932001

Admin. Record

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PRELIMINARY SITE ASSESSMENT EVALUATION REPORT OF INITIAL DATA

Volume I

[redacted]. Vanadium Corporation
Town of Niagara

Site No. 932001
Niagara County

Prepared for:

New York State Department of Environmental Conservation

50 Wolf Road, Albany, New York 12233
Thomas C. Jorling, *Commissioner*

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

By:
ABB Environmental Services
Portland, Maine

SEPTEMBER 1993

15 (12-75)

New York State Department of Environmental Conservation

MEMORANDUM

TO: Vanadium Corporation of America - File Site #932001
FROM: Michael Hinton
SUBJECT: Vanadium Corporation

DATE: October 19, 1993

The site name for the former SKW Site #932001 is the Vanadium Corporation of America not the U.S. Vanadium Corporation.

Any reference to the U.S. Vanadium Corporation should be considered to identify Vanadium Corporation of America.

ad

cc: Mr. Sri Maddineni
Mr. E. Joseph Sciascia

NYSDEC SUPERFUND STANDBY CONTRACT
WORK ASSIGNMENT NO. D002472-6.1

PRELIMINARY SITE ASSESSMENT EVALUATION REPORT OF INITIAL DATA VOLUME I

[redacted] VANADIUM CORPORATION SITE TOWN OF NIAGARA, NEW YORK

SITE NO. 932001

Submitted to:

New York State Department of Environmental Conservation
Albany, New York

Submitted by:

ABB Environmental Services
Portland, Maine

September 1993

Prepared by:
Kathleen Maguire, P.E.
Site Manager
ABB Environmental Services

Submitted by:
Glenn L. Daukas, P.G.
Project Manager
ABB Environmental Services

Approved by:
William J. Weber, P.E.
NSSC Program Manager
ABB Environmental Services

shortly after 1984. As defined by Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR), Part 371.4(c), emission control dust from ferrochromium silicon production is a K090 listed hazardous waste (NYSDEC, 1992a). This hazardous waste was disposed of on the SKW and Airco properties and potentially on portions of the Niagara Mohawk and PASNY properties (NYSDEC, 1993).

ABB-ES completed Task 2, preparation of the Site Work Plan, in October 1992 (E.C. Jordan Co., 1992c). ABB-ES prepared a scope of work for the Task 3 field investigation program to develop the data necessary to reclassify the site according to the guidelines set forth in 6 NYCRR, Part 375 (NYSDEC, 1992c). Upon conclusion of the PSA Task 3 activities, a recommendation will be made to reclassify the site to one of the following categories:

Class 2 - Hazardous waste sites presenting a significant threat to public health or the environment; defined by NYSDEC as sites that had release(s) resulting in violation of NYSDEC environmental quality standards and guidelines.

Class 3 - Hazardous waste sites not presenting a significant threat to public health or the environment; NYSDEC defines a significant threat to public health and the environment as a contravention of NYSDEC environmental quality standards and guidelines.

Delist - Sites where hazardous waste disposal is not documented.

[redacted] VANADIUM CORPORATION SITE
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EXECUTIVE SUMMARY

The [redacted] Vanadium Corporation (Vanadium) site (formerly the SKW Alloys, Inc. site) consists of a 25-acre parcel owned by Airco Properties, Inc. (Airco), a 37-acre parcel owned by SKW Alloys, Inc. (SKW), and right-of-ways owned by the Niagara Mohawk Power Corporation (Niagara Mohawk) and the Power Authority for the State of New York (PASNY). The Vanadium site is located on Witmer Road in the Town of Niagara, New York.

From 1920 to 1964, the site was owned by Vanadium. The extent of land owned by Vanadium is not known. Vanadium used portions of the property to dispose of wood, brick, ash, lime slag, ferrochromium silicon slag, and ferrochromium silicon dust. In 1964, Airco purchased 62 acres of the Vanadium property. The site was operated by Airco Carbon (now called Carbon/Graphite Group), a company affiliated with Airco, and wastes similar to those disposed by Vanadium were disposed at the site. In 1979, SKW purchased the western 37 acres of this 62-acre parcel from the Airco Alloys division of Airco. Airco has retained the eastern 25 acres, where it owns and operates a landfill. This Airco landfill was used to dispose of brick, coke, concrete, carbon fines, and graphite plant waste. The landfill is not covered, except for a portion of the south slope (approximately 4 acres) that has a cap consisting of low-permeability soil installed by Airco between 1981 and 1988. The landfill currently is not receiving any wastes. The remaining portion of the Airco property contains exposed waste piles.

SKW maintains two landfill cells on their 37-acre parcel. Both cells were closed before October 1992. Waste disposed of in SKW landfill Cell No. 2 included ferrosilicon and silicon metal baghouse dust. Ferrochromium silicon dusts and

ferrosilicon dust were disposed of in Cell No. 1. Under Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR), Part 371, ferrochromium silicon baghouse dust is a K090 listed hazardous waste (NYSDEC, 1992a and 1993).

Much of the surface of the site contains 0 to 7 feet of fill consisting of fly ash, dust, slag, and cinder materials reportedly disposed of by Vanadium. The Niagara Mohawk/PASNY property and the northern portion of the Airco property contain exposed waste piles also reportedly containing ferromanganese slag, calcium hydroxide, and ferrochromium silicon dusts. Several rusted and crushed 55-gallon containers were observed on and around the waste piles located on both the Airco and Niagara Mohawk/PASNY property. The Vanadium site is currently a Class 3 site listed in the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste Sites (NYSDEC, 1992b).

Sampling performed by SLC Consultants/Constructors between 1979 and 1987 indicated that pH measurements in the shallow and deep water tables, and surface water runoff were recorded in excess of 12.5. These pH measurements classify the samples corrosive and indicate that the media would have to be managed in a manner similar to a D002 corrosive characteristic hazardous waste as defined by New York State hazardous waste regulations (6 NYCRR Part 371.3(c)(1)(i)) (Yeman, 1993). In addition, the groundwater contained levels of inorganics including chromium, hexavalent chromium, manganese, barium, zinc, and iron in excess of New York State Class GA standards. Organic compounds that exceeded the Class GA standards included vinyl chloride, phenol, and trichloroethene.

In 1984, the Radian Corporation conducted Extraction Procedure (EP) Toxicity tests on waste material generated from SKW's plant. A sample of ferrochromium

silicon dust failed EP Toxicity for chromium. Radian Corporation also reported in 1984 that the ferrosilicon dust wastes sampled at the SKW plant failed EP Toxicity for selenium with a leachate concentration of 2 milligrams per liter (mg/L). The regulatory limit is 1 mg/L. The results of this analysis are inconsistent with analysis of the sample for total selenium. If the total selenium result of 0.64 milligrams per kilogram (mg/kg) were correct, the EP Toxicity results could not exceed the maximum permissible concentration. However, an American Society of Testing and Materials leaching procedure was also performed on this sample, resulting in selenium concentrations of 5.3 mg/L. These conflicting results may be due to a nonhomogeneous sample matrix. Sometime after this testing was completed in 1984, the waste stream containing ferrochromium silicon was discontinued (NYSDEC, 1993).

In November 1987, Advanced Environmental Services, Inc., conducted an EP Toxicity analysis on dry dust from silicon metal and ferrosilicon operations at the SKW plant. The analytical results did not show the presence of leachable concentrations of metals (including chromium and selenium) or organic compounds at levels exceeding regulatory hazardous waste characteristic limits. Selenium was detected in the extract at 0.374 mg/L in the silicon metal dust sample and at 0.060 mg/L in the ferrosilicon dust sample. These samples, collected in 1987, most likely did not fail EP Toxicity for chromium and selenium because the waste stream containing ferrochromium silicon was discontinued in 1984. The 1984 Radian Corporation analytical results indicating the presence of chromium and selenium in the waste are considered valid because they were collected while this ferrochromium silicon dust was being generated as a part of the manufacturing process and these wastes were disposed of at the Vanadium site (NYSDEC, 1993).

Interagency Task Force records show that approximately 5,000 tons per year of baghouse dust containing ferrochromium silicon dust were disposed of by Airco Alloys at the Vanadium site from 1971 (when the baghouse was installed) to shortly after 1984. Over the 14 year period, it is estimated that approximately 70,000 tons of this waste was generated and disposed of on site. Under 6 NYCRR 371.4(c), emission control dust or sludge from ferrochromium silicon production is a K090 listed hazardous waste (NYSDEC, 1992a). This hazardous waste was disposed of on the SKW and Airco properties and potentially on portions of the Niagara Mohawk and PASNY properties (NYSDEC, 1993).

ABB Environmental Services, formerly E.C. Jordan Co., under contract to NYSDEC, conducted this Preliminary Site Assessment Task 3 investigation to confirm the presence of hazardous waste at the site and to assist NYSDEC in establishing whether the site poses a significant threat to public health or the environment.

The Task 3 investigation consisted of sampling several media. Eight exposed waste pile samples were collected from the site, including samples from Airco, SKW, and Niagara Mohawk/PASNY properties. Three leachate samples were collected from the SKW landfill leachate collection system. Six collocated surface water and sediment samples were collected from the surface water bodies and drainage ditches, and eight groundwater samples were collected from previously installed monitoring wells.

Task 3 field investigations, conducted in October 1992, indicated no exceedances above regulatory limits for EP Toxicity results from laboratory analyses. However, field pH measurements were in excess of 12.5 for shallow

groundwater/leachate and surface water, which indicates the presence of a D002 corrosive characteristic hazardous waste. The concentration of hexavalent chromium detected in the surface water samples collected upgradient of the disposal area was considerably lower than the concentrations detected in samples collected from or immediately downgradient of the areas of waste. Hexavalent chromium was not detected in surface water samples upgradient and cross-gradient of the site. Low levels of hexavalent chromium were detected where the surface water enters the Airco property. Higher levels were detected downstream on the SKW and Airco properties. These results indicate that the hexavalent chromium contamination seen in the surface water is attributable to the wastes disposed by SKW and Airco on their respective properties.

The pH measured in surface water follows a similar pattern to the concentration of hexavalent chromium detected in the surface water. Lower values of pH were measured in off-site samples as compared to on-site samples, indicating that the elevated pH is attributable to wastes disposed of on site. The comparison of measurements indicates that the waste materials on the site are impacting the pH of the surface water and a D002 corrosive characteristic hazardous waste is present on the SKW and Airco properties (NYSDEC, 1993 and Yeman, 1993).

For the purpose of the Task 3 investigation, significant threat was evaluated by comparing surface water and groundwater sample results to New York State Class C surface water standards as directed by NYSDEC Region 9, and Groundwater Quality Class GA Standards, respectively. Vinyl chloride, trichloroethene, phenol, hexavalent chromium, chromium, cyanide, magnesium, manganese, sodium, and zinc all exceeded their respective groundwater standards. Phenol, iron, and hexavalent chromium exceeded their respective surface water standards. In

addition, exceedances of pH values in the surface water and groundwater indicated a contravention of standards and a significant threat to public health and the environment.

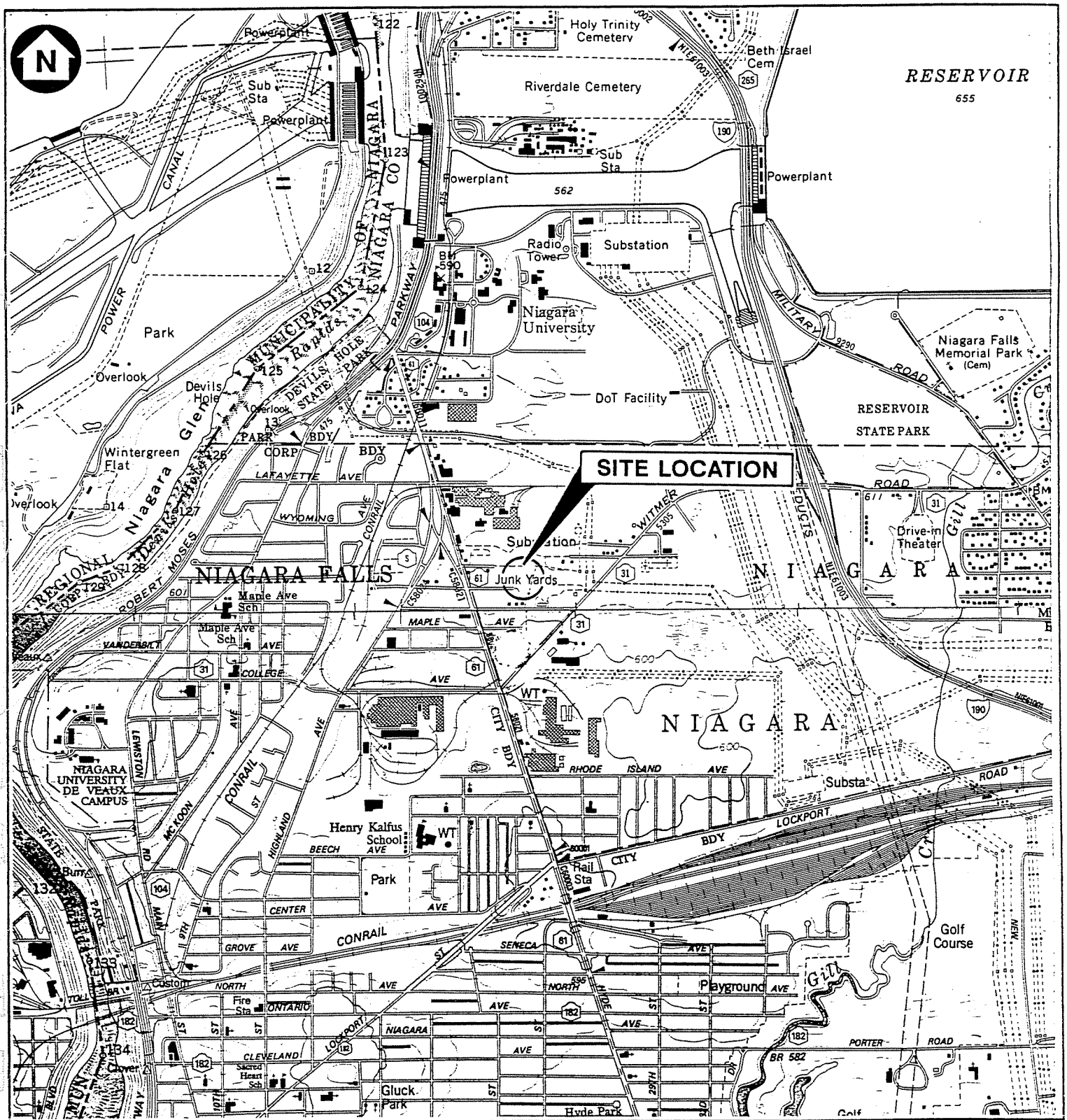
Based on information developed during the Preliminary Site Assessment Task 1 and Task 3 investigations at the U.S. Vanadium Corporation site, it is recommended that the site be reclassified from a Class 3 to a Class 2 hazardous waste site. The presence of hazardous waste and significant threat have both been documented at this location.

The Task 3 activities are reported in two volumes. Volume I presents the project purpose, description of the Task 3 scope of work, results of Task 3 sampling and analysis, and the final recommendation for reclassifying the site. Also included in Volume I are Appendix A, revised Registry Site Classification Decision Form, and Appendix B, revised Site Inspection Form, USEPA Form 2070-13. Volume II, Supporting Documentation, contains the field data records, laboratory results, and Survey Control Report.

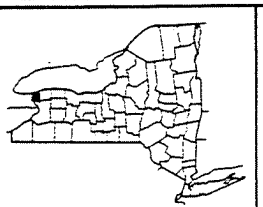
1.0 PURPOSE

ABB Environmental Services (ABB-ES), formerly E.C. Jordan Co., is submitting this Evaluation Report of Initial Data to the New York State Department of Environmental Conservation (NYSDEC) as part of the Preliminary Site Assessment (PSA) of the U.S. Vanadium Corporation (Vanadium) site (formerly the SKW Alloys, Inc. site) located in Niagara, New York (Figure 1-1). This report was prepared in response to Work Assignment No. D002472-6.1 and in accordance with the requirements of the NYSDEC Superfund Standby Contract, Contract No. D002472 dated November 1989, between NYSDEC and ABB-ES.

The Vanadium site is a suspected inactive hazardous waste site recognized by NYSDEC in its registry of *Inactive Hazardous Waste Disposal Sites in New York* (NYSDEC, 1992b). The site (Site No. 932001) is currently listed as a Class 3 site, indicating documented hazardous waste disposal at the site although it is not known to present a significant threat to public health or the environment. The purpose of the Task 3 investigation at the Vanadium site was to confirm documented hazardous waste disposal and establish whether the site poses a significant threat to public health and the environment. Information reviewed in the Task 1 - Data Records Search and Assessment (E.C. Jordan Co., 1991b) indicated the disposal of hazardous waste at the site. A sample of ferrosilicon dust failed Extraction Procedure (EP) Toxicity for selenium and a sample of ferrochromium silicon dust failed EP Toxicity for chromium. Measurements of pH levels exceeded 12.5 in surface water and groundwater/leachate samples indicating the presence of D002 corrosive characteristic hazardous waste (Yeman, 1993). Interagency Task Force records show that baghouse dust containing ferrochromium silicon dust were disposed of by Airco Alloys on site from 1971 to



SOURCE: N.Y.S. DEPARTMENT OF TRANSPORTATION, NIAGARA FALLS AND LEWISTON QUADRANGLE DATED 1989 AND 1976, RESPECTIVELY, 7.5 MINUTE SERIES



QUADRANGLE LOCATION

SITE NO: 932027
LOCATION: TOWN OF NIAGARA
NIAGARA COUNTY

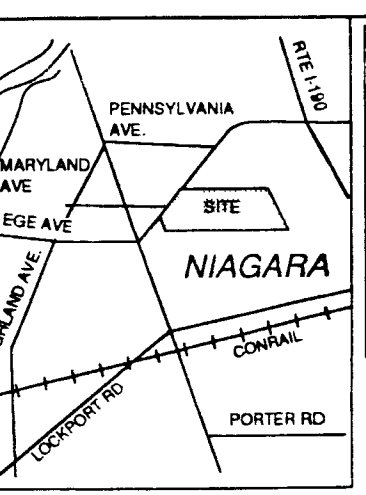
SCALE IN FEET

0 2000 4000

FIGURE 1-1
SITE LOCATION MAP
WITMER ROAD SITE
PRELIMINARY SITE ASSESSMENT
NEW YORK STATE DEC

ABB Environmental Services

7081-50



LOCATION MAP
N.T.S

LEGEND

- SD/SW-104-92 597.4 — Surface Water/Sediment Sample with Elevation in Feet
- LT-101-92 596.3 — Leachate Collection Sample with Elevation in Feet
- WT-101-92 623.7 — Waste Pile Sample with Elevation in Feet
- MW-1 — Monitoring Well
- SW-6 — SLC Surface Water Sampling Locations
- Power Pole
- Property Line
- Chain Link Fence or Gate
- Drainage Ditch with Flow Direction
- Approximate Location of Metal Scraps and Empty Drums

Notes:

1. All locations are based on New York State Plane Coordinate Sy tem West Zone
2. All property line and right of way information determined by curr nt tax map information only
3. All elevations shown are based on an assumed elevation of 61C feet where contour 610' crosses Witmer Road near the site.
4. Abbreviations
   N/F = Now or Formerly
5. Monitoring wells denoted with "A" are shallow wells, the remaining wells are deep

SD/SW-105-92 601.4 — Wetland

N/F NIAGARA MOHAWK POWER CORP.

Approx Location Overhead Transmission Lines

Street Boundary

Street Boundary

MW-3A

MW-3

MW-3R

MW-4A

MW-4

Approx. Limits of Landfill (Airco)

NIAGARA MOHAWK POWER CORP./ PASNY PROPERTY

WT-107-92 615.0

WT-108-92 615.2

WT-105-92 606.4

WT-106-92 618.7

LT-103-92 628.0

Leachate Collection System

LT-102-92 628.1

Approx. Top of Landfill

Approx Limits of Landfill (SKW)

N/F SKW ALLOYS INC.

N/F AIRCO PROPERTIES INC.

WT-102-92 620.4

WT-101-92 623.7

Site BM 1
RRS in PP
NM73 NYT10
Elev.=595.11

Storage Bldg.

Drive

Guard House

Abandoned Storage Bldg.

Dirt Drive

Stock Piles

Leachate Collection Tank
LT-101-92
596.3

MW-5R

MW-13A

MW-13

WT-103-92 617.9

SW-6

SD/SW-101-92 601.2

MW-2

MW-2A

Abandoned Storage Bldg.

MW-5A

MW-5

MW-14N

WT-104-92 594.7

N/F SKW ALLOYS INC

SD/SW-104-92 597.4

Approx. Limits of Airco Cap

SD/SW-103-92 598.1

MW-1

MW-1A

SD/SW-106-92 594.4

SD/SW-102-92 593.3

Ponded Water

SW-7

SW-6A

Wetland

Wetland

Wetland

Site BM 2
NE corner of
East Headwall
Elev.=597.86

N/F
NIAGARA MOHAWK
POWER CORP.

Scale in Feet
200 400

Source:
tate Department of Environmental Conservation Map entitled
Standby Contract at SKW Site, No 2, Niagara, N.Y.",
r E C Jordan., Portland, Maine, Surveyed by Om P. Popli,
hester, N Y, Dated 12/92 Revised 1/18/93

WELL ELEVATION TABLE (in feet)

WELL	GRND.	CASE	RISER
MW-1	600.1	604.05	603.98
MW-1A	598.9	604.58	604.48
MW-4	609.6	611.67	611.53
MW-4A	609 2	611.63	611.48
MW-14N	596.5	599 07	598 25
MW-5	596.3	599.04	598.86
MW-5A	596.0	598.45	598.31
MW-12A	592.0	594.73	594.68
MW-12	592.0	594.65	594.34

FIGURE 1-2
VANADIUM CORPORATION SITE
SITE PLAN AND SAMPLING LOCATIONS
PRELIMINARY SITE ASSESSMENT
NEW YORK STATE DEC

ABB Environmental Services

The purpose of the Task 3 investigation was to conduct environmental sampling and analysis to develop the data necessary to reclassify the site. Task 3 sampling locations are shown on Figure 1-2. Property ownership boundaries are also shown on Figure 1-2 and discussed in Subsection 3.2. The field investigation activities were conducted utilizing existing monitoring wells at the site. The Task 3 activities included:

- Collection of eight waste pile samples from the exposed waste piles on properties owned by SKW, Airco Properties, Inc. (Airco), and Niagara Mohawk Power Corporation (Niagara Mohawk)/Power Authority for the State of New York (PASNY) to confirm or deny on-site hazardous waste disposal.

- Collection of three landfill leachate samples from the SKW landfill leachate collection system to confirm or deny on-site hazardous waste disposal. The landfill leachate analytical results were compared to groundwater analytical results to establish whether a correlation between elevated levels of contaminants exists.

- Collection of six surface water and sediment samples from surface water bodies and intermittent drainage ditches on the site. These data were evaluated against New York State Class C surface water quality standards as directed by NYSDEC Region 9, and guidance values, set forth under 6 NYCRR Parts 700-705 (NYSDEC, 1991), to establish whether there has been a contravention of standards.

- Collection of eight groundwater/leachate samples from existing monitoring wells at the site to confirm or deny hazardous waste disposal. These data were evaluated against New York State Groundwater Quality Class GA standards, set forth under 6 NYCRR Parts 700-705 (NYSDEC, 1991), to establish whether there has been a contravention of standards.

Task 3 activities are reported in two volumes. Volume I presents the project purpose, description of the Task 3 scope of work, the results of the Task 3 activities, and a final recommendation for reclassifying the site. Included in Volume I are Appendix A, revised Registry Site Classification Decision Form, and Appendix B, revised Site Inspection Form (U.S. Environmental Protection Agency Form 2070-13). Volume II, Supporting Documentation, contains field data records, laboratory results, and the Survey Control Report.

2.0 SCOPE OF WORK

2.1 SITE RECONNAISSANCE

On April 8, 1992, ABB-ES personnel made a site reconnaissance of the Vanadium site with representatives from NYSDEC (Mr. Yavuz Erk, Ms. Mary MacIntosh, Ms. Cheryl Webster), Niagara County Health Department (Mr. Paul Dicky), SKW (Mr. Ron Stipp, Mr. Russ Trivedi), Airco (Carbon/Graphite Group) (Ms. Suzette Kosikowski), and Om P. Popli Associates, Inc. (surveying subcontractor). The representative from Om P. Popli Associates, Inc. (Mr. Kevin Ryan) approved site access for surveying activities. The proposed exploration activities were recorded on a draft site plan. In addition to observing the extent of the exposed waste piles, several empty 55-gallon containers, pieces of scrap metal, and remains of baghouse equipment were observed on and around the waste piles on the Airco property. The previous contents of the 55-gallon containers is unknown.

Proposed sampling locations and the sampling rationale were discussed with NYSDEC and the Niagara County Health Department. The following changes in scope were identified during the site reconnaissance:

- In the Project Management Work Plan (E.C. Jordan Co., 1991a), it was assumed that the site consisted of the SKW and Airco properties and did not include the abutting Niagara Mohawk/PASNY property. During the site reconnaissance, both NYSDEC and Niagara County Health Department representatives recommended that the site be expanded to include the Niagara Mohawk/PASNY property and that sampling also be conducted on

this property during Task 3. The original property limits used for disposal purposes by Vanadium included not only the current SKW and Airco properties, but also included the land owned by Niagara Mohawk and PASNY. The Niagara Mohawk/PASNY property is not secure from public access and the potential for public exposure exists.

- NYSDEC requested that the landfill leachate sampling on the SKW property be expanded to include samples from the standpipes located at the top of the landfill cells.

- NYSDEC also requested that surface water/sediment pairs be obtained along the intermittent drainage ditch and at the area of ponded water.

In an April 27, 1992 telephone conversation between ABB-ES and Mr. Sri Maddineni of the NYSDEC Albany office, the investigation of the Niagara Mohawk/PASNY property and additional sampling and analysis were discussed. Mr. Maddineni agreed that the investigation of the Niagara Mohawk/PASNY property was necessary. In addition, because of the nature of the waste pile sample matrix, NYSDEC requested that ignitability and reactivity analyses be eliminated from the waste pile sample analyses for the site as a whole.

2.2 FILE REVIEW

ABB-ES personnel conducted a Task 1, Data Records Search and Assessment at the site in 1990 (E.C. Jordan Co., 1991b). During preparation of this report ABB-ES reviewed additional file information provided by NYSDEC in the form of a letter from Airco Alloys to the Interagency Task Force on Hazardous Wastes, dated November 7, 1978, concerning past disposal practices of the company (Appendix C). Information from this letter has been incorporated into this report.

2.3 GEOPHYSICAL SURVEY

ABB-ES did not conduct a geophysical survey at the Vanadium site during the Task 3 investigation.

2.4 ENVIRONMENTAL SAMPLING

The following subsections describe the Task 3 sampling activities completed at the site. ABB-ES conducted the field investigations in accordance with the scope of work set forth in the Site Work Plan (E.C. Jordan Co., 1992c) and specifications presented in the Program Quality Assurance Project Plan (QAPP) (E.C. Jordan Co., 1992a) and the site-specific QAPP (E.C. Jordan Co., 1992c). The health and safety procedures for all on-site activities were in conformance with the Program Health and Safety Plan (HASP) (E.C. Jordan Co., 1992b) and the site-specific HASP (E.C. Jordan Co., 1992c). Task 3 environmental sampling was conducted using Level C dermal personal protective equipment.

Analytical data developed by ABB-ES during the Task 3 investigation meet the data quality objectives set forth in the site-specific QAPP (E.C. Jordan Co., 1992c) and are suitable for site reclassification. A complete list of laboratory analytical data is presented in Volume II. Data validation and usability documentation are included therein.

2.4.1 Exposed Waste Pile Sampling

Eight composite samples (designated WT-101 through WT-108) and one duplicate sample (designated WT-106 D) were collected from the exposed waste piles (see Figure 1-2). The samples were collected as follows: three samples on the Airco landfill property; one sample on the SKW property; and four samples on the Niagara Mohawk/PASNY property as specified by NYSDEC representatives in the field. The latter group of four samples was intended to include two samples from the Niagara Mohawk property and two from the PASNY property. However, property boundaries were unclear in the field; therefore, sampling locations were selected using available information with the help and approval of NYSDEC. The two samples presumed to be on the PASNY property (WT-107 and WT-108) were split with PASNY's laboratory coordinator, Ms. Paula Furmusa, of Upstate Laboratories in Rochester, New York.

All waste pile samples were collected no deeper than 12 inches below ground surface (bgs). The intent of the sampling protocol was to collect samples below any weathering layer, however, because the ground material was very hard, the hand-dug excavations could only be advanced to 12 inches bgs. It is not known whether the collected samples represent unweathered (unleached) material.

Samples were collected using a shovel and rock hammer. Loose material was collected using a stainless steel spoon, and samples were homogenized in a stainless steel bucket. Several of the samples were broken up using a rock hammer. The following table describes the waste pile samples as recorded on the Surface Soil Sample Data Records sheets (see Volume II).

Sample Location	Description
WT-101	black to dark gray ash with fine sand
WT-102	light green to brown ash with coarse sand
WT-103	light gray to black ash
WT-104	white sand on surface with brown/black sand underneath contained wood chips
WT-105	fine to medium sand black with silver metallic flakes
WT-106	white to gray sand
WT-107	gray gravelly slag
WT-108	gray sand

Samples were collected and documented following procedures in the Program QAPP. Samples were screened for the presence of volatile organic compounds (VOCs) in the field with a Photovac TIP photoionization detector (PID). The PID reading at sampling location WT-104 was recorded as 2 to 4 parts per million above background. All other PID readings were at background levels. Sampling

personnel recorded screening results and sample descriptions on Surface Soil Sampling Data Records (see Volume II).

Waste pile samples were submitted to NYTEST Environmental, Inc. (NYTEST) for analysis of Target Compound List (TCL) VOCs, TCL semivolatile organic compounds (SVOCs), TCL inorganics, hexavalent chromium, and characteristics of hazardous wastes including EP Toxicity (metals only) and corrosivity. A complete set of validated analytical data tables are included in Volume II. The results are presented and discussed in Subsection 3.4.1.

2.4.2 SKW Landfill Leachate Sampling

ABB-ES personnel collected three leachate samples (designated LT-101 through LT-103) from the SKW landfill leachate collection system. The samples were collected at the two most northern and southern landfill standpipes and at the collection system tank (see Figure 1-2). The leachate samples were collected using a Teflon bailer to fill sample bottles. Samples were collected and documented following procedures set forth in the Program QAPP. Samples were screened for the presence of VOCs with a PID. No readings above background levels were detected. Leachate samples were measured in the field, using a Yellow Springs Instrument (YSI) Model 3500 water quality monitor, for temperature, pH, oxidation-reduction potential (Eh), specific conductivity, and dissolved oxygen (DO) at the time of sampling. ABB-ES personnel recorded screening results and sample descriptions on Surface Water and Sediment Field Sampling Data Records (see Volume II).

Leachate samples were submitted to NYTEST and analyzed for TCL VOCs, TCL SVOCs, TCL inorganics, hexavalent chromium, and characteristics of hazardous wastes including corrosivity and reactivity. A complete set of validated analytical data tables are included in Volume II. The results are presented and discussed in Subsection 3.4.2.

2.4.3 Surface Water and Sediment Sampling

ABB-ES personnel collected six sets of paired surface water and sediment samples and one duplicate pair (designated SW/SD-101 through SW/SD-106 and SW/SD-102 D, respectively) at the site (see Figure 1-2). Surface water was collected using a pre-cleaned 1-quart plastic sample bottle to fill the other sample bottles or by filling the containers directly. Sediment was sampled using either a stainless steel hand auger or stainless steel spoon and bucket. The sediment sample was collected after the surface water sample at each location.

Sample SW/SD-101 was collected in the intermittent drainage ditch located on the east side of the site at the location where the water enters the Airco landfill property. Sample SW/SD-102 and the duplicate sample SW/SD-102 D were collected at the ponded water located at the southern edge of the SKW property. Sample SW/SD-103 was collected in a wetland area east of the Airco property. Sample SW/SD-104 was collected at the southwest corner of the Airco landfill in the intermittent drainage ditch that flows around the landfill area. Sample SW/SD-105 was collected in the drainage ditch presumably on the PASNY property. Sample SW/SD-106 was added by NYSDEC Region 9 during the Task 3 sampling activities and was collected at the outflow of an area of standing water at the southern edge of the SKW property where it discharges to an adjacent

wetland. This sampling location was chosen by Mr. Mike Hinton of NYSDEC Region 9.

All samples were collected and documented in accordance with procedures described in the Program QAPP. The sediment samples were screened with a PID during sampling. No readings above background were detected. Surface water was measured for temperature, pH, specific conductivity, and DO in the field at the time of sampling, using a YSI Model 3500 water quality monitor. Sampling personnel recorded screening results, field measurements, and sampling descriptions on Surface Water/Sediment Field Sampling Data Records (see Volume II).

Surface water samples were submitted to NYTEST and analyzed for TCL VOCs, TCL SVOCs, TCL inorganics, and hexavalent chromium. Sediment samples were submitted to NYTEST and analyzed for TCL VOCs, TCL SVOCs, TCL inorganics, hexavalent chromium, and hazardous waste characteristics including EP Toxicity (metals only) and corrosivity. A complete set of validated analytical data tables are included in Volume II. The results of these analyses are presented and discussed in Subsection 3.4.3.

2.4.4 Groundwater/Leachate Sampling

Eight groundwater/leachate samples from existing monitoring wells (MW-14N, MW-12, MW-12A, MW-1, MW-1A, MW-5, MW-5A, and MW-4A) were collected (see Figure 1-2). None of the wells are considered representative of upgradient or background groundwater conditions.

All samples were collected and documented in accordance with procedures described in the Program QAPP. The breathing zone around the monitoring well was monitored with a PID during sampling. No readings above background were detected. Samples were measured for temperature, pH, specific conductivity, DO, Eh, and turbidity at the time of collection using a YSI Model 3500 water quality monitor. Sampling personnel recorded screening results, field measurements, and sampling descriptions on Groundwater Field Sampling Data Records (see Volume II).

The groundwater/leachate samples were submitted to NYTEST and analyzed for TCL VOCs, TCL SVOCs, TCL inorganics, and hexavalent chromium. A complete set of validated analytical tables are included in Volume II. The results of these analyses are presented and discussed in Subsection 3.4.4.

3.0 SITE ASSESSMENT

3.1 SITE HISTORY

The Vanadium site is located off Witmer Road in the Town of Niagara, Niagara County, New York (see Figures 1-1 and 1-2). From 1920 to 1964, the site was owned by U.S Vanadium Corporation. The extent of land owned by Vanadium is not known. Vanadium used portions of the property to dispose of approximately 594,000 tons of wood, brick, ash, lime slag (calcium hydroxide), ferromanganese slag, ferrochromium silicon slag, and ferrochromium silicon dust. In 1964, Airco purchased 62 acres of the Vanadium property. Although Airco owned the site, an affiliated company, Airco Carbon (now called Carbon/Graphite Group), operated the site and disposed of wastes similar to those disposed by Vanadium. In 1979, SKW bought the western 37 acres of Airco's 62-acre parcel while Airco retained ownership of the eastern 25 acres. Property owned by the Niagara Mohawk Power Corporation and PASNY to the east and north of these 62 acres also contains waste piles deposited by Vanadium. These waste piles reportedly contain calcium hydroxide, ferromanganese slag, ferrochromium slag, and ferrochromium dust (E.C. Jordan Co., 1991b). Rusted and crushed 55-gallon containers and scrap metal were also observed on and around waste piles on both the Airco and Niagara Mohawk/PASNY property (E.C. Jordan Co., 1992c).

Interagency Task Force records show that approximately 5,000 tons per year of baghouse dust containing ferrochromium silicon dust were disposed of by Airco Alloys at the Vanadium site from 1971; when the baghouse was installed; to shortly after 1984. Over the 14 year period, it is estimated that approximately 70,000 tons of this waste was generated and disposed of on site. This waste was

disposed of on the SKW and Airco properties and potentially on portions of the Niagara Mohawk and PASNY properties. Interagency Task Force records show that in 1984 SKW discontinued generating ferrochromium silicon wastes (Appendix C), (NYSDEC, 1993).

The areal extent of contamination at the Vanadium site has not been defined. Contamination investigations before this PSA investigation occurred only on the Airco and SKW properties. For the purposes of this PSA, the site is considered to encompass the 62 acres owned by Airco and SKW and the surrounding Niagara Mohawk/PASNY property.

Both SKW and Airco constructed landfills on their respective properties.

SKW Alloys Landfill. In 1980, SKW received a NYSDEC Part 360 permit to operate a solid waste disposal facility on its property. This facility consisted of two landfill cells and was designed for the disposal of ferrochromium silicon baghouse dust and ferrosilicon baghouse dust wastes. The landfill is no longer in use and was closed, graded, and seeded in accordance with NYSDEC regulations before October 1992.

The production of ferrochromium alloy materials at the SKW plant was discontinued in 1981 or 1982 due to economic factors. Reportedly, all ferrochromium dust materials produced at the SKW plant were disposed of in Cell No. 1, and no ferrochromium silicon dusts were disposed of in Cell No. 2. According to the consulting engineer for SKW, Cell No. 1 has a 5-foot clay liner and a leachate collection system. Cell No. 2 has a 2-foot clay liner and leachate collection system and has been used to dispose of ferrosilicon and silicon metal

baghouse dust. Leachate from both cells is collected and used to slurry the baghouse dusts (Snyder, 1990).

Airco Properties, Inc. Landfill. The Airco landfill, operated by the Carbon/Graphite Group, is unlined and has no leachate collection system. This landfill was built on the southern extent of a large waste pile or landfill originated by Vanadium. The Carbon/Graphite Group disposed of fire bricks, concrete cinder blocks, coke, and carbon fines in the landfill (Kosikowski, 1990). The materials landfilled by the Carbon/Graphite Group were covered with clay and loam, and seeded. No waste disposal currently occurs on the Airco property.

Both SKW and Airco installed numerous monitoring wells at the site. An ongoing quarterly sampling program, including samples from several of these wells, has provided some groundwater data. Quarterly sampling locations on the SKW property include monitoring wells MW-5R, MW-3R, MW-12, and MW-14N and surface water sampling locations SW-6A and SW-7. Quarterly sampling locations on the Airco property include monitoring wells MW-1, MW-1A, MW-2, MW-2A, MW-4, MW-4A, MW-13, and MW-13A and surface water sampling locations SW-6 and SW-6A (see Figure 1-2). The samples are analyzed for total dissolved solids, chemical oxygen demand, total organic carbon, barium, chromium (total and hexavalent), iron, manganese, silicon, zinc, specific conductivity, and pH. In addition, SKW samples for baseline parameters in accordance with its 6 NYCRR Part 360 permit.

3.2 SITE DESCRIPTION

The Vanadium site consists of a 25-acre parcel owned by Airco, a 37-acre parcel owned by SKW, and surrounding property to the north and east owned by the Niagara Mohawk Power Corporation and PASNY (see Figure 1-2). The actual limits of waste disposal have not been defined, thus, the property boundaries and associated acreage may not reflect actual site boundaries. The southwest corner of the SKW property is relatively flat. The remaining portions, consisting of the SKW and Airco landfills and the exposed waste piles on the Airco and Niagara Mohawk/PASNY properties, is fairly rough, irregular terrain.

Surface drainage generally flows south toward a wetland area. Surface water in the vicinity of the Airco Property is controlled by two drainage ditches. Most of the site, consisting of exposed waste piles, is devoid of vegetation.

The site is bordered on the north by a parking area, on the south by a wetland area and property owned by Union Carbide, and to the west by Witmer Road and several automobile junk yards. The Niagara Mohawk property, immediately east, south, and north of the SKW and Airco properties, is considered to be part of the site disposal area previously used by Vanadium. Property ownership east of the Airco parcel is unclear. A tax map provided by NYSDEC Region 9 indicates ownership by both Niagara Mohawk and PASNY. These properties are bordered to the east by Interstate 190. Single family homes are located two-tenths of a mile north of the site.

Site Geology and Hydrogeology. The soils on the Vanadium site consist of Odessa silty clay loam. This is a poorly drained, reddish soil. The underlying bedrock is Lockport Dolomite (Soil Conservation Service, 1972).

Specific information regarding soil type and water tables is available from Earth Dimensions, Inc.'s soil boring logs. Bedrock is encountered at depths ranging from 11 to 24 feet bgs. Glacial till with extreme ranges in texture (silt to gravel and boulders) overlies the bedrock. This till material ranges in thickness from 0.6 to 7 feet. Clays and silty clays, which range in thickness from 2 to 12.5 feet, overlie the till material. From 0 to 9 feet, fill materials consist of slag, cinders, dust, and fly ash (Earth Investigation Ltd., 1988). The permeability of the unsaturated zone is expected to be $1x10^{-2}$ to $1x10^{-4}$ centimeters per second (Johnston, 1964; and Earth Investigations Ltd., 1988).

Groundwater is located at approximately 20 feet bgs, in glacial till soils, with an expected flow direction to the south or southwest (SLC, 1987). A perched water table exists above the silty clays during most of the year at depths of approximately 3 feet bgs.

An intermittent drainage ditch enters the site on the eastern border of the Airco property and flows generally westward along the southern border of the site. The drainage ditch generally flows in the spring due to runoff and is dry in the summer months (see Figure 1-2). The drainage ditch contributes to Bloody Run Creek which eventually flows into the Niagara River located 1.5-miles west of the site. Bloody Run Creek is classified a Class C surface water body by NYSDEC Region 9.

Most residents in the vicinity of the Vanadium site are served by a public water system that obtains drinking water from the Niagara River. Three private wells are located on Delaware Avenue, 1,200 feet northwest of the site.

3.3 PREVIOUS INVESTIGATIONS

Previous investigations of the Vanadium site include EP Toxicity tests by Radian Corporation in 1984 and Advanced Environmental Services, Inc. (AES) in 1987, and groundwater sampling by SLC from 1979 to 1987. A PSA Task 1 - Data Records Search and Assessment was performed by E.C. Jordan Co. in 1989. Previous investigations are summarized and described below.

In 1984, the Radian Corporation analyzed samples of ferrosilicon emission dust, ferrochromium silicon dust, and ferrochromium silicon slag from the SKW plant. Ferrochromium silicon dust is a K090 listed hazardous waste as defined by 6 NYCRR Part 371.4 (c). Radian Corporation reported that the ferrosilicon dust sample failed the EP Toxicity analysis for selenium; however, the results of this analysis are inconsistent with analysis for total selenium. Selenium was detected in the EP Toxicity leachate at 2 milligrams per liter (mg/L) whereas the total selenium in the waste material was detected at 0.64 milligrams per kilograms (mg/kg). If the total selenium result of 0.64 mg/kg were correct, the EP Toxicity results could not exceed the maximum permissible concentration. However, an American Society for Testing and Materials leaching procedure was also performed on the sample, resulting in high selenium concentrations (5.3 mg/L). These conflicting results may be due to a nonhomogeneous sample matrix. The regulatory limit for selenium is 1 mg/L. Radian Corporation also reported that a sample of ferrochromium silicon dust failed EP Toxicity for chromium.

Chromium was detected at a concentration of 14 mg/L, with total chromium detected at 1,800 mg/kg. The regulatory limit for chromium is 5 mg/L. A ferrochromium silicon slag sample collected by Radian did not fail the EP Toxicity test. The concentration of hexavalent chromium was below the method detection limit in all three analyses (Radian Corporation, 1984). Sometime after this testing was completed in 1984, SKW discontinued generating ferrochromium silicon wastes (NYSDEC, 1993).

In November 1987, AES conducted an EP Toxicity analysis for metals, in particular chromium and selenium, on dry dust from silicon metal and ferrosilicon operations at the SKW plant. Analytical results were negative for both chromium and selenium. Concentrations of EP Toxicity metals and organic compounds were below quantifiable limits or regulatory limits. In the EP Toxicity leachate analysis selenium was detected in the extract at 0.374 mg/L in the silicon metal dust sample and at 0.060 mg/L in the ferrosilicon dust sample. These levels are significantly lower than the 2 mg/L detected in the 1984 EP Toxicity test of ferrosilicon dust. These samples, collected in 1987, most likely did not fail EP Toxicity for chromium and selenium because the wastes containing ferrochromium silicon were not generated after 1984. The 1984 Radian Corporation analytical results indicating the presence of chromium and selenium in the waste are considered valid because they were collected while the ferrochromium silicon wastes were being generated from the manufacturing process and these wastes were disposed of at the Vanadium site (NYSDEC, 1993).

Interagency Task Force records show that approximately 5,000 tons per year of baghouse dust containing ferrochromium silicon dust were disposed of by Airco Alloys at the Vanadium site from 1971 (when the baghouse was installed) to

shortly after 1984. Over the 14 year period, it is estimated that approximately 70,000 tons of this waste was generated and disposed of on site. As defined by 6 NYCRR 371.4(c), emission control dust or sludge from ferrochromium silicon production is a K090 listed hazardous waste. This hazardous waste was disposed of on the SKW and Airco properties and on portions of the Niagara Mohawk and PASNY properties (Appendix C), (NYSDEC, 1993).

In December 1987, the NYSDEC Region 9 office sent SKW a notice of violation of Article 12 of the Navigation Law of New York; Article 17 of the Environmental Conservation Law, and 40 CFR Chapter 1, Part 761. These violations were for failure to report a 790-gallon polychlorinated biphenyl oil spill on the SKW landfill site. No fines were levied against the company because of the voluntary cleanup actions performed by SKW. An inspection of the site by NYSDEC confirmed that the cleanup was performed satisfactorily (Hinton, 1987).

Between 1979 and 1987, numerous monitoring wells were installed around the SKW and Airco landfills by Earth Dimensions, Inc. Fifteen wells, both deep and shallow ("A" denotes shallow wells), were sampled and analyzed by SLC. In addition, three surface water locations were sampled and analyzed (see Figure 1-2). The following discussion of the SLC results are separated into two categories: shallow wells and surface water, and deep wells. Monitoring well installation records indicate the wells were installed originally using carbon steel well screens and risers. The 1989 SKW Landfill Annual Report indicates that the carbon steel wells were replaced with polyvinyl chloride wells.

Shallow Wells and Surface Water. Field measurements of the pH of the surface water and groundwater/leachate collected from the shallow monitoring wells

exceeded 12.5. This indicates the presence of a D002 corrosive characteristic hazardous waste source. The results are summarized as follows:

Sample Location	Date	pH	Characteristic Hazardous Waste pH
MW-2A (shallow)	1/23/86 4/2/86 8/4/86 10/2/86 7/23/87 1/12/88 1/19/89 4/19/89 7/20/89 10/4/89 1/11/90 4/18/90	12.61 12.7 12.70 12.50 12.50 12.65 12.95 12.97 13.29 12.60 12.87 12.68	pH ≤ 2.0 or pH ≥ 12.5
MW-4A (shallow)	1/23/86 4/2/86 8/4/86 10/2/86 7/23/87 1/19/89 4/19/89 7/20/89 10/4/89 1/11/90 4/19/90	12.70 12.8 12.70 12.55 12.55 12.83 12.95 12.58 12.63 12.80 12.78	pH ≤ 2.0 or pH ≥ 12.5
SW-6 (surface water)	4/2/86	12.5	pH ≤ 2.0 or pH ≥ 12.5
SW-6A (surface water)	1/19/89 1/11/90	12.69 12.5	pH ≤ 2.0 or pH ≥ 12.5
SW-7 (surface water)	8/4/86	12.65	pH ≤ 2.0 or pH ≥ 12.5

Monitoring data for shallow wells also shows a contravention of New York State Class GA standards for iron, manganese, zinc, barium, chromium, and hexavalent chromium. There are no Class GA promulgated standards for pH. According to standards set forth in 6 NYCRR Parts 700-705, a pH less than 6.5 or more than 8.5 is considered a contravention of standards. The pH in the groundwater ranged from 7.32 to 13.29, which indicates a contravention of standards. Surface water analyses indicate wide variations in concentrations of total chromium, hexavalent chromium, iron, silicon, barium, and zinc. The pH in the surface water was compared to the New York State Surface Water Quality Standards Class C range of pH $\leq$ 6.5 or pH $\geq$ 8.5. The surface water pH ranged from 7.69 to 12.69, indicating a contravention of standards.

Inorganics detected in surface water in exceedance of the Class C standards include hexavalent chromium, iron, and zinc. Insufficient data were available to establish whether total chromium exceeded Class C standards.

Deep Wells. The monitoring program for the deep wells (i.e., wells installed into the glacial till overlying bedrock) indicated an exceedance of pH of 12.5, indicating the presence of a corrosive characteristic hazardous waste in one well. Measurement of pH in monitoring well MW-2 was 12.63. Deep monitoring wells show a contravention of New York State Groundwater Quality Class GA standards for iron, barium, manganese, chromium, hexavalent chromium, zinc, and pH.

The exceedances of Class GA standards found in the deep wells are summarized as follows:

Compound	Concentration (mg/L)	New York State Groundwater Class GA Standard (mg/L)
iron	0.02 - 48.5	0.3
barium	0.01 - 3.1	1.0
manganese	0.01 - 12.0	0.3
chromium	< 0.005 - 0.63	0.05
zinc	0.003 - 0.99	0.3
hexavalent chromium	< 0.005 - 0.084	0.05
pH	6.43 - 12.63	6.5 - 8.5[1]

[1] 6 NYCRR Part 700-705

Additional Investigations. A 1989 SKW Landfill Annual Report submitted to NYSDEC included data collected and analyzed from the deep wells MW-3R, MW-5R, MW-12, MW-14N, and from surface water sampling points SW-6A and SW-7. Results are discussed below. The wells are used to monitor parameters identified in the 6 NYCRR Part 360 permit for the SKW landfill. SW-6A is a sampling point for surface water entering the SKW property and SW-7 is a sampling point for surface water leaving the property (see Figure 1-2).

Hexavalent chromium was not detected in wells MW-3R, MW-5R, MW-12, or MW-14N in 1989; however, hexavalent chromium was detected in surface water samples in concentrations ranging from 0.20 to 0.88 mg/L with high concentrations occurring at the downstream sampling point (SW-7). Trichloroethene was detected in deep well MW-14N at 47.1 micrograms per liter (μg/L), in exceedance of the New York State Class GA water quality standard of 5 μg/L for this compound.

Exposed slag piles potentially containing ferrochrome dusts, calcium hydroxide, and ferromanganese material exist on right-of-ways owned by the Niagara Mohawk Power Corporation and PASNY, and on the Airco property. No sampling data exist for these waste piles. They are uncovered, unlined, and have no leachate collection systems. The Task 1 report (E.C. Jordan Co., 1991b) states that exposure to airborne dust generated from exposed waste piles is a public health concern since this dust may contain chromium.

3.4 CONTAMINATION ASSESSMENT

The following subsections present the results of the sampling and analysis conducted at the Vanadium site during the Task 3 investigation. Data evaluation is limited to the project purpose of establishing whether hazardous waste was disposed of on the site and whether waste material poses a potentially significant threat to public health or the environment. For the purposes of this investigation hazardous waste was evaluated based on results of characteristics testing of EP Toxicity for all samples, reactivity testing for the leachate samples, and corrosivity testing for the sediment, waste and leachate samples. To evaluate the potential significant threat, surface water results were compared to Class C surface water standards as directed by NYSDEC Region 9. Groundwater results were compared to New York State Class GA Groundwater Quality standards. Because no standards are promulgated for sediment, the only evaluation of data for this media is comparison of inorganic data with background soil concentration ranges for inorganics in soils of New York State and the eastern United States (Table 3-1).

TABLE 3–1
RANGES OF BACKGROUND INORGANIC CONCENTRATIONS IN SOIL

U.S. VANADIUM CORPORATION SITE
NIAGARA, NEW YORK

COMPOUND	EASTERN U.S.[1] (mg/kg)	NEW YORK REGION[2] (mg/kg)
Aluminum	7,000 – > 100,000	1,000 – 25,000
Antimony	a	a
Arsenic	<0.1 – 73	3 – 12
Barium	10 – 1,500	15 – 600
Beryllium	<1 – 7	0 – 1.75
Cadmium	a	0.01 – 2
Calcium	100 – 280,000	130 – 35,000
Chromium	1 – 1,000	1.5 – 40
Cobalt	<0.3 – 70	2.5 – 60
Copper	<1 – 700	<1 – 15
Iron	100 – > 100,000	17,500 – 25,000
Lead	< 10 – 300	10 – 37
Magnesium	50 – 50,000	1,700 – 6,000
Manganese	<2 – 7,000	50 – 5,000
Mercury	0.01 – 3.4	0.042 – 0.066
Nickel	<5 – 700	0.5 – 25
Potassium	50 – 37,000	8,500 – 43,000
Selenium	<0.1 – 3.9	<0.1 – 0.125
Silver	a	a
Sodium	<500 – 50,000	6,000 – 8,000
Vanadium	<7 – 300	25 – 60
Zinc	<5 – 2,900	37 – 60

NOTES:

mg/kg = milligrams per kilogram

a = standard not developed

1 = Concentrations obtained from "Background Concentrations of 20 Elements in Soils with Special Regard for New York State". (no date) Paper prepared by E. Carol McGovern, NYSDEC Wildlife Resources Center.

2 = Shacklette, M.T. and J.G. Boerngen, 1984. "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States"; USGS Professional Paper 1270.

3.4.1 Exposed Waste Pile Sampling Analytical Results

Eight waste samples (WT-101 to WT-108) and one duplicate (WT-108D) were collected and analyzed for TCL VOCs, TCL SVOCs, TCL inorganics, hexavalent chromium, hazardous waste characteristic corrosivity, and EP Toxicity for metals only. Results of these analyses are summarized in Table 3-2. No TCL VOCs and 25 TCL SVOCs were detected in the waste samples. WT-102 was the only sample that contained TCL SVOCs above the detection limit.

A total of 22 TCL inorganics were detected. Because there are no promulgated standards for inorganics, the data was compared to New York State and/or eastern United States background concentration ranges (see Table 3-1). The inorganics that exceeded these ranges are arsenic, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, selenium, vanadium, and zinc. Hexavalent chromium was detected in all waste pile samples. Concentrations of hexavalent chromium detected in WT-106, WT-106D, and WT-108 exceeded the background inorganic concentration range for total chromium in the New York region.

Samples were also analyzed for corrosivity and EP Toxicity (metals only). Values for corrosivity did not exceed the regulatory limits of pH ≤ 2 or ≥ 12.5. Although EP Toxicity extracts contained detectable levels of arsenic, barium, chromium, lead, and silver, the concentrations did not exceed regulatory limits for the definition of a characteristic hazardous waste.

TABLE 3-2
EXPOSED WASTE PILE SAMPLING ANALYTICAL DATA

U.S. VANADIUM CORPORATION SITE
NIAGARA, NEW YORK

COMPOUND	CRQL/ CRDL	WT-101	WT-102	WT-103	WT-104	WT-105	WT-106	WT-106DUP	WT-107	WT-108
TCL Volatile Organic Compounds (µg/kg)										
None detected at concentrations above detection limits										
TCL Semivolatile Organic Compounds (µg/kg)										
2,4-Dimethylphenol	330	–	–	–	22 JJ	–	–	–	–	–
2-Methylnaphthalene	330	–	140 JJ	–	300 JJ	8 JJ	–	5 JJ	–	–
2-Methylphenol	330	–	–	–	18 JJ	–	–	–	–	–
Acenaphthene	330	13 JJ	160 JJ	18 JJ	–	10 JJ	–	9 JJ	9 JJ	–
Acenaphthylene	330	–	400 JJ	–	–	–	–	–	3 JJ	–
Anthracene	330	–	1500	28 JJ	11 JJ	–	–	29 JJ	7 JJ	–
Benzo(a)Anthracene	330	110 JJ	2700	120 JJ	–	14 JJ	11 JJ	120 JJ	71 JJ	9 JJ
Benzo(a)Pyrene	330	70 JJ	1500	85 JJ	–	–	–	63 JJ	42 JJ	–
Benzo(b)Fluoranthene	330	150 JJ	1500	160 JJ	–	–	–	80 JJ	49 JJ	22 JJ
Benzo(g,h,i)perylene	330	–	240 JJ	31 JJ	–	–	–	–	–	–
Benzo(k)Fluoranthene	330	130 JJ	1300	130 JJ	–	–	–	56 JJ	42 JJ	–
Carbazole	330	10 JJ	830 JJ	15 JJ	8 JJ	–	–	15 JJ	4 JJ	–
Chrysene	330	210 JJ	3100	210 JJ	30 JJ	20 JJ	14 JJ	150 JJ	85 JJ	17 JJ
Dibenzofuran	330	–	890 JJ	9 JJ	52 JJ	4 JJ	–	8 JJ	–	–
Dibenz(a,h)Anthracene	330	–	200 JJ	–	–	–	–	–	–	–
Diethylphthalate	330	–	–	–	13 JJ	8 JJ	–	13 JJ	–	–
Di-n-butylphthalate	330	–	–	–	39 JJ	22 JJ	16 JJ	60 JJ	–	–
Di-n-octylphthalate	330	–	–	–	2 JJ	–	–	–	3 JJ	2 JJ
Fluoranthene	330	230 JJ	8400 D	260 JJ	–	–	–	–	120 JJ	27 JJ
Fluorene	330	–	980	–	–	4 JJ	–	–	–	–
Indeno(1,2,3-c,d)Pyrene	330	–	1100	110 JJ	–	–	–	–	–	–
Naphthalene	330	–	700 JJ	–	220 JJ	44 JJ	–	–	–	–
Phenanthrene	330	100 JJ	9300 D	130 JJ	–	–	–	–	54 JJ	14 JJ
Phenol	330	–	–	–	29 JJ	–	–	–	–	–
Pyrene	330	110 JJ	5400 J	160 JJ	–	–	–	–	65 JJ	10 JJ
TCL Inorganic Compounds (mg/kg)										
Aluminum	40	3180	13500	5590	254	5960	11900	16700	15000	18800
Antimony	12	17.8 []	30.6	44.6	–	22.3	38.1	60.6	23.5 J	46.1 J
Arsenic	2	1.6 []J	6.6	30.4	–	24.2	–	–	–	–
Barium	40	37.5 []	58.9	51.4 []	5.3 []	207	31.4 []	27.8 []	36.2 []J	38.9 []J
Beryllium	1	–	0.66 []	–	–	1.1 []	0.44 []	0.86 []	0.77 []	–
Cadmium	1	–	–	–	–	–	–	–	2.0 J	–
Calcium	1000	3140	107000	39100	1170	5370	162000	203000	189000	217000
Chromium	2	R	R	R	R	R	R	R	1030 J	2160 J
Cobalt	10	2.4 []J	42.6 J	38.3 J	1.3 []J	13.0 J	3.7 []J	5.0 []J	3.2 []	2.9 []

TABLE 3-2
EXPOSED WASTE PILE SAMPLING ANALYTICAL DATA

U.S. VANADIUM CORPORATION SITE
NIAGARA, NEW YORK

COMPOUND	CRQL/ CRDL	WT-101	WT-102	WT-103	WT-104	WT-105	WT-106	WT-106DUP	WT-107	WT-108
TCL Inorganic Compounds (mg/kg) Con't										
Copper	5	93.7	80.8	158	2.2 []	1640	7.7	9.6	7.7 []	7.0 []
Iron	20	17100	19800	27000	2110	30200	2390	3360	2850	3400
Lead	0.6	19.4 J	400 J	546 J	2.2 J	4.2 J	3.9 J	6.8 J	6.0 J	3.6 J
Magnesium	1000	12000	40600	16300	278 []	354 []	56600	76900	71200	99200
Manganese	3	1320	2040	3350	53.6	7190	334	354	288	465
Mercury	0.04	0.15	–	0.19	–	–	–	–	–	–
Nickel	8	38.9	1110	879	7.4 []	199	18.0	23.5	11.4 []J	8.6 []J
Potassium	1000	2270	1820	3020	–	–	–	–	386 []	–
Selenium	1	–	1.7	2.9	–	–	–	–	R	R
Silver	2	–	–	–	–	R	–	–	–	–
Sodium	1000	408 []	503 []	653 []	–	836 []	215 []	213 []	–	–
Vanadium	10	1.9 []	77.5	32.5	1.4 []	5.4 []	42.7	69.0	39.8	55.2
Zinc	4	280 J	316 J	351 J	8.2 J	19.2 J	9.7 J	12.1 J	R	R
Hexavalent Chromium (mg/kg)	0.2	3.47	16.0	15.9	0.94	0.50	51.4	66.2	4.11	91.6
Hazardous Waste Charcteristics										
Corrosivity: pH≤2 or ≥12.5[1]		7.5	8.92	9.12	6.54	6.35	10.12	10.51	9.90	8.24
EP Toxicity (mg/L)										
Arsenic: 5 mg/L[1]	0.043	–	–	0.0627	–	–	–	–	–	–
Barium: 100 mg/L[1]	0.01	0.613 J	0.509 J	0.42 J	0.532 J	0.323 J	0.459 J	0.522 J	0.412	0.564
Cadmium: 1 mg/L[1]	0.003	–	–	–	–	–	–	–	–	–
Chromium: 5 mg/L[1]	0.005	0.0934 J	0.247 J	0.35 J	–	–	0.508 J	0.887 J	0.118	0.411
Lead: 5 mg/L[1]	0.04	0.105	–	–	–	–	–	–	–	–
Mercury: 0.2 mg/L[1]	0.0002	–	–	–	–	–	–	–	–	–
Selenium: 0.4 mg/L[1]	0.051	–	–	–	–	–	–	–	–	–
Silver: 5 mg/L[1]	0.004	–	–	–	0.0094 []	–	–	–	–	–

NOTES:

CRQL = Contract Required Quantitation Limit (organics)
CRDL = Contract Required Detection Limit (inorganics)
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
[ ] = less than sample specific CRDL
[1] = Criteria of hazardous waste characteristics as set forth in 6 NYCRR Part 371, January 31, 1992.

J = estimated
JJ = estimated below sample specific CRQL
R = rejected
NA = not analyzed
– = not detected
D = diluted
DUP = duplicate

3.4.2 SKW Landfill Leachate Sampling Analytical Results

Three landfill leachate samples (designated LT-101 through LT-103) were collected from the SKW landfill leachate collection system and analyzed for TCL VOCs, TCL SVOCs, TCL inorganics, hexavalent chromium, corrosivity, and reactivity. Results of these analyses are summarized in Table 3-3.

Six TCL VOCs and one TCL SVOC were detected in the leachate samples, all at estimated concentrations. Seventeen TCL inorganics were detected. Hexavalent chromium was detected in LT-101 and LT-103, and leachate samples did not exceed any regulatory limits for corrosivity and reactivity. No promulgated New York State standards exist for leachate samples. Results of leachate analyses were compared to groundwater data to establish whether a correlation between elevated levels of contaminants exists. Several contaminants detected in leachate samples also were detected at elevated levels in the groundwater results, such as calcium, magnesium, potassium, sodium, and hexavalent chromium.

3.4.3 Surface Water and Sediment Sampling Analytical Results

Surface Water. Six surface water samples (SW-101 to SW-106) and one duplicate (SW-102 D) were collected at the site and analyzed for TCL VOCs, TCL SVOCs, TCL inorganics, and hexavalent chromium. Results including field pH measurements are summarized in Table 3-4. No TCL VOCs were detected, and all TCL SVOCs were estimated below the Contract Required Quantitation Limit except for phenol (12 μg/L in SW-104). This detection of phenol exceeds the New York State Class C Water Quality Standard.

TABLE 3–3
SKW LANDFILL LEACHATE SAMPLING ANALYTICAL DATA

U.S. VANADUIM CORPORATION SITE
NIAGARA, NEW YORK

COMPOUND	CRQL/CRDL	LT–101	LT–102	LT–103
TCL Volatile Organic Compounds (µg/L)				
2–Hexanone	10	–	–	52 J
4–Methyl–2–Pentanone	10	–	–	29 J
Acetone	10	–	–	80 J
Bromomethane	10	–	–	5 JJ
Methylene Chloride	10	3 JJ	–	–
Toluene	10	–	–	2 JJ
TCL Semivolatile Organic Compounds (µg/L)				
bis(2–Ethylhexyl)phthalate	10	–	1 JJ	–
TCL Inorganic Compounds (µg/L)				
Aluminum	200	–	–	459
Arsenic	10	30.1 J	59.3 J	24.5 J
Barium	200	29.7 []	–	41.8 []
Calcium	5000	77700	27500	52900
Chromium	10	13.7 J	5.3 []J	11.3 J
Copper	25	–	–	5.2 []
Iron	100	54.7 []	40.8 []	498
Lead	3	–	3.3 J	–
Magnesium	5000	125000	10900	20700
Manganese	15	75.0	–	22.8
Potassium	5000	268000	77700	78200
Selenium	5	R	R	R
Silver	10	–	7.6 []	–
Sodium	5000	182000	26200	33400
Thallium	10	R	R	R
Vanadium	50	–	5.2 []	–
Zinc	20	–	8.1 []	11.0 []
Hexavalent Chromium (mg/L)	0.01	0.01	–	0.12
Hazardous Waste Characteristics				
Corrosivity: pH≤2 or ≥12.5 [1]		7.76	7.82	7.45
Reactivity (Cyanide): 250 mg/L[1]	1	–	–	–
Reactivity (Sulfide): 500 mg/L[1]	1	–	–	–

NOTES:

CRQL = Contract Required Quantitation Limit (organics)

CRDL = Contract Required Detection Limit (inorganics)

µg/L = micrograms per liter

mg/L = milligrams per liter

[1] = Criteria of hazardous waste characteristics as set forth in 6 NYCRR Part 371, January 31, 1992.

R = rejected

J = estimated

JJ = estimated below sample specific CRQL

[ ] = less than sample specific CRDL

– = not detected

TABLE 3–4
SURFACE WATER SAMPLING ANALYTICAL DATA

U.S. VANADIUM CORPORATION SITE
NIAGARA, NEW YORK

COMPOUND	CRQL/ CRDL	SW–101	SW–102	SW–102DUP	SW–103	SW–104	SW–105	SW–106
TCL Volatile Organic Compounds (µg/L)								
None detected at concentrations above detection limits								
TCL Semivolatile Organic Compounds (µg/L)								
1,2,4–Trichlorobenzene	10	–	–	–	–	1 JJ	–	–
2,4–Dinitrophenol	25	–	1 JJ	1 JJ	–	–	–	–
2–Methylnaphthalene	10	–	–	–	–	1 JJ	–	–
4–Methylphenol	10	–	–	–	–	1 JJ	–	1 JJ
4–Nitrophenol	25	–	–	–	–	1 JJ	–	1 JJ
Acenaphthene	10	–	–	–	–	1 JJ	–	–
bis(2–Ethylhexyl)phthalate	10	–	–	–	–	–	1 JJ	–
Diethylphthalate	10	–	–	–	1 JJ	–	–	–
Fluoranthene	10	–	–	–	–	1 JJ	–	–
Naphthalene	10	–	–	–	–	4 JJ	–	1 JJ
Phenanthrene	10	–	–	–	–	2 JJ	–	1 JJ
Phenol	10	–	1 JJ	–	–	12	–	8 JJ
TCL Inorganic Compounds (µg/L)								
Aluminum	200	82.0 []	179 []	–	51.0 []	128 []	188 []	130 []
Barium	200	45.4 []	90.8 []	–	35.6 []	346	49.4 []	239
Cadmium	5	–	–	3.0 []	–	–	–	–
Calcium	5000	38600 J	64600 J	717 []J	69100	460000 J	33700	318000
Chromium	10	R	R	–	–	R	–	357 J
Copper	25	5.8 []	14.4 []	10.6 []	–	13.4 []	–	–
Iron	100	159	102	55.2 []	78.6 []	64.4 []	951	–
Lead	3	–	–	–	–	3.5 J	9.2 J	–
Magnesium	5000	7130	2180 []	–	17200	–	11000	–
Manganese	15	27.2 J	34.2 J	–	155	–	151	–
Potassium	5000	4850 []J	29000 J	1080 []J	6910	55300 J	5290	52200
Selenium	5	–	7.4	6.8	R	33.0	R	R
Sodium	5000	22400	39800 J	477 []J	13400	65700	8540	62200
Thallium	10	–	–	–	R	–	R	R
Vanadium	50	–	–	5.8 []	–	–	–	–
Zinc	20	8.1 []	12.4 []	–	–	–	40.4	–
Hexavalent Chromium (mg/L)	0.01	0.02	0.16	0.16	–	0.89	–	0.35
pH'		10.01	12.2	NA	7.5	12.81	7.2	12.40

NOTES:

CRQL = Contract Required Quantitation Limit (organics)
CRDL = Contract Required Detection Limit (inorganics)
µg/L = micrograms per liter
mg/L = milligrams per liter
– = not detected
' = pH measurements were taken during Task 3 field investigations. The maximum pH reading is shown, for further results see Volume 2.

[ ] = less than sample specific CRDL
J = estimated
JJ = estimated below sample specific CRQL
R = rejected
DUP = duplicate
NA = not analyzed

Sixteen TCL inorganics were detected with a contravention of standards at SW-105 (iron detected at 951 μg/L compared to a standard of 300 μg/L). Hexavalent chromium was detected and exceeds the Class C Surface Water Standard of 11 μg/L in all samples except for SW-103 and SW-105.

The concentration of hexavalent chromium detected in surface water samples collected upgradient from the area of waste disposal (i.e., SW-101, SW-103, and SW-105) was considerably lower than the concentrations detected in samples collected from, or immediately downgradient, of the areas of waste (i.e., SW-102, SW-104, and SW-106) (Figure 1-2). Hexavalent chromium was not detected in surface water samples SW-105, collected upgradient of the site, and SW-103, collected cross-gradient of the site. Hexavalent chromium was detected at 0.02 mg/L at SW-101 where the surface water enters the Airco property. Hexavalent chromium was detected at significantly higher concentrations in SW-104 and SW-106 (0.89 mg/L and 0.35 mg/L, respectively). SW-104 was collected near areas of waste on the Airco property and SW-106 was collected from the SKW property. Hexavalent chromium was also detected at 0.16 mg/L at SW-102 which was collected from the area of ponded water to the south of the SKW property. These results indicate that the hexavalent chromium contamination seen in the surface water is attributable to the wastes disposed by SKW and Airco on their respective properties.

Field pH measurements of the surface water samples ranged from 6.3 to 12.8, which exceeds the Class C standard range of pH $\geq$ 6.5 and $\leq$ 8.5. The pH readings in excess of 8.5 indicated a contravention of standards and a significant threat to public health and the environment. The pH readings in excess of 12.5 indicated that the media would have to be managed in a manner similar to a

D002 corrosive characteristic hazardous waste as defined by New York State hazardous waste regulations (6 NYCRR Part 371.3(c)(1)(i)).

The pH measured in surface water follows a similar pattern to the concentration of hexavalent chromium detected in surface water. Lower values of pH were measured in off site samples as compared to on site samples, indicating that the elevated pH is attributable to wastes disposed of on site. Surface water pH of upgradient samples SW-105 and SW-101 was 7.2 and 10.01, respectively. The pH of cross-gradient sample SW-103 was 7.5. On site and downgradient samples all had pH measurements greater than 12. Samples SW-104 and SW-106 collected from the Airco and SKW properties had pH values of 12.81 and 12.4, respectively. Downgradient sample SW-102 had only a slightly lower pH measured at 12.2. This comparison of pH measurements would indicate that the waste materials on the site are impacting the pH of surface water and a D002 corrosive characteristic waste is present on the SKW and Airco properties (NYSDEC, 1993).

Sediment. Six sediment samples (SD-101 through SD-106) and one duplicate (SD-102 D) were collected at the site. The sediment samples were analyzed for TCL VOCs, TCL SVOCs, TCL inorganics, hexavalent chromium, and hazardous waste characteristics including corrosivity and EP Toxicity for metals only. Results are summarized in Table 3-5. There were no TCL VOCs detected. A total of 29 TCL SVOCs were detected in the sediment samples. Of the 21 TCL inorganics detected, arsenic, calcium, chromium, copper, iron, lead, magnesium, mercury, nickel, and zinc were detected above the New York region background concentrations. The only inorganic that exceeded the eastern United States background concentration range was lead. Hexavalent chromium was detected in

TABLE 3-5
SEDIMENT SAMPLING ANALYTICAL DATA

U.S. VANADIUM CORPORATION SITE
NIAGARA, NEW YORK

COMPOUND	CRQL/ CRDL	SD-101	SD-102	SD-102D	SD-103	SD-104	SD-105	SD-106
TCL Volatile Organic Compounds (µg/kg)								
None detected at concentrations above detection limits								
TCL Semivolatile Organic Compounds (µg/kg)								
1,2,4-Trichlorobenzene	330	–	–	50 JJ	–	–	19 JJ	150 JJ
2,4-Dimethylphenol	330	–	–	–	–	–	–	21 JJ
2-Methylnaphthalene	330	–	120 JJ	–	15 JJ	20 JJ	–	–
2-Methylphenol	330	–	–	–	–	–	–	10 JJ
4-Methylphenol	330	39 JJ	–	–	25 JJ	–	430 JJ	26 JJ
Acenaphthene	330	–	950 JJ	240 JJ	120 JJ	61 JJ	53 JJ	180 JJ
Acenaphthylene	330	–	–	8 JJ	1 JJ	–	11 JJ	76 JJ
Anthracene	330	7 JJ	570 JJ	280 JJ	110 JJ	54 JJ	45 JJ	300 JJ
Benzo(a)Anthracene	330	–	2700 J	1000 J	610 JJ	300 JJ	280 JJ	960 J
Benzo(a)Pyrene	330	21 JJ	3600 J	1500 J	660 J	220 JJ	320 JJ	880 J
Benzo(b)Fluoranthene	330	26 JJ	–	1500 J	620 JJ	240 JJ	350 JJ	630 J
Benzo(g,h,i)perylene	330	–	670 JJ	830 J	500 JJ	–	320 JJ	500 JJ
Benzo(k)Fluoranthene	330	20 JJ	–	1100 J	550 JJ	190 JJ	310 JJ	780 J
Butylbenzylphthalate	330	–	–	13 JJ	–	–	–	–
Carbazole	330	–	310 JJ	160 JJ	70 JJ	28 JJ	–	140 JJ
Chrysene	330	64 JJ	4600 J	2200 J	990 J	440 JJ	580 JJ	1500 J
Dibenzofuran	330	5 JJ	170 JJ	75 JJ	27 JJ	26 JJ	25 JJ	200 JJ
Dibenz(a,h)Anthracene	330	–	540 JJ	300 JJ	120 JJ	–	–	110 JJ
Diethylphthalate	330	–	25 JJ	19 JJ	–	–	–	–
Di-n-butylphthalate	330	–	86 JJ	48 JJ	–	–	–	–
Di-n-octylphthalate	330	–	25 JJ	21 JJ	–	–	120 JJ	4 JJ
Fluoranthene	330	71 JJ	6100 J	2800 J	1600 J	670	600 JJ	2500 J
Fluorene	330	–	260 JJ	140 JJ	64 JJ	28 JJ	41 JJ	240 JJ
Indeno(1,2,3-c,d)Pyrene	330	–	2500 J	1300 J	600 JJ	200 JJ	370 JJ	610 J
Naphthalene	330	–	290 JJ	–	–	43 JJ	–	–
N-Nitrosodiphenylamine	330	–	7 JJ	–	–	–	98 JJ	–
Phenanthrene	330	45 JJ	2700 J	1500 J	770 J	390 JJ	360 JJ	1600 J
Phenol	330	–	–	–	–	–	–	34 JJ
Pyrene	330	44 JJ	5000 J	2800 J	1300 J	400 JJ	560 JJ	2300 J
TCL Inorganic Compounds (mg/kg)								
Aluminum	40	19900	4000 J	3870 J	20000	5450	13500 J	1830
Antimony	12	18.6	22.2 []J	18.7 []J	–	–	–	14.8 []J
Arsenic	2	28.9 J	6.6 J	6.7 J	8.8 J	–	4.2 []J	–
Barium	40	153	294 J	258 J	144 J	231	277 J	133 J
Beryllium	1	1.1 []	–	–	0.62 []	–	–	–
Cadmium	1	–	–	1.3 []J	–	–	–	–

TABLE 3–5
SEDIMENT SAMPLING ANALYTICAL DATA

U.S. VANADIUM CORPORATION SITE
NIAGARA, NEW YORK

COMPOUND	CRQL/ CRDL	SD–101	SD–102	SD–102D	SD–103	SD–104	SD–105	SD–106
TCL Inorganic Compounds (mg/kg) Con't								
Calcium	1000	56500	276000 J	260000 J	7890	248000	93000 J	239000
Chromium	2	R	R	R	130 J	R	167 J	223 J
Cobalt	10	13.3 []J	9.1 []J	6.7 []J	14.7 []	6.5 []J	6.2 []J	–
Copper	5	24.5	106 J	97.5 J	25.6	17.7	93.4 J	226
Iron	20	26600	5700 J	5780 J	28300	5570	20300 J	6250
Lead	0.6	617 J	66.9 J	66.2 J	39.7 J	23.9 J	199 J	27.9 J
Magnesium	1000	12300	12900 J	12700 J	5190	8380	29500 J	9290
Manganese	3	583	1330 J	1270 J	736	181	504 J	376
Mercury	0.04	0.24	–	–	0.42	–	–	–
Nickel	8	28.1	102 J	95.6 J	36.1 J	22.4	48.8 J	58.1 J
Potassium	1000	4910	490 []J	363 []J	3240	1540 []	1960 []J	–
Selenium	1	–	–	–	R	–	R	R
Sodium	1000	366 []	349 []J	335 []J	–	509 []	308 []J	226 []
Vanadium	10	40.5	18.4 []J	16.6 []J	40.5	18.2 []	33.6 J	9.2 []
Zinc	4	66.7 J	217 J	213 J	90.0 J	50.1 J	631 J	92.6 J
Hexavalent Chromium (mg/kg)	0.2	0.59	3.50	NA	3.23	2.82	6.83 J	2.02
EP Toxicity (mg/L)								
Arsenic: 5 mg/L[1]	0.043	–	–	–	–	–	–	–
Barium: 100 mg/L[1]	0.010	0.596 J	0.198 []J	0.208 J	0.778	0.638 J	0.767	0.524
Cadmium: 1 mg/L[1]	0.003	–	–	–	–	–	–	–
Chromium: 5 mg/L[1]	0.005	–	0.0268 J	0.0286 J	–	0.0638 J	–	0.0395
Lead: 5 mg/L[1]	0.04	–	–	–	–	–	–	–
Mercury: 0.2 mg/L[1]	0.0002	–	–	–	–	–	–	–
Selenium: 0.4 mg/L[1]	0.051	–	0.101 J	–	–	–	–	–
Silver: 5 mg/L[1]	0.004	–	–	–	–	–	–	–
Hazardous Waste Characteristics								
Corrosivity: pH≤2 or ≥12.5[1]		8.17	9.3	9.35	6.00	9.38	9.35	9.50

NOTES:

CRQL = Contract Required Quantitation Limit (organics)
CRDL = Contract Required Detection Limit (inorganics)
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
– = not detected

J = estimated
JJ = estimated below sample specific CRDL
NA = not analyzed
[ ] = less than sample specific CRQL
D = duplicate
[1] = Criteria of hazardous waste characteristics as set forth in 6 NYCRR Part 371, January 31, 1992.

all sediment samples analyzed.

EP Toxicity extracts contained detectable levels of barium, chromium, and selenium, but all were below regulatory limits for definition of characteristic hazardous waste. Sediment samples tested for corrosivity did not exhibit characteristics of hazardous waste.

3.4.4 Groundwater/Leachate Sampling Analytical Results

Eight groundwater/leachate samples from existing monitoring wells (MW-1, MW-1A, MW-4A, MW-5, MW-12, MW-12A, MW-14N) and one duplicate (MW-1 DUP) were collected at the Vanadium site. Samples were analyzed for TCL VOCs, TCL SVOCs, TCL inorganics, and hexavalent chromium. Results of these analyses and field pH measurements are summarized in Table 3-6.

TCL VOCs detected in aqueous samples were 1,2-dichloroethene, trichloroethene, acetone, and vinyl chloride. A total of nine TCL SVOCs were detected. Eighteen TCL inorganics were detected in the samples, and hexavalent chromium was detected in all samples except for MW-5 and MW-14N.

Analytical data were compared to New York State Groundwater Class GA Water Quality Standards, which are listed on Table 3-6. Vinyl chloride, trichloroethene, and phenol exceeded the Class GA standard indicating a contravention of standards. The hexavalent chromium standard of 50 μg/L was exceeded in MW-4A and MW-5A. Inorganics that exceeded the Class GA Standards included

TABLE 3-6
GROUNDWATER/LEACHATE SAMPLING ANALYTICAL DATA

U.S. VANADIUM CORPORATION SITE
NIAGARA, NEW YORK

COMPOUND	NYS CLASS GA (µg/L)	CRQL/ CRDL	MW-1	MW-1A	MW-1 DUP	MW-4A	MW-5	MW-5A	MW-12	MW-12A	MW-14N
TCL Volatile Organic Compounds (µg/L)											
1,2-Dichloroethene (total)	ns	10	–	–	–	–	–	–	13	–	11
Acetone	ns	10	–	–	–	50 J	–	–	–	–	–
Trichloroethene	5	10	–	–	–	–	–	–	–	–	21
Vinyl Chloride	2	10	–	–	–	–	–	–	7 JJ	–	–
TCL Semivolatile Organic Compounds (µg/L)											
2,2'-oxybis(1-Chloropropane)	ns	10	–	–	–	1 JJ	–	–	–	–	–
Acenaphthene	20 G	10	–	–	–	–	3 JJ	–	–	–	–
bis(2-Ethylhexyl)phthalate	50	10	12 J	24 J	12 J	1 JJ	–	–	–	–	–
Fluoranthene	50 G	10	–	–	–	–	2 JJ	–	–	–	–
Fluorene	50 G	10	–	–	–	–	4 JJ	–	–	–	–
N-Nitrosodiphenylamine	50 G	10	–	–	–	–	13	–	–	–	–
Phenanthrene	50 G	10	–	–	–	1 JJ	1 JJ	–	–	–	–
Phenol	1[1]	10	–	660 D	–	6 JJ	–	–	–	–	–
Pyrene	50 G	10	–	–	–	–	2 JJ	–	–	–	–
TCL Inorganic Compounds (µg/L)											
Aluminum	ns	200	183 []J	46.5 []	421 J	–	90.4 []	–	3100	2230	–
Antimony	3 G	60	–	–	–	–	–	39.8 []	–	–	–
Barium	1000	200	31.3 []	21.3 []	35.8 []	130 []	72.3 []	79.0 []	97.9 []	44.5 []	125 []
Calcium	ns	5000	168,000	87,000	172,000	694,000	35,800	90,300	167,000	95,100	138,000
Chromium	50	10	–	–	–	1480 J	50.0 J	–	23.9 J	161 J	–
Cobalt	ns	50	–	–	–	–	–	–	–	11.0 []	–
Copper	200	25	6.3 []	51.7	–	8.0 []	26.7	–	8.9 []	18.7 []	–
Cyanide	100	10	–	540	–	–	–	–	–	–	–
Iron	300	100	R	R	R	–	R	R	R	R	R
Lead	25	3	R	R	R	R	R	R	R	R	R
Magnesium	35,000 G	5000	76600	1620 []	78700	–	84700	42600	90200	64500	62000
Manganese	300	15	22.6 J	11.3 []	42.4 J	–	428	237	505	148	116
Mercury	2	0.2	–	–	–	0.79	0.28	–	–	–	–
Nickel	ns	40	–	–	–	–	–	–	–	23.5 []	–
Potassium	ns	5000	1320 []	392000	921 []	11100	6270	6190	8950	3380 []	2070 []
Sodium	20,000	5000	48,800	251,000	45,700	37,200	4,150 []	41,000	126,000	9,790	55,400

TABLE 3-6
GROUNDWATER/LEACHATE SAMPLING ANALYTICAL DATA

U.S. VANADIUM CORPORATION SITE
NIAGARA, NEW YORK

COMPOUND	NYS CLASS GA (µg/L)	CRQL/ CRDL	MW-1	MW-1A	MW-1 DUP	MW-4A	MW-5	MW-5A	MW-12	MW-12A	MW-14N
TCL Inorganic Compounds (µg/L) Con't											
Vanadium	ns	50	–	–	5.2 []	–	–	–	9.8 []	5.5 []	5.1 []
Zinc	300	20	579	474	477	–	62.8	–	49.4	64.8	653
Hexavalent Chromium (mg/L)	0.05	0.01	0.02	0.02	0.01	1.56	–	0.09	0.03	0.04	–
pH[2]	6.5≥pH≥8.5		7.62	10.59	NA	13.21	8.01	8.12	7.51	7.95	6.95

NOTES:

CRQL = Contract Required Quantitation Limit (organics)

CRDL = Contract Required Detection Limit (inorganics)

(µg/L) = micrograms per liter

(mg/L) = milligrams per liter

[ ] = less than sample specific CRDL

– = not detected

ns = no standard available

[2] = pH measurements were taken during Task 3 field investigations. The maximum pH reading is shown, for further results see Volume 2.

R = rejected

J = estimated

JJ = estimated below sample specific CRQL

D = diluted

DUP = duplicate

G = Guidance Value

[1] = NYS Groundwater phenol standard of 1 µg/L is for total phenolic compounds.

NA = not analyzed

chromium, cyanide, magnesium, manganese, sodium, and zinc. Several inorganics that exceeded the Class GA standard were also detected in the leachate samples.

Groundwater samples were not analyzed for corrosivity in the laboratory; however, pH measurements taken in the field ranged from 6.3 to 13.2. Measurements of pH greater than 12.5 exceed the regulatory limits for a D002 corrosive characteristic hazardous waste. The pH readings in excess of 8.5 indicate a contravention of standards and a significant threat to public health and the environment.

4.0 ASSESSMENT OF DATA ADEQUACY AND RECOMMENDATIONS

The following subsections further evaluate the findings presented in Section 3.0 against the purpose of the PSA investigation to establish whether hazardous waste was disposed of on site and evaluate whether the site poses a potential significant threat to public health or the environment.

4.1 HAZARDOUS WASTE DEPOSITION

Information obtained during the Task 1 Data Records Search and Assessment indicated that characteristic hazardous wastes were disposed of on site. A sample of ferrochrome silicon dust failed EP Toxicity for selenium and a sample of ferrochrome silicon dust failed EP Toxicity for chromium. Interagency Task Force records show that baghouse dust containing ferrochromium silicon dust were disposed of by Airco Alloys on site from 1971 to shortly after 1984. As defined by 6 NYCRR 371.4(c), emission control dust from ferrochromium silicon production is a K090 listed hazardous waste. This hazardous waste was disposed of on the SKW and Airco properties and potentially on portions of the Niagara Mohawk and PASNY properties (NYSDEC, 1993). In addition, there were high pH levels recorded in shallow monitoring wells (MW-2A and MW-4A), a deep well (MW-2), and in surface water (SW-6, SW-6A, and SW-7). The pH levels were consistently in excess of 12.5 (E.C. Jordan Co., 1991b). As set forth in New York State hazardous waste regulations (6 NYCRR Part 371.3(c)(1)(i)), the site surface water and groundwater/leachate itself are corrosive based on pH readings in excess of 12.5. This indicates that these media would have to be managed in a manner similar to a D002 corrosive hazardous waste.

Waste material sampled during the Task 3 field investigation found no exceedances above regulatory limits for EP Toxicity (metals only). These samples did detect leachable levels of arsenic, barium, chromium, lead, selenium, and silver, the concentrations were below regulatory limits.

4.2 SIGNIFICANT THREAT DETERMINATION

NYSDEC regulations pertaining to Inactive Hazardous Waste Sites, 6 NYCRR Part 375, set forth a number of definitions of significant threat. For purposes of the Task 3 investigation, significant threat is established by the contravention of environmental quality standards. Significant threat was evaluated by comparing surface water and groundwater sample results to New York State Class C Surface Water Standards and Groundwater Quality Class GA Standards, respectively.

During Task 3, phenol, iron, and hexavalent chromium were all detected in surface water samples at concentrations greater than Class C Surface Water Standards. The samples also exceeded the Class C surface water pH range of 6.5 to 8.5. These exceedances indicated a contravention of standards and a significant threat to public health and the environment.

The concentration of hexavalent chromium detected in surface water samples collected away from the area of waste disposal (i.e., SW-101, SW-103, and SW-105) was considerably lower than the concentrations detected in samples collected from, or immediately downgradient, of the areas of waste (i.e., SW-102, SW-104, and SW-106) (Figure 1-2). Hexavalent chromium was not detected in surface water samples SW-105, collected upgradient of the site and SW-103, collected cross-gradient of the site. Hexavalent chromium was detected at 0.02

mg/L at SW-101 where the surface water enters the Airco property. Hexavalent chromium was detected at higher concentrations in SW-104 and SW-106 (0.89 mg/L and 0.35 mg/L, respectively). SW-104 was collected near areas of waste on the Airco property and SW-106 was collected from the SKW property. Hexavalent chromium was also detected at 0.16 mg/L at SW-102 which was collected from the area of ponded water to the south of the SKW property. These results indicate that the hexavalent chromium contamination seen in the surface water is attributable to the wastes disposed by SKW and Airco on their respective properties (NYSDEC, 1993).

The pH measured in surface water follows a similar pattern to the concentration of hexavalent chromium detected in surface water. Lower values of pH were measured in off site samples as compared to on site samples, indicating that the impact of surface water alkalinity is attributable to wastes disposed of on site. Surface water pH of upgradient samples SW-105 and SW-101 was 7.2 and 10.01, respectively. The pH of cross-gradient sample SW-103 was 7.5. On site and downgradient samples all had pH measurements greater than 12. Samples SW-104 and SW-106 collected from the Airco and SKW properties had pH values of 12.81 and 12.4, respectively. Downgradient sample SW-102 had only a slightly lower pH measured at 12.2. This comparison of pH measurements would indicate that the waste materials on the site are impacting the pH of surface water (NYSDEC, 1993).

Groundwater samples were compared to New York State Groundwater Quality Class GA Standards. Vinyl chloride, trichloroethene, phenol, hexavalent chromium, chromium, cyanide, magnesium, manganese, sodium, and zinc concentrations exceeded their respective groundwater standards. Shallow

groundwater samples exceeded the Class GA pH range with levels from 7.4 to 13.2. The Class GA pH range was not exceeded in the deep wells. These exceedances indicated a contravention of standards.

4.3 RECOMMENDATIONS

Information reviewed by ABB-ES during the Task 1 investigation indicates the presence of characteristic hazardous waste at the Vanadium site as defined by 6 NYCRR Part 371 (NYSDEC, 1992a). Data from Task 1 and Task 3 showed numerous pH levels exceeding the characteristic hazardous waste range for pH. In addition, there were exceedances of both the New York State Groundwater Quality Class GA and the Class C Surface Water Standards which indicate a contravention of standards and a significant threat to public health and the environment. Interagency Task Force records indicate the disposal of a listed K090 hazardous waste containing ferrochromium silicon dust by Airco Alloys on site from 1971 to shortly after 1984. It is estimated that during this time period approximately 70,000 tons of this waste were generated and disposed of on site. As per 6 NYCRR 371.4(c), emission control dust or sludge from ferrochromium silicon production is a K090 listed hazardous waste (NYSDEC, 1993).

Based on these results, it is recommended that the Vanadium site be reclassified from a Class 3 to a Class 2 hazardous waste site. The presence of a characteristic hazardous waste, documentation of disposal of a listed hazardous waste, and significant threat have been documented at the Vanadium site. Therefore, PSA Tasks 4 through 6 will not be conducted.

ABB-ES	ABB Environmental Services
AES	Advanced Environmental Services, Inc.
Airco	Airco Properties, Inc.
bgs	below ground surface
CFR	Code of Federal Regulations
DO	Dissolved Oxygen
Eh	oxidation-reduction potential
EP	Extraction Procedure
HASP	Health and Safety Plan
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
Niagara Mohawk	Niagara Mohawk Power Corporation
NYCRR	New York Compilation of Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYTEST	NYTEST Environmental, Inc.
PASNY	Power Authority for the State of New York
PID	photoionization detector
PSA	Preliminary Site Assessment
QAPP	Quality Assurance Project Plan
SLC	Secured Landfill Consultants/Constructors, Inc.
SKW	SKW Alloys, Inc.
SVOCs	semivolatile organic compounds
TCL	Target Compound List
Vanadium	U.S. Vanadium Corporation
VOCs	volatile organic compounds
YSI	Yellow Springs Instrument

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APPENDIX A

NYSDEC REGISTRY SITE CLASSIFICATION DECISION FORM

Original-BHSC
Copy-REGION
Copy-DEE
Copy-DOH
Copy-PREPARER

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

REGISTRY SITE CLASSIFICATION DECISION

1. SITE NAME	2. SITE NO	3. TOWN/CITY/VILLAGE	4. COUNTY
[redacted] Vanadium Corporation	932001	Niagara	Niagara

5. REGION	6. CLASSIFICATION
9	Current 3 Proposed 2 Modify

7. LOCATION OF SITE (Attached U.S.G.S Topographic Map showing site Location)

a. Quadrangle	b. Site Latitude	Longitude	c. Tax Map Number
Niagara Falls, Lewiston	43°07'22" N	79°02'56" W	N/A

8. BRIEFLY DESCRIBE THE SITE (Attach site plan showing disposal/sampling locations)

The SKW site is located off Witmer Road in the Town of Niagara, New York. The site area is currently undefined and consists of properties owned by SKW Alloys, Airco Properties, Niagara Mohawk and PASNY. Both SKW and Airco constructed landfills on their respective properties. The site is bordered on the north by an automobile parking area, on the south by a swampy area and property owned by Union Carbide, to the west by Witmer Road and several auto junk yards and to the east by Interstate 190.

a. Area 62+ acres b. EPA ID Number D096311527

c. Completed ( ) Phase I ( ) Phase II (X) PSA ( ) RI/FS (X) PA/SI ( ) Other

9. HAZARDOUS WASTES DISPOSED

There is documentation of hazardous waste disposal on site. Documenteted disposal of ferrochromium silicon dust, a K090 hazardous waste, by Airco properties exists. Measurements of pH in groundwater wells, and surface water exceed 12.5. As indicated by CFR 261.3C2 and the Federal Registry, May 19, 1980, Vol. 45, Page 33096, the surface water and groundwater are considered a characteristic hazardous waste. In 1984, one sample of ferrosilicon dust failed EP Toxicity for selenium and one sample of ferrochromium silicon dust failed EP Toxicity for chromium. The pH measurements in the surface water and groundwater indicate the presence of a D002 corrosive characteristic hazardous waste.

10. ANALYTICAL DATA AVAILABLE

a. ( ) Air (X) Groundwater (X) Surface Water (X) Soil (X) Waste (X) EPTox ( ) TCLP

b. Contravention of Standards or Guidance Values

Contravention of standards were found in surface water samples containing concentrations of phenol, iron, and hexavalent chromium greater than Class C surface water standards. Samples also exceeded the Class C pH range of 6.5 to 8.5. Exceedances for groundwater samples were in vinyl chloride, trichloroethene, phenol, chromium, manganese, hexavalent chromium, cyanide, magnesium, sodium, and zinc. These exceedances indicate a contravention of standard.

11. JUSTIFICATION FOR CLASSIFICATION DECISION

Based on the information developed during the Task 1 and Task 3 investigations, the presence of hazardous waste has been documented and significant threat has been determined.

12. SITE IMPACT DATA

a. Nearest surface water: Distance on site ft. Direction West Classification C (flows to Bloody Run Creek)

b. Nearest groundwater: Depth 20 ft. Flow Direction SW ( ) Sole Source ( ) Primary ( ) Principal
c. Nearest water supply: Distance 1,200 ft. Direction N Active (X)Yes ( )No
d. Nearest building: Distance 500 ft. Direction on site Use Industrial

e. In State Economic Development Zone?	( )Y	(X)N	i. Controlled site access?	( )Y	(X)N
f. Crops or livestock on site?	( )Y	(X)N	j. Exposed hazardous waste?	(X)Y	( )N
g. Documented fish or wildlife mortality?	( )Y	(X)N	k. HRS Score N/A		
h. Impact on special status fish or wildlife resource?	( )Y	(X)N	l. For Class 2: Priority Category N/A		

13. SITE OWNER'S NAME	14. ADDRESS	15. TELEPHONE NUMBER
a) SKW Alloys, Inc. b) Airco Properties c) Niagara Mohawk	a) 380 Highland Avenue, Niagara Falls, NY 14305 b) 4861 Packard Road, Niagara Falls, NY 14303 c) 535 Washington Street, Buffalo, NY 14212	

16. PREPARER	17. APPROVED
Signature Date	Signature Date
Kathleen Maguire P.E., Geotechnical Engineer, ABB-ES Name, Title, Organization	Name, Title, Organization

APPENDIX B

SITE INSPECTION FORM
(USEPA FORM 2070-13)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION	
01 STATE: New York	01 SITE NUMBER: D096311527

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
[redacted] Vanadium Corporation Site	Witmer Road

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG. DIST
Town of Niagara	New York	14305	Niagara		

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
43° 07' 22".N	079° 02' 56".W	X A. PRIVATE _ B. FEDERAL _____ _ C. STATE _ D. COUNTY _ E. MUNICIPAL _ F. OTHER _____ _ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
10 / 26 / 92 (MONTH DAY YEAR)	X ACTIVE _ INACTIVE	1920 (BEGINNING YEAR) | present (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
_ A. EPA _ B. EPA CONTRACTOR _____ (Name of firm) _ C. MUNICIPAL _ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
_ E. STATE X F. STATE CONTRACTOR ABB-ES (Name of firm) _ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Kathleen Maguire	Geotechnical Engineer	ABB-ES	(207) 775-5401
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Glenn Daukas	Geologist	ABB-ES	(207)775-5401
Deb Cianchette	Geologist	ABB-ES	(207)775-5401
Shelley Pressley	Engineer	ABB-ES	(207)775-5401
Sri Maddineni	Environmental Engineer II	NYSDEC	(518)457-0638
Mike Hinton	Environmental Engineer II	NYSDEC Region 9	(716)851-7220

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
X PERMISSION ☐ WARRANT	N/A	Overcast ~50° F

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Sri Maddineni	New York State Department of Conservation	(518) 457-0638

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	03 DATE
Kathleen Maguire		ABB Environmental Services	(207) 775-5401	8/06/93 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

EPA

I. IDENTIFICATION	
01 STATE: New York	01 SITE NUMBER: D096311527

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- X A. SOLID
- X B. POWDER, FINES
- _ C. SLUDGE
- _ D. OTHER (Specify)
- X E. SLURRY
- X F. LIQUID
- _ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS: 102,000
- CUBIC YARDS:
- NO. OF DRUMS:

03 WASTE CHARACTERISTICS (Check all that apply)

- X A. TOXIC
- X B. CORROSIVE
- _ C. RADIOACTIVE
- X D. PERSISTENT
- _ E. SOLUBLE
- _ F. INFECTIOUS
- _ G. FLAMMABLE
- _ H. IGNITABLE
- _ I. HIGHLY VOLATILE
- _ J. EXPLOSIVE
- _ K. REACTIVE
- _ L. INCOMPATIBLE
- _ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			This site has two permitted landfills used by
OLW	OILY WASTE			SKW Alloys and Airco Carbon to dispose of
SOL	SOLVENTS			ferrochrome silicon alloy dust, and ferro
PSD	PESTICIDES			silicon dust by products of ferro alloy production.
OCC	OTHER ORGANIC CHEMICALS			The site also includes land owned by the Niagara
IOC	INORGANIC CHEMICALS	Unknown		Mohawk Power Corporation which contains several
ACD	ACIDS			piles of uncontained slag materials.
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04/STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
IOC	ferrochrome silicon	--		50,000	tons
IOC	ferromanganese	12604-53-4		6,000	tons
IOC	ferrochrome	11114-46-8		21,000	tons
IOC	ferrosilicon dust	8049-17-0		25,000	tons
IOC	Calcium hydroxide,	1305-62-0		unknown	

This site was also reported to have been used to dispose of coke, ore, slag, raw materials, and refuse from 1920 to 1964.

K090	ferrochromium		waste piles and landfilled baghouse dust	
D002	corrosive		surface waste and groundwater	

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

EPA

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	01 SITE NUMBER
New York	D09611527

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 X A. GROUNDWATER CONTAMINATION — 02 X OBSERVED (DATE: 11/93) — _ POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: < 10 — 04 NARRATIVE DESCRIPTION

Groundwater on-site is sampled as part of Part 360 permits. Laboratory results indicate contamination from metals such as hexavalent chromium and iron, and trichloroethene, other solvents, and phenols. Several pH measurements in the groundwater exceeded 12.5 indicating the presence of a D002 corrosive characteristic hazardous waste.

01 X B. SURFACE WATER CONTAMINATION — 02 _ OBSERVED (DATE: 11/93) — X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 1,000-10,000 — 04 NARRATIVE DESCRIPTION

Potential for surface water contamination exists, lower Niagara River is approximately 1.5 miles to the west and the Lewiston Reservoir is approximately 1 mile to the northeast. Groundwater discharges to the Niagara River. Intermittent stream on-site shows contamination of chromium, barium, and manganese, and pH of 7.69-12.76. The exccedences of 12.5 of pH indicate the presence of a D002 corrosive characteristic hazardous waste.

01 X C. CONTAMINATION OF AIR — 02 _ OBSERVED (DATE:) — X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 1,000-10,000 — 04 NARRATIVE DESCRIPTION

Airborne fugitive dusts has been an historical problem. Currently landfilled dusts are slurried; however, numerous exposed piles of dust still exist.

01 _ D. FIRE/EXPLOSIVE CONDITIONS — 02 _ OBSERVED (DATE:) — _ POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: — 04 NARRATIVE DESCRIPTION

None expected.

01 X E. DIRECT CONTACT — 02 X OBSERVED (DATE: 7/90) — X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 10-100 — 04 NARRATIVE DESCRIPTION

Waste is accessible to workers on-site and to the public. Waste piles exposed and leaching to nearby surface water.

01 X F. CONTAMINATION OF SOIL — 02 _ OBSERVED (DATE:) — X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 10-100 — 04 NARRATIVE DESCRIPTION

The potential for soil contamination exists since waste materials other than the ferrosilicon dusts were disposed of or stored on site at the time of the inspection.

01 X G. DRINKING WATER CONTAMINATION — 02 _ OBSERVED (DATE:) — X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: < 10 — 04 NARRATIVE DESCRIPTION

Little potential exists as nearest drinking water wells are located north and upgradient of the site.

01 X H. WORKER EXPOSURE/INJURY — 02 _ OBSERVED (DATE:) — X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 10-100 — 04 NARRATIVE DESCRIPTION

Potential exists for worker exposure from dust generated from the waste.

01 _ I. POPULATION EXPOSURE/INJURY — 02 _ OBSERVED (DATE:) — _ POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: — 04 NARRATIVE DESCRIPTION

None expected.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS	I. IDENTIFICATION 01 STATE: New York 01 SITE NUMBER: D096311527

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 _ J. DAMAGE TO FLORA — 02 _ OBSERVED (DATE: _____) _ POTENTIAL _ ALLEGED
04 NARRATIVE DESCRIPTION

Contaminated surface water discharges to adjacent marsh/wetland. Potential exists for damage to flora.

01 _ K. DAMAGE TO FAUNA — 02 _ OBSERVED (DATE: _____) _ POTENTIAL _ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

See J.

01 _ L. CONTAMINATION OF FOOD CHAIN — 02 _ OBSERVED (DATE: _____) _ POTENTIAL _ ALLEGED
04 NARRATIVE DESCRIPTION

Potential is unknown.

01 X M. UNSTABLE CONTAINMENT OF WASTES — 02 _ OBSERVED (DATE: _____) X POTENTIAL _ ALLEGED
(Spills/Runoff/Standing liquids, Leaking drums)
03 POPULATION POTENTIALLY AFFECTED: unknown — 04 NARRATIVE DESCRIPTION

Waste was dumped indiscriminately from 1920 to early 1980's.

01 X N. DAMAGE TO OFFSITE PROPERTY — 02 _ OBSERVED (DATE: _____) X POTENTIAL _ ALLEGED
03 ACREAGE AFFECTED: unknown — 04 NARRATIVE DESCRIPTION

There exists the potential for off-site migration of dust from lime slag piles, and via surface water.

01 _ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 _ OBSERVED (DATE: _____) _ POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None expected.

01 _ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 _ OBSERVED (DATE: _____) _ POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None expected.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

Evidence of use of the site for recreational purposes was observed during the 1992 Task 3 field investigation. There is open access to portions of the site containing exposed waste piles. Unknown number of 55-gallon containers on-site.

III. TOTAL POPULATION POTENTIALLY AFFECTED: 10,000

IV. COMMENTS

It has been reported that indiscriminate dumping of industrial wastes, old machinery and raw material took place in a random manner on the entire 62 acre site. Walkover in 1992 identified 55-gallon containers and baghouse equipment disposed on-site.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

EPA

I. IDENTIFICATION	
01 STATE: New York	01 SITE NUMBER: D096311527

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
_ A. NPDES				This facility contains two separate
_ B. UIC				landfills that are presently
_ C. AIR				awaiting renewal of the two Part
_ D. RCRA				360 permits to operate. Metals have
_ E. RCRA INTERIM STATUS				been detected by groundwater sample analysis. Baghouse dust sampled in
_ F. SPCC PLAN				1984 failed EP Toxicity tests for
X G. STATE (specify)		10/20/81		selenium
_ H. LOCAL (specify)				
_ I. OTHER (specify)				
_ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
_ A. SURFACE IMPOUNDMENT		
X B. PILES	37	acres
_ C. DRUMS, ABOVE GROUND		
_ D. TANK, ABOVE GROUND		
_ E. TANK, BELOW GROUND		
X F. LANDFILL	11,000	tons/yr
_ G. LANDFARM		
_ H. OPEN DUMP		
_ I. OTHER (specify)		

04 TREATMENT (check all that apply)
- _ A. INCINERATION
- _ B. UNDERGROUND INJECTION
- _ C. CHEMICAL/PHYSICAL
- _ D. BIOLOGICAL
- _ E. WASTE OIL PROCESSING
- _ F. SOLVENT RECOVERY
- _ G. OTHER RECYCLING/RECOVERY
- _ H. OTHER (specify)

05 OTHER
- X A. BUILDINGS ONSITE

06 AREA OF SITE: 62 + (acres)

07 COMMENTS

Portions of the 62-acre site allegedly had indiscriminate dumping on-site. In addition to industrial wastes, old machinery and raw materials were placed on-site in a random manner.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (check one)

_ A. ADEQUATE, SECURE X B. MODERATE _ C. INADEQUATE, POOR _ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

SKW Alloy landfill is lined and contains a leachate collection system. Landfill is currently being closed in accordance with 6 NYCRR 360. Airco landfill is closed and does not contain a leachate collection system. Exposed wastes are not covered or contained. The slag piles on the Niagara Mohawk Power Corporation land are uncovered and unlined. Contents and number of containers unknown.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: X YES _ NO

02 COMMENTS

Landfill site is fenced and guarded, but exposed waste piles are easily accessed from the eastern part of the site.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

EPA

PART 6 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	01 SITE NUMBER
New York	D096311527

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (check as applicable)	SURFACE	WELL
COMMUNITY	A. X	A. _
NON-COMMUNITY	B. _	B. X

02 STATUS		
ENDANGERED	AFFECTED	MONITORED
A. _	B. _	C. X
D. _	E. _	F. _

03 DISTANCE TO SITE
A. Approx. 1.5 (mi)
B. 1,200 feet (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (check one)

_ A. ONLY SOURCE FOR DRINKING
X B. DRINKING (other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available)
_ C. COMMERCIAL INDUSTRIAL IRRIGATION (Limited other sources available)
_ D. NOT USED, UNUSABLE

02 POPULATION SERVED BY GROUNDWATER < 5

03 DISTANCE TO NEAREST DRINKING WATER WELL 1,200 (ft)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
20 (ft)	southwest	10-15 (ft)	2,880-158,400(gpd)	_ YES X NO

09 DESCRIPTION OF WELLS (including usage, depth, and location relative to population and buildings)

Wells on-site are used exclusively for groundwater monitoring. Wells located upgradient 0.2 miles northwest of site are used by two residences for drinking water.

10 RECHARGE AREA		11 DISCHARGE AREA	
X YES _ NO	COMMENTS - Recharge via precipitation	_ YES X NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

_ A. RESERVOIR, RECREATION DRINKING WATER SOURCE
_ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES
_ C. COMMERCIAL INDUSTRIAL
X D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Niagara River	_	1.5 (mi)
Lewiston Reservoir	_	1.5 (mi)
Bloody Run Creek	_	0.5 (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 5,540	B. 34,035	C. 58,299
NO. OF PERSONS	NO. OF PERSONS	NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION
0.2 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
12,824

04 DISTANCE TO NEAREST OFF-SITE BUILDING
500 feet

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within written vicinity of site, e.g., rural, village, densely populated urban area)

Highly industrialized area with densely populated areas within 1/2 mile of site.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

EPA

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	01 SITE NUMBER
New York	D096311527

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

_ A. 10^{-6} - 10^{-8} cm/sec X B. 10^{-4} - 10^{-6} cm/sec _ C. 10^{-4} - 10^{-3} cm/sec _ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

_ A. IMPERMEABLE (less than 10^{-6} cm/sec) _ B. RELATIVELY IMPERMEABLE (10^{-4} - 10^{-6} cm/sec) X C. RELATIVELY PERMEABLE (10^{-2} - 10^{-4} cm/sec) _ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL Ph
10-25 (ft)	unknown (ft)	5.6 - 7.3

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE		
		SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
4.0 (in)	2.5 (in)	0.5 %	East	1.3 %

09 FLOOD POTENTIAL

SITE IS IN N/A YEAR FLOODPLAIN

10 _ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. _____ (mi)	B. 2.5 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

> 1 (mi)

ENDANGERED SPECIES: > 1 mile

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS PRIME AG LAND	AGRICULTURAL LANDS AG LAND
A. 0.10 (mi)	B. 0.5 (mi)	C. 4 (mi)	D. 4 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is located in the northerly section of the City of Niagara Falls, New York, approximately 1.5 miles east of the Whirlpool State Park. It is situated in a highly industrialized area with densely populated residential areas located approximately 0.5 miles to the south and east. The area is generally flat.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	01 SITE NUMBER
New York	D096311527

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	8	NYTEST	Included in report.
SURFACE WATER	6	NYTEST	Included in report.
WASTE	8	NYTEST	Included in report.
AIR			
RUNOFF			
SPILL			
SOIL - Sediment	6	NYTEST	Included in report.
VEGETATION			
OTHER - Leachate	3	NYTEST	Included in report.

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Air	Air monitoring performed with an HNU photoionization detector; no readings
	noted above background.
pH, Eh, conductivity, Temperature, DO	Monitored during surface water, leachate, groundwater sampling. Included in report Volume II.

IV. PHOTOGRAPHS AND MAPS

01 TYPE X GROUND _ AERIAL

02 IN CUSTODY OF NYSDEC Central Office
(Name of organization or individual)

03 MAPS
X YES
_ NO

04 LOCATION OF MAPS
Sri Maddineni, NYSDEC, Albany, New York

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

Visual sample descriptions. No other field data were collected for this PSA Task 3.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

EPA

I. IDENTIFICATION

01 STATE	01 SITE NUMBER
New York	D096311527

II. CURRENT OWNER(S) / **PARENT COMPANY** (If applicable)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE	08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE
SKW Alloys		380 Highland Avenue		Niagara Falls	New York	14305							
Airco Properties, Inc.				Niagara Falls	New York	14303							
Niagara Mohawk Corp.		535 Washington Street		Buffalo	New York	14212							

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Airco Alloys		4861 Packard Road		Niagara Falls	New York	14304
Pittsburgh Metallurgical		4861 Packard Road		Niagara Falls	New York	14304
Vanadium Corp. of America		unknown				

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Airco, Inc.						

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

EPA

I. IDENTIFICATION

01 STATE	01 SITE NUMBER
New York	D096311527

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
SKW Alloys, Inc./ Carbon Graphite Group	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
3801 Highland Avenue/4861 Packard Road	

05 CITY	06 STATE	07 ZIP CODE
Niagara Falls	New York	14305

08 YEARS OF OPERATION	09 NAME OF OWNER
7	

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

PREVIOUS OPERATOR'S PARENT COMPANIES (If applicable)

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
Airco Alloys		Airco, Inc.	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
4861 Packard Road			

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
Niagara Falls	New York	14304			

08 YEARS OF OPERATION	09 NAME OF OWNER
14	

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
Vanadium Corp. of America			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
Unknown			

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER
44	

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE: New York	01 SITE NUMBER: D096311527

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Vanadium Corporation	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**
unknown	
05 CITY	**06 STATE** / **07 ZIP CODE**

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
SKW Alloys			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
3801 Highland Avenue			
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
Niagara Falls	New York 14305		
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Carbon/Graphite Group			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
4861 Packard Road			
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
Niagara Falls	New York 14305		

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	01 SITE NUMBER
New York	D096311527

II. PAST RESPONSE ACTIVITIES

01 _ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	01 SITE NUMBER
New York	D096311527

II. PAST RESPONSE ACTIVITIES (Continued)

01 _ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 _ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 11 - ENFORCEMENT INFORMATION	I. IDENTIFICATION	
		01 STATE	01 SITE NUMBER
		New York	D096311527

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION X YES _ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

SKW was issued a NYSDEC Part 360 Permit on 10/20/81; renewal of permit is under review.

Airco Carbon Corp. was issued a NYSDEC Part 360 Permit in 1981; renewal of the permit to operate is also under review.

Phase I Investigation, Ecology and the Environment, 1989.

Phase I Investigation, NUS Corporation, 1988.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Evaluation Report of Initial Data, September 1993, ABB Environmental Services, and references cited therein.

APPENDIX C

INTERAGENCY TASK FORCE ON HAZARDOUS WASTE REPORT

AIRCO Alloys

P. O. BOX [illegible], NIAGARA FALLS, NEW [illegible]

November 7, 1978

Interagency Task Force on
Hazardous Wastes
M. P. O. Box 561
Niagara Falls, New York 14302

Attention: Mr. David A. Dooley

Subject: Industrial Waste

Dear Sir:

On October 5, 1978, you directed a questionnaire to Dr. P. L. Weston concerning Airco Alloys activities in the generation and disposal of industrial waste.

The questionnaire has been completed, and is being returned along with additional information describing waste disposal practices from our ferroalloy manufacturing operations at the College and Highland Avenue plant.

If any additional information is necessary, please contact me.

Very truly yours,

L. C. Wintersteen, Manager
Environmental Control

LCW:jk
Attach.

The following information is supplied as an addendum to your questionnaire in order to clarify some items.

Beginning in 1948, the following people had charge of plant operations, and, likewise, were responsible for waste disposal:

	Charles Hausman	Deceased
	Harold Redline	
	Ed Johnson	Deceased
X	E. J. Dattisman 61 Wimbledon Drive Mobile, Alabama 36601	11/ 1/62 - 12/ 1/70
X	E. Fiorucci (ERNEST) 2710 South Avenue Niagara Falls, New York 14305 297-7083	12/ 1/70 - 12/31/71
X	F. R. Sadler (FRANK) 83 Woodbury Drive Snyder, New York 14226 838-5713	10/12/71 - 11/ 1/72
X	J. W. Frye (JAMES) 365 Glen Grove Drive 745-9527 Youngstown, New York 14174	11/ 1/72 - 5/ 1/75
	P. L. Weston 2465 Transit Road Newfane, New York 14108	5/ 1/75 - Present

Plant personnel responsible for purchasing of raw materials:

Beginning 1940's: B. Webster

Ransome DeLisle

Bob Ridgeway

D. W. Whelan

E. R. Matsulavage

Pittsburgh Metallurgical Company, and now Airco Alloys, have always manufactured ferroalloys at the Niagara Falls plant.

Stainless Steel Pigs

Silicon Metal

Ferromanganese

Ferrochromium

Ferrochrome Silicon

Ferrosilicon

Of the above, S.S. Pigs, Ferromanganese, Ferrochromium, and Ferrochrome Silicon produce slag which must be disposed.

Prior to 1970, all slags were hauled from the property by:

Friona Brothers, Inc
4806 Henry Avenue
Niagara Falls, New York

Phone: (716) 283-5105

Since 1970, practically all slag has been sold to and hauled away by:

Hasley Trucking Co., Inc.
P. O. Box 212, LaSalle Station
Niagara Falls, New York 14302

Phone: (716) 297-1550

Prior to 1964, the Witmer Road site was used for disposal of the same type material as shown above by the Vanadium Corporation of America.

All slags from Ferrochromium and Ferrochrome Silicon operations on Witmer Road site at the time of purchase, (1964), were put through a sink-float process to remove metal inclusions, which were sold, and the remaining slag sold to Friona Brothers, Inc.

For the past three years, slag with metal inclusions, (approximately 15% of production), has been stored on Witmer Road for future processing.

Acquired which have

Beginning in 1971, in order to comply with Air Pollution Regulations, a baghouse to collect furnace fume from Ferrochrome Silicon operation and Stainless Steel Pigs was installed on two furnaces. Since that time, approximately 16 tons/day or 5,600 tons/year of slurried dust has been deposited at Witmer Road. The approximate analysis of this material is:

FeCrSi Fume	%	S.S. Pig Slag Deposited Dry
SiO_2	80	25
MgO	9	5
Al_2O_3	3	10
CaO	-	50
FeO	2	-
Other	6	10

In August 1976, a new furnace was installed to produce Ferrosilicon, a slag-free process, but the furnace fume is collected in a baghouse, slurried with water, and deposited at Witmer Road.

The analysis of Ferrosilicon fume is as follows:

	%
SiO_2	93
Fe_2O_3	2
MgO	1
Other	4

It is estimated that approximately 8,000 tons/year of this fume is deposited.

L.C.Wintersteen/jk
11/3/78

ne Visit 3/1/72 by BWK
p / / by
ompleted 3/1/72 by BWK
ents:

S.E. comp

Company Name Airco Alloys Division
Address 3801 Highland Ave
Niagara Falls N.Y. 14302
County Niagara Phone 285-1252
SIC Codes 1. 3313 3.
2. 4.

New York State Hazardous Waste Survey
Department of Environmental Conservation
Division of Solid Waste Management
50 Wolf Road, Albany, N.Y. 12233 Telephone: (518) 457-6605
Room 409

B

eral Information

1. Company Name Airco Alloys

Mailing Address 3801 Highland Ave. (Street) Niagara Falls (City) N. Y. (State) 14302 (Zip)

Plant Location /X/ Same as above

(Street) (City) (State) (Zip)

2. If Subsidiary, Name of Parent Company

3 Individual Responsible for Plant Operations Dr. P. L. Weston (Name)

Plant Manager (Title) 716-285-1252 (Phone)

4. Individual Providing Information Mr. L. C. Wintersteen (Name)

Mgr. Environmental Control (Title) 716-285-1252 (Phone)

Department of Environmental Conservation Interviewer Bruce W. Knapp

tandard Industrial Classification (SIC) Codes for Principal Products

	Group Name	SIC Code (4 Digit)	Approximate % of /Production	/Value Added
a.	Ferroalloys	3313		
b.				
c.				

Processes Used at Plant

a. Electric Furnace Smelting of Ores
b.
c.
d.
e.

8. Products

a. Ferrochrome Silicon
b. Ferrosilicon
c. Stainless Steel Pigs
d.
e.

Materials and other chemicals used in manufacturing processes.

a. Quartz
b. Coke
c. Scrap
d. Chrome Ores
e.
f.
g.
h.
i.
j.

9. a. On Site Waste Water Treatment / /Yes /X/No

b. On Site Waste Water Treatment by July 1977 / /Yes /X/No

c. On Site Waste Water Treatment by July 1983 / /Yes /X/No

d. Industrial Sewer Discharge /X/Yes / /No Name of Sewage Treatment Plant Niagara Falls Water Treatment Plant

e. SPDES No. _____ NPDES No. _____

1. a. Air Pollution Control Devices /X/Yes / /No Types Baghouses (4)

b. To Be Built / /Yes / /No by / /

c. Air 100 Emission Point Registration Numbers _____

. a. Number of manufacturing employees 160 b. Manufacturing Floor Space _____ sq.ft.

. ttach a plat or sketch of the facility showing the location of on-site process waste torage (if available).

. ttach flow diagrams of chemical processes including waste flow outputs (if available).

. In-house waste treatment capabilities: None

. s there a currently used or abandoned landfill, dump or lagoon on plant property? /X/Yes / /N

ndustrial wastes produced or expected to be produced by plant.

1) Slags
2) Particulate Dusts
5)
6)
8)

Comments:

Characterization and Management Practice
separate form for each waste stream)

Waste Stream No. 3 & 4 (from Form I, Number 17)

Description of process producing waste Submerged arc furnace & Electric Melting furnace

Brief characterization of waste Particulates collected in baghouse from manufacture of FeCrSi and S S Pig.

Time period for which data are representative 1976 to

a. Annual waste production 5000 [X] tons/yr. [ ] gal./yr.

b. Daily waste production 14 [X] tons/day [ ] gal./day

c. Frequency of waste production: [ ] seasonal [ ] occasional [X] continual

[ ] other (specify)

Waste Composition Solids

a. Average percent solids ___ % b. pH range __ to __

c. Physical state: [ ] liquid, [ ] slurry, [ ] sludge, [X] solid,

[ ] other (specify)

d. Component — combination of following: Approx. 14% of No. 10 & 86% of No. 9

	Component	Average Concentration NO. 9	NO. 10	
1.				[X] wt.% [ ] ppm / [ ] wet weight [ ] dry weight
2.	SiO_2	80.5	23.7	[ ] wt.% [ ] ppm
3.	Fe_2O_3	1.9	34.0	[ ] wt.% [ ] ppm
4.	CaO	1.0	8.7	[ ] wt.% [ ] ppm
5.	MgO	9.0	2.8	[ ] wt.% [ ] ppm
6.	Al_2O_3	3.0	4.4	[ ] wt.% [ ] ppm
7.	LoI	2.5	2.1	[ ] wt.% [ ] ppm
8.	Cr_2O_3	1.4	8.7	[ ] wt.% [ ] ppm
9.	MnO	1.3	1.6	[ ] wt.% [ ] ppm
10.	C	1.0	1.8	[ ] wt.% [ ] ppm

e. Analysis of composition is / /theoretical /X/laboratory / /estimate
(attach copy of laboratory analysis if available)

f. Projected / /increase, / /decrease in volume from base year: _____ % by July 1977;
_____ % by July 1983.

g. Hazardous properties of waste: / /flammable / /toxic / /reactive / /explosive
/ /corrosive / /other (specify) _____

7. On Site Storage

a. Method: / /drum, / /roll-off container, / /tank, / /lagoon, / /other (specify) _____

b. Typical length of time waste stored _____ / /days, / /weeks, / /months years

c. Typical volume of waste stored _____ / /tons, / /gallons

d. Is storage site diked? /X/Yes / /No

e. Surface drainage collection / /Yes /X/No

8. Transportation

a. Waste hauled off site by / /you / /others

b. Name of waste hauler _____

Address _____
Street City

( )
State Zip Code Phone

9. Treatment and Disposal

a. Treatment or disposal: /X/on site / /off site

b. Waste is / /reclaimed / /treated /X/land disposed / /incinerated
/ /other (specify) _____

c. Off site facility receiving waste

Name of Facility _____

Facility Operator _____

Facility Location _____
Street City

( )
State Zip Code Phone

Disposal Site Data Sheet

Name of Site: Witmer Road Site - Anco Alloys

Location: .5 miles NE on Witmer Road from Ayd-Fisk Road. Adjacent to ACF U.S Vanadium plant
(Attach map, if available)

Present Owner: Anco Alloys

Past Owner(s): U.S Vanadium

Size of Site in Acres: ~50 acres.

Years Utilized as Disposal Site: 1920? - Present

Nature and Quantities of Materials Disposed of at Site:

FeCrSi Slag	5000T/yr	70,000T since 1964 (Most reclaimed by
FeMn Slag	20,000T/yr	280,000T " " Trucks & Hoseley Trucking
		Companies respectively
FeSi Dust	18T/DAY	16,000T since 1976 (1st installed)
FeCrSi Dust	16T/DAY	37,000T since 1971 (1st installed)

Proximity to:

Flood Plain ~4500 feet to Yellow Creek at flood peak (due East)

Rivers and Streams ~1/2 mile to Ohio River

Wells NONE BEFORE 1965 - NO DATA AVAILABLE

Homes nearest on Maple Ave East End

Other Facilities None Apparent

Visual Observations: Large piles of stored slag (open air pit) with
offsite continual landfilling operations