to background contamination. However, phthalates commonly result from field and/or laboratory contamination at concentrations such as that in SS-2. Sample SS-1 contained approximately 620 µg/kg of PAHs, of which approximately 340 µg/kg were from carcinogenic PAHs. Sample SS-2 contained approximately 98 µg/kg of PAHs, all of which were from carcinogenic compounds. SS-2 also contained low concentrations of the pesticides 4,4'-DDE and 4,4'-DDT. Sample SS-3 contained approximately 870 µg/kg of PAHs, of which approximately 480 µg/kg were from carcinogenic PAHs. SS-3 also contained a small amount of 4,4'-DDE (see Table 3-6).

The concentrations of individual PAHs detected in the surface soil samples were compared to background concentrations found in agricultural soils (U.S. Department of Health and Human Services 1993). Agricultural soils were chosen for comparison since the property was formerly a farm and neither rural nor urban background concentrations were applicable. The only compounds detected above the expected background concentrations were indeno(1,2,3-cd)pyrene and benzo(g,h,i)perylene (see Table 3-6).

Nineteen of the 24 inorganics analyzed for were detected in one or more of the surface soil samples (see Table 3-7). Results were compared to background concentrations in eastern United States soils. Lead in all three samples and mercury in SS-2 exceeded the upper limit of the 90th percentile; however, no metals exceeded the observed range. Cyanide was not detected in any of the three samples.

3.5.3 Surface Water

Three surface water samples were collected from Cayuga Creek by E & E on June 23, 1993. Sample SW-1 was collected at the railroad crossing approximately 300 feet upstream of the site. Sample SW-2 was collected adjacent to the site. Sample SW-3 was collected at the railroad crossing approximately 90 feet downstream of the site (see Figure 3-1). One MS/MSD sample set was collected for QA/QC purposes. All samples were analyzed for TCL organic and inorganic analytes.

No organic compounds were detected in the surface water samples with the exception of very low concentrations of bis(2-ethylhexyl)phthalate in background sample SW-1 and in

SW-3. While not detected in the laboratory method blank, the presence of this phthalate in these samples is suspected to be the result of laboratory or field contamination.

Fifteen of the 24 inorganics analyzed for were detected in one or more of the surface water samples (see Table 3-8). Cayuga Creek is a Class C stream to which Class C surface water standards apply (6 NYCRR 837). Several of the NYSDEC Class C surface water standards are based on hardness (NYSDEC 1993). Therefore, the hardness of each sample was calculated based on the concentrations of Mg^{2+} and Ca^{2+} and an equation provided in Freeze and Cherry (1979). Hardness results are shown in Table 3-8.

Aluminum and zinc exceeded their respective standards in all three samples. However, the concentrations detected upstream were similar to or greater than those detected at the site and downstream. Iron exceeded the Class C standard in sample SW-3, but was less than five times the background concentration. No other metals exceeded Class C standards, and no cyanide was detected.

3.5.4 Sediment

Three sediment samples were collected from Cayuga Creek by E & E on June 23, 1993. These samples were collected from the same locations as the surface water samples (see Figure 3-1). All three samples were analyzed for TCL organic and inorganic analytes.

No VOCs were detected in the sediment samples; however, several semivolatiles were detected (see Table 3-9). Two phthalate compounds were detected in SED-3 at concentrations not directly attributable to background contamination. However, their presence is not likely site related since neither of these compounds were detected in SED-2 nor in the fill samples. PAHs were detected in all three samples (see Table 3-9). The lowest concentration was detected adjacent to the site in SED-2, and the downstream sample contained less than twice the concentration detected upstream. Therefore, the presence of PAHs in the sediment does not appear to be site related. A low concentration of 4,4'-DDT was detected in SED-2 and low concentrations of 4,4'-DDE and 4,4'-DDT were detected in SED-3.

Seventeen of the 24 inorganics analyzed for were detected in one or more sediment sample (see Table 3-10). When compared to background concentrations in eastern United States soils and other surficial material (Shacklette and Boerngen 1984), it was found that calcium, magnesium, and zinc exceeded the upper limit of the 90th percentile in all three samples but that no metals exceeded the observed range. The presence of calcium,

magnesium, and zinc at elevated levels does not appear to be site related since the downstream concentrations were less than three times the background concentrations or detection limits (see Table 3-10).

3.6 SURVEYING

Following completion of the sampling activities, the site was surveyed by a licensed surveyor to a vertical accuracy of 0.05 feet and a horizontal precision of 1/10,000. The vertical datum used was the centerline of the intersection of Lockport and Walmore roads. This point is shown on the Tonawanda West quadrangle map (USGS 1980) to have an elevation of 614 feet above mean sea level (MSL). The horizontal datum was magnetic north with assumed coordinates. The physical features of the site, Cayuga Creek, and all PSA sampling locations, with the exception of subsurface soil sample locations B-7 through B-10, were surveyed and are shown on Figures 1-2 and 3-1 in this report. Locations B-7 and B-10 were sampled after surveying and were measured with respect to surveyed sample locations. No property lines were surveyed. Instead, Town of Wheatfield tax maps were used to approximate the property boundaries shown in Figure 3-2 (Niagara County Board of Legislators 1991). Sample location coordinates have been included in Table 3-12.

3.7 PA SCORE

The purpose of the PA score is to assist in differentiating sites that pose little or no potential threat to human health and the environment from sites that warrant further investigation based on their potential threat.

The PA score is a screening-level compilation of existing information about a site and its surrounding environment, with an emphasis on obtaining comprehensive information on targets (i.e., populations and resources that might be threatened by a potential release from the site). The PA score is a simplified version of the Hazard Ranking System (HRS), which can be used to quantitatively assess a limited number of factors. A site with an HRS score of 28.5 or greater is eligible for proposal to the National Priorities List.

The factors used to drive the PA score are likelihood of release, targets, and waste characteristics. Likelihood of release is the relative potential of a hazardous substance migrating from the site. Targets represent people, physical resources (drinking water wells or intakes), and environmental resources (sensitive environments) that may be threatened by a

release from the site. Waste characteristics are an estimation of the type and quantity of hazardous waste at the site. These factors are then applied to the various exposure pathways (groundwater, surface water, soil, and air) to derive an overall site score.

The results of PA scoring (out of 100) for the Walmore Road-Johnson Property site are as follows:

- Overall site score: 11
- Groundwater pathway score: 2
- Surface water pathway score: 10
- Soil pathway score: 20
- Air pathway score: 4

A release to groundwater is possible since fill material was encountered to a depth of eight feet in on-site borings and groundwater was encountered at a depth of five feet. However, no groundwater wells are suspected or reported to be contaminated by the site. No significant release to surface water was observed.

Because people are currently living in the area of observed contamination, the soil pathway is considered the major exposure route. There is also potential for exposure to on-site residents via the air pathway if future site activities include excavation of the fill.

Table 3-1

SUBSURFACE SOIL BORING AND SAMPLING SUMMARY
SEPTEMBER 20, 1993

Borehole	Ground Elevation (feet above MSL)	Depth Drilled (feet)	Depth to Bottom of Fill (feet)	Sample Number	Sample Depth (feet)	Analysis
B-1	592.75	9	~8	B1-2	5-5.3 + 7-7.3	RCRA
B-2	594.25	6	>5.5	B2-1	2-3.5	Full TCL
	---	---	---	B2-2	4.5-5	RCRA
B-3	594.20	8	6.5	B3-1	1-3	RCRA
	---	---	---	B3-2	5-6	Full TCL
B-4	594.28	8	>7.2	B4-1	4-5	RCRA
	---	---	---	B4-2	6-7	RCRA
B-5	595.17	6	>5	B5-1	1-3	RCRA
	---	---	---	B5-2	4-5	RCRA
B-6	594.47	6	4.4	B6-1	1-2	RCRA
	---	---	---	B6-2	4-5	Full TCL

Key:

RCRA = RCRA hazardous waste characteristics (6 NYCRR 371.3). Includes EP toxicity metals, reactivity, corrosivity, and ignitability.

Full TCL = Target Compound List organics and inorganics.

Table 3-2

ORGANIC COMPOUNDS DETECTED IN SUBSURFACE SOIL/FILL SAMPLES
WALMORE ROAD-JOHNSON PROPERTY SITE
(all values reported in µg/kg)

Compound	B2-1 (2-3.5 feet)	B3-2 (5-6 feet)	B6-2 (4-5 feet)
Volatiles			
2-Butanone	5 J	13	ND
Trichloroethene	10 J	ND	3 J
4-Methyl-2-pentanone	ND	ND	9 J
Toluene	ND	ND	1 J
Semivolatiles			
Total PAHs	220 J	1,400 J	1,700,000 J
Dibenzofuran	ND	ND	9,200 J
Carbazole	ND	ND	51,000 J
4,4'-DDE	ND	6.7	ND
Endrin	ND	ND	40 J
4,4'-DDD	ND	7.8	39 J
4,4'-DDT	ND	ND	55 J
Methoxychlor	ND	ND	1,200
Endrin ketone	ND	ND	180 J
Endrin aldehyde	ND	ND	67 J
Aroclor-1260 (PCB)	39	ND	ND

Note: Samples collected September 20, 1993.

Key:

J = Reported value is estimated.
ND = Not detected.

Table 3-3

INORGANIC ANALYTES DETECTED IN SUBSURFACE SOIL/FILL SAMPLES
WALMORE ROAD-JOHNSON PROPERTY SITE
(all values reported in mg/kg)

Analyte	B2-1 (2-3.5 feet)	B3-2 (5-6 feet)	B6-2 (4-5 feet)	Background Concentrations in Eastern U.S. Soils[a]	
				Upper Limit of the 90th Percentile	Observed Range
Aluminum	11,800	11,300	6,230	128,000	7,000 - > 100,000
Arsenic	5.6	4.4	8.1	18.0	0.1 - 73
Barium	118	79.2	67.7	867	10 - 1,500
Beryllium	0.60	0.58	0.46	1.81	< 1 - 7
Cadmium	0.79	1.1	4.2	NA	0.01 - 7.0[b]
Calcium	41,000	3,440	24,500	14,400	100 - 280,000
Chromium	18.2	16.2	38.8	112	1 - 1,000
Cobalt	11.9	14.1	33.1	19.8	< 0.3 - 70
Copper	19.4	39.1	149	48.7	< 1 - 700
Iron	18,600	17,700	77,300	54,100	100 - > 100,000
Lead	30.6	22.7	92.8	33.6	< 10 - 300
Magnesium	21,900	3,360	4,880	10,700	50 - 50,000
Manganese	504	743	468	1,450	< 2 - 7,000
Mercury	ND	ND	2.9	0.365	0.01 - 3.4
Nickel	24.6	30.9	67.2	38.2	< 5 - 700
Potassium	1,190	1,100	ND	23,500	50 - 37,000
Selenium	ND	ND	0.36	0.941	< 0.1 - 3.9
Sodium	332	174	337	17,400	< 500 - 50,000
Thallium	ND	ND	0.34	13.8	2.2 - 23
Vanadium	25.0	26.4	53.2	140	< 7 - 300
Zinc	117	341	349	104	< 5 - 2,900

Note: Samples collected September 20, 1993.

[a] Shacklette and Boerngen 1984, except as noted.
[b] Dragun 1988.

Key:

NA = Not available.
ND = Not detected.
Shaded values exceed the upper limit of the 90th percentile but not the observed range.

Table 3-4

EXTRACTION PROCEDURE TOXICITY METALS RESULTS FOR
SUBSURFACE SOIL/FILL SAMPLES
WALMORE ROAD-JOHNSON PROPERTY SITE
(all values reported in µg/L)

Analyte	B1-2 (5-5.3 feet + 7-7.3 feet)	B2-2 (4.5-5 feet)	B3-1 (1-3 feet)	B4-1 (4-5 feet)	B4-2 (6-7 feet)	B5-1 (1-3 feet)	B5-2 (4-5 feet)	B6-1 (1-2 feet)	Regulatory Level[a]
Barium	826	305	23.3	645	382	601	960	261	100,000
Cadmium	16.0	6.2	ND	10.2	10.1	ND	3.2	2.7	1,000
Chromium	13.9	14.4	ND	ND	ND	ND	ND	ND	5,000
Lead	169	ND	ND	ND	ND	ND	ND	ND	5,000
Silver	ND	5.6 J	ND	ND	ND	ND	ND	ND	5,000

Note: Samples collected September 20, 1993.

[a] 6 NYCRR 371.3.

Key:

J = Reported value is estimated.
ND = Not detected.

Table 3-5

HAZARDOUS WASTE CHARACTERISTICS RESULTS FOR
SUBSURFACE SOIL/FILL SAMPLES
WALMORE ROAD-JOHNSON PROPERTY SITE

	B1-2 5-5.3 & 7-7.3 feet	B2-2 4.5-5 feet	B3-1 1-3 feet	B4-1 4-5 feet	B4-2 6-7 feet	B5-1 1-3 feet	B5-2 4-5 feet	B6-1 1-2 feet	Regulatory Level[a]
Solids, total (%)	84	81	66	92	84	83	85	85	NA
Reactivity									
• Cyanide, Total (mg/kg)	2.3	0.85	1.3	0.75	ND	ND	ND	1.4	250
• Sulfide, Total (mg/kg)	47	180	ND	48	55	82	23	ND	500
Corrosivity (pH)	7.8	7.6	8.1	8.1	8.0	7.7	8.6	6.9	2< pH <12.5
Ignitability	No flash @ 140°F	No flash @ 140°F	No flash @ 140°F	No flash @ 140°F	No flash @ 140°F	No flash @ 140°F	No flash @ 140°F	No flash @ 140°F	No flash below 140°F

Note: Samples collected September 20, 1993.

[a] 6 NYCRR 371.3.

Key:

ND = Not detected.
NA = No applicable level.

Table 3-6

ORGANIC COMPOUNDS DETECTED IN SURFACE SOIL SAMPLES
WALMORE ROAD-JOHNSON PROPERTY SITE
(all values reported in µg/kg)

Compound	SS-1	SS-2	SS-3	Background PAH Concentrations in Agricultural Soils[a]
Volatiles	ND	ND	ND	---
Semivolatiles				
Diethylphthalate	ND	98 J	ND	---
Total PAHs	620 J	98 J	870 J	NA
* Phenanthrene	48 J	ND	ND	48 - 140
* Fluoranthene	96 J	ND	74 J	120 - 210
* Pyrene	81 J	46 J	67 J	99 - 150
* Benzo(a)anthracene	50 J	ND	ND	56 - 110
* Chrysene	64 J	ND	54 J	78 - 120
* Benzo(b)fluoranthene	77 J	52 J	130 J	58 - 250
* Benzo(k)fluoranthene	39 J	ND	43 J	58 - 220
* Benzo(a)pyrene	49 J	ND	ND	4.6 - 900
* Indeno(1,2,3-cd)pyrene	59 J	ND	200 J	63 - 100
* Dibenz(a,h)anthracene	ND	ND	57 J	NA
* Benzo(g,h,i)perylene	55 J	ND	240 J	66
4,4'-DDE	ND	1.5 J	2.9 J	---
4,4-DDT	ND	1.7 J	ND	---

Note: Samples collected June 23, 1993.

[a] U.S. Department of Health and Human Services 1993.

Key:

J = Reported value is estimated.
NA = No applicable PAH concentration provided.
ND = Not detected.

Shaded values exceed applied background range.

Table 3-7

INORGANIC ANALYTES DETECTED IN SURFACE SOIL SAMPLES
WALMORE ROAD-JOHNSON PROPERTY SITE
(all values reported in mg/kg)

Analyte	SS-1	SS-2	SS-3	Background Concentrations in Eastern U.S. Soils[a]	
				Upper Limit of the 90th Percentile	Observed Range
Aluminum	10,800	12,100	5,350	128,000	7,000 - >100,000
Arsenic	5.0	5.1	7.0	16.6	<0.1 - 73
Barium	72.9	100	72.6	857	10 - 1,500
Beryllium	0.63	0.81	0.54	1.81	<1 - 7
Cadmium	ND	0.55	ND	NA	0.01 - 7.0[b]
Calcium	2,370	2,710	3,330	14,400	150 - 280,000
Chromium	16.3	22.5	13.0	112	1 - 1,000
Cobalt	12.1	18.8	11.5	18.8	<0.3 - 70
Copper	20.0	29.9	33.5	48.7	<1 - 700
Iron	20,000	24,600	18,400	54,100	100 - >100,000
Lead	38.4	61.9	67.7	33.0	<10 - 300
Magnesium	3,290	4,220	1,570	10,700	50 - 50,000
Manganese	351	576	913	1,459	<2 - 7,000
Mercury	0.11	0.12	0.38	0.265	0.01 - 3.4
Nickel	19.8	23.8	14.1	38.2	<5 - 700
Potassium	772	1,159	1,160	23,500	50 - 37,000
Selenium	ND	0.45	0.62	0.941	<0.1 - 3.9
Vanadium	28.4	38.1	20.1	140	<7 - 300
Zinc	64.2	61.7	66.4	104	<5 - 2,800

Note: Samples collected June 23, 1993.

[a] Shacklette and Boerngen 1984, except as noted
[b] Dragun 1988.

Key:

NA = No applicable value given.
ND = Not detected.

Shaded values exceed the upper limit of the 90th percentile but not the observed range.

Table 3-8

INORGANIC ANALYTES DETECTED IN SURFACE WATER SAMPLES
WALMORE ROAD-JOHNSON PROPERTY SITE
(all values reported in µg/L except as noted)

Analyte	Background SW-1	SW-2	SW-3	NYSDEC Class C Surface Water Standard[a]
Aluminum	471	279	694	100
Arsenic	ND	1.1	1.1	190
Barium	58.5	58.6	59.2	NA
Calcium	110,000	113,000	121,000	NA
Chromium	ND	ND	13.6	661/674/689[b]
Copper	2.7	2.5	2.5	39.7/40.5/42.1[b]
Iron	193	230	891	300
Lead	1.7	1.2	1.8	19.4/20.0/21.1[b]
Magnesium	33,700	34,300	34,150	NA
Manganese	37.8	40.8	58.9	NA
Nickel	ND	ND	10.9	281/286/296[b]
Potassium	1,690	3,370	8,140	NA
Selenium	ND	ND	1.0	1.0
Sodium	35,100	36,350	35,300	NA
Zinc	612	588	573	30
Hardness (mg/L as $CaCO_3$)	413	423	442	NA

Note: Samples collected June 23, 1993.

[a] NYSDEC 1993.
[b] Standard is a function of hardness as respectively shown.

Key:

NA = No applicable standard or guidance value.
ND = Not detected.

Shaded values exceed the Class C standard.

Table 3-9

ORGANIC COMPOUNDS DETECTED IN SEDIMENT SAMPLES
WALMORE ROAD-JOHNSON PROPERTY SITE
(all values reported in µg/kg)

Compound	Background SED-1	SED-2	SED-3
Volatiles	ND	ND	ND
Semivolatiles			
Diethylphthalate	ND	ND	630
Butylbenzylphthalate	ND	ND	54 J
Total PAHs	1,500 J	880 J	2,300 J
4,4'-DDE	ND	ND	3.9 J
4,4'-DDD	ND	ND	3.2 J
4,4'-DDT	ND	2.0 J	ND

Note: Samples collected June 23, 1993.

Key:

J = Reported value is estimated.
ND = Not detected.

Table 3-10

INORGANIC ANALYTES DETECTED IN SEDIMENT SAMPLES
WALMORE ROAD-JOHNSON PROPERTY SITE
(all values reported in mg/kg)

Analyte	Background SED-1	SED-2	SED-3	Background Concentrations in Eastern U.S. Soils[a]	
				Upper Limit of the 90th Percentile	Observed Range
Aluminum	2,100	1,850	2,500	128,000	7,000 - >100,000
Arsenic	1.9	2.1	3.3	18.0	<0.1 - 73
Barium	18.9	28.4	57.3	867	10 - 1,500
Cadmium	ND	1.3	2.0	NA	0.01 - 7.0[b]
Calcium	57,200	76,100	67,600	14,400	100 - 280,000
Chromium	9.3	4.4	9.4	112	1 - 1,000
Cobalt	5.9	5.3	5.5	19.8	<0.3 - 70
Copper	11.9	7.9	10.3	48.7	<1 - 700
Iron	15,400	7,850	9,810	54,100	100 - >100,000
Lead	10.5	28.4	28.4	33.9	<10 - 300
Magnesium	16,100	39,400	34,200	10,700	50 - 50,000
Manganese	440	668	400	1,450	<2 - 7,000
Nickel	9.1	6.9	9.1	38.2	<5 - 700
Potassium	267	292	389	23,500	50 - 37,000
Sodium	105	127	140	17,400	<500 - 50,000
Vanadium	8.2	7.1	9.6	140	<7 - 300
Zinc	319	383	872	104	<5 - 2,900

Note: Samples collected June 23, 1993.

[a] Shacklette and Boerngen 1984, except as noted.
[b] Dragun 1988.

Key:

NA = No applicable value given.
ND = Not detected.

Shaded values exceed the upper limit of the 90th percentile but not the observed range.

Table 3-11

SUBSURFACE FILL SAMPLES COLLECTED APRIL 29, 1994[a]

Boring Number	Sample ID	Sample Depth (feet BGS)	Description
B-2	B-2X	0 - 2	Brown to black loam mixed with graphite/ash
B-3	B-3X	2 - 4	Black graphite
B-6	B-6X	2 - 4	Black sand and slag
B-7	B-7X	0 - 2	Black graphite/ash with some clay
B-8	B-8X	0 - 2	Black graphite/ash with some sandy silt
	B-8Z	2 - 4	Black graphite/ash with minor asbestos-like material
B-9	B-9X	0 - 2	Gray to black graphite/ash with brick fragments
	B-9Z	2 - 4	Black graphite/ash

[a] All samples analyzed for organic compounds according to EP toxicity method.

Table 3-12

SAMPLE LOCATION SURVEY COORDINATES

	Northing[a]	Easting[a]	Elevation[b]
SW/SED-1	5382.3235	5320.9704	589.42
SW/SED-2	5064.9488	5132.5444	587.40
SW/SED-3	5057.2209	4939.4151	587.59
SS-1	5079.7354	5292.5219	596.34
SS-2	4884.1827	5252.4816	593.54
SS-3	4791.3962	5177.4834	592.18
B-1	5039.0450	5049.9975	592.75
B-2	4982.3893	5043.3434	594.25
B-3	4935.5508	5045.8502	594.20
B-4	5031.0437	5093.6957	594.28
B-5	4934.9868	5099.1376	595.17
B-6	4922.9361	5057.1256	594.47
B-7[c]	4928.96	5078.13	
B-8[c]	4939.24	5051.49	
B-9[c]	4957.86	5072.49	
B-10[c]	4980.59	5063.34	

[a] Horizontal coordinates are measured in feet based on magnetic north and assumed coordinates based on temporary benchmark PK-1.

[b] Elevations are in feet above mean sea level based on the elevation of the intersection of Lockport and Walmore roads (USGS 1980).

[c] Split spoon sample locations B-7 through B-10 were not surveyed but were horizontally measured with respect to surveyed borings B-1 through B-6.

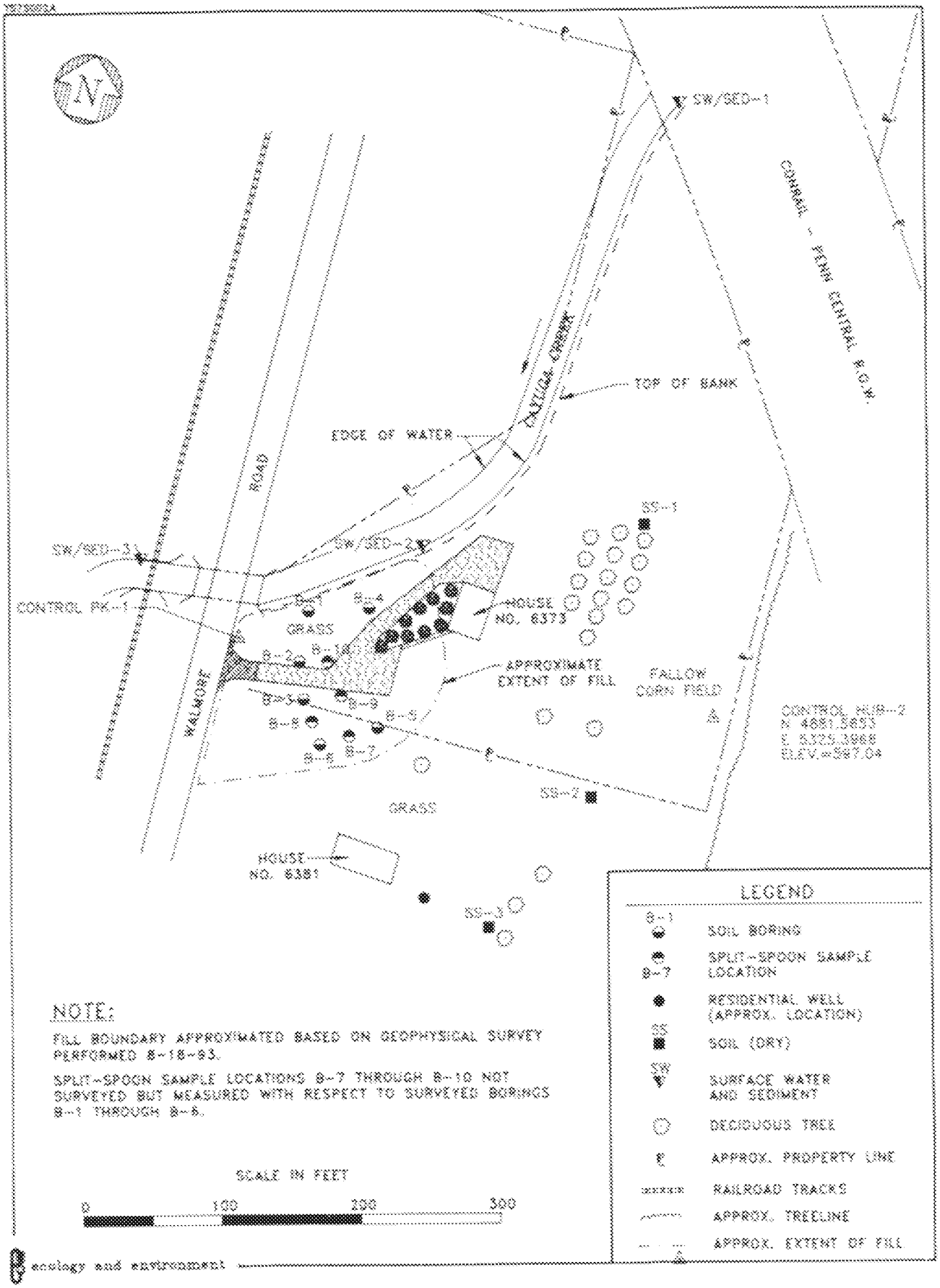

Figure 3-1 SAMPLE LOCATION MAP
WALMORE ROAD -- JOHNSON PROPERTY

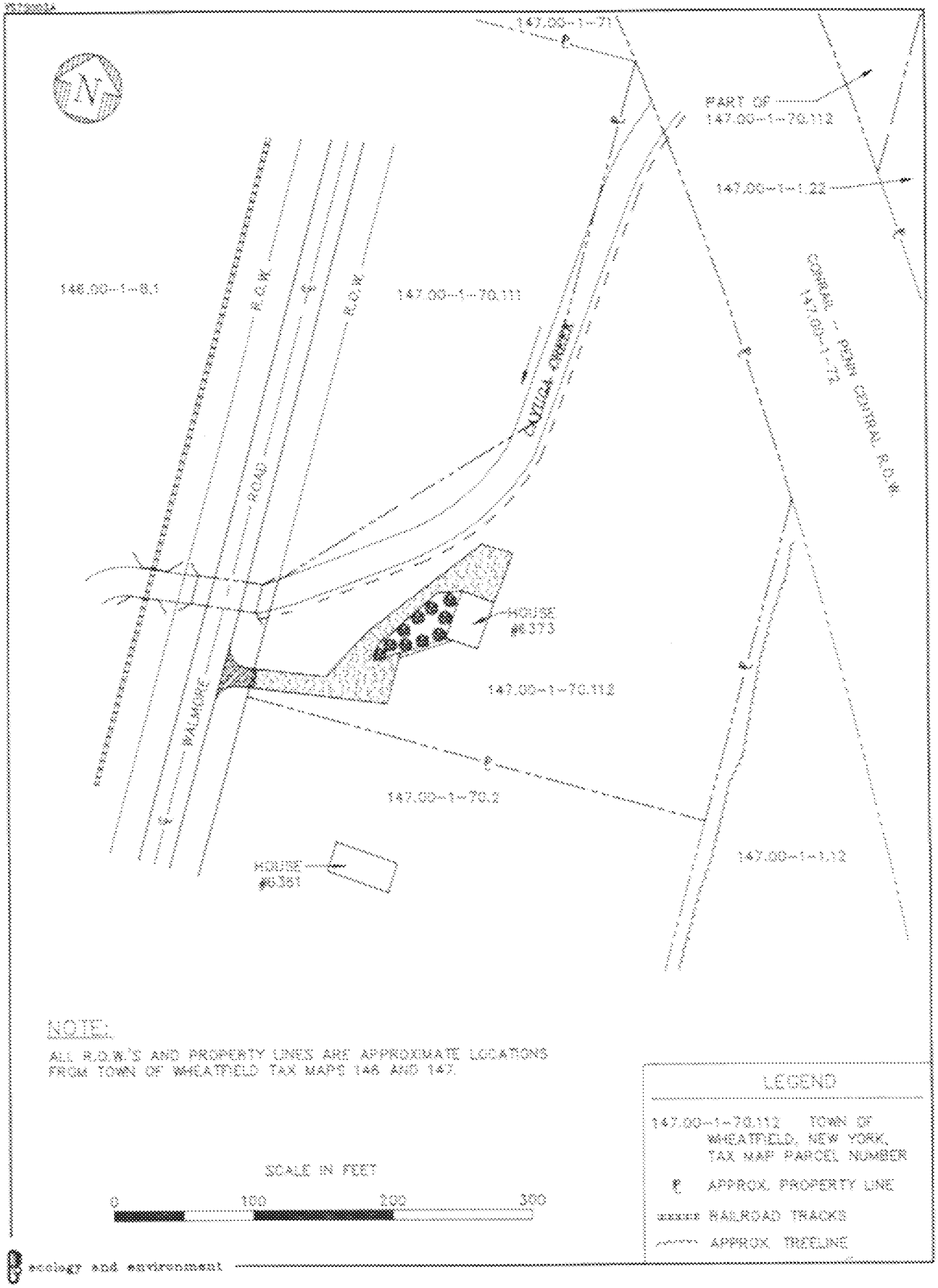

Figure 3-2 SITE PROPERTY BOUNDARY MAP
WALMORE ROAD - JOHNSON PROPERTY

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

PSA activities to date have not resulted in discovery of any documentation pertaining to hazardous waste disposal at the Walmore Road-Johnson Property site. Additionally, no information confirming or disproving a link between Bell Aerospace Textron and disposal at the site was found. The connection between Bell Aerospace Textron and the site may have come from the initial confusion between the site and the nearby Lockport Road-Struzik Property site, where Bell Aerospace Textron is known to have disposed of waste.

Subsurface borings indicate that the fill consists of locally derived soil (primarily clay and silt containing some sand and gravel); wood, concrete, and brick fragments; graphite; flyash; and minor slag. Fill samples collected for TCL organic and inorganic analyses showed low levels of VOCs and a PCB, low-to-moderate levels of pesticides, and moderate-to-high levels of combustion-related products such as PAHs. Mercury was also detected at a concentration near the high end of the observed range of background levels in one sample. However, while several hazardous constituents were detected, the fill did not meet the criteria of a RCRA hazardous waste pursuant to 6 NYCRR 371.3 when analyzed for EP Toxicity metals and organics, reactivity, corrosivity, and ignitability. In particular, the fill was not found to be corrosive. The reported corrosion of Mr. Johnson's water pipe may be a result of electrolysis of the unprotected copper by various metals or reactions with carbon waste found in the fill. Concentrations would not need to be at toxic levels for such reactions to occur.

In all three surface water samples, aluminum and zinc were detected at concentrations exceeding their respective Class C standards. However, their presence does not appear to be site related when compared to the background concentration. Iron exceeded the Class C

standard downstream, but again, it does not appear to be site related since it was not detected at significantly elevated levels on site. Several organic and inorganic analytes were detected at elevated concentrations in the sediment samples. However, when compared to background levels, none appear to be site related.

The most prevalent compounds detected on site were PAHs. PAHs detected in the sediment and surface soil samples collected off of the fill area are widespread and are expected in such a location (near the airport and Air Force Base).

Based on the analytical results and the lack of hazardous waste, the fill does not appear to be adversely impacting the environment or human health. However, potential impacts of the site on groundwater quality are unknown. Based on the compounds detected in the fill and the occurrence of a seasonal high water table (USDA 1972), there exists a potential for an impact on groundwater quality. However, based on the low permeability of the native soil underlying the fill and the lack of contaminants detected in the EP toxicity analyses of the fill, this impact is expected to be minimal. Additionally, since groundwater is not used as a potable source in the vicinity of the site, there is no expected impact to human health.

Since the fill appears to be confined to the front yard, vegetable gardening in the backyard as practiced is not expected to pose a threat. Additionally, the existing cover appears adequate to alleviate the threat of inhalation of dusts or incidental contact. The only foreseeable threat is direct contact with contaminated fill during excavation or other intrusive activities. Overall, the threat posed by the site to human health or the environment appears to be minimal.

4.2 RECOMMENDATIONS

Since no documentation of hazardous waste disposal has been found, none of the fill samples exhibited the characteristics of hazardous waste, and no significant threat is evident, it is recommended that the Walmore Road-Johnson Property site be removed from the Registry of Inactive Hazardous Waste Disposal Sites. The site should be referred to the New York State and Niagara County departments of Health to evaluate the need for proper closure of this fill area. These departments should notify site owners of the presence of fill on the property and monitor the future status and use of the site in order to properly manage the fill.

Alternatively, emplacement of an impermeable cap over the fill area would prevent direct infiltration from reaching the fill, thereby preventing possible groundwater contamination.

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