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EA Engineering, Science and Technology, Inc.

FINAL

REPORT OF RESULTS FOR THE PHASE I REMEDIAL INVESTIGATION AT THE LAKE ONTARIO ORDNANCE WORKS (LOOW) NIAGARA COUNTY, NEW YORK

U.S. Army Corps of Engineers
Baltimore District

July 1999

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Phase I Remedial Investigation
at the Former
Lake Ontario Ordnance Works (LOOW)
Niagara County, New York

Prepared for

U.S. Army Corps of Engineers
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Prepared by

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LIST OF ACRONYMS AND ABBREVIATIONS

AEC	Atomic Energy Commission
ALL	Alluvium
AST	Above Ground Storage Tank
AWQC	Ambient Water Quality Criteria
Bgs	below ground surface
BTEX	Benzene, Toluene, Ethyl benzene, and Xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPC	Constituents of Potential Concern
CWD	Chemical Warfare Degradation Products
CWM	CWM Chemical Services, Inc.
DCA	Dichloroethane
DCE	Dichloroethylene
DERP—FUDS	Defense Environmental Restoration Program—Formerly Used Defense Sites
DGPS	Differential Global Positioning System
DNAPL	Dense Non-Aqueous Phase Liquid
DNB	Dinitrobenzene
DNT	Dinitrotoluene
DOE	Department of Energy
ECD	Electron Capture Detector
EM	Electromagnetic
EPA	Environmental Protection Agency
EV	electron Volts
FID	Flame Ionization Detector
Ft	Foot/Feet
FS	Feasibility Study
FUSRAP	Formerly Used Sites Remedial Action Program
g	grams
gal	gallon(s)
GC	Gas Chromatograph
GPS	Global Positioning System
HEF	High Efficiency Fuels
HTRW	Hazardous, Toxic, and Radiological Waste
in.	Inch(es)

LIST OF ACRONYMS (continued)

kg	Kilograms
L	Liters
LHCU	Leachate Hydraulics Controls Upgrade
LOOW	Lake Ontario Ordnance Works
MCL	Maximum Contaminant Level
MCLGs	Maximum Contaminant Level Goals
mg	Milligrams
mL	Milliliters
NFSS	Niagara Falls Storage Site
NPDWRs	National Primary Drinking Water Regulations
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbons
PARCC	Precision and Accuracy, sample Representativeness, data Comparability, and data Completeness
PCB	Polychlorinated Biphenyls
PCE	Perchloroethylene or tetrachloroethylene
pCi	PicoCurie(s)
PCP	Pentachlorophenol
PDOP	Primary Dilution of Precision
PID	Photoionization Detector
ppm	Parts Per Million
PRC	Pseudorange Corrections
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RBC	Risk-Based Concentration
RDX	Royal Demolition Explosives
RCRA	Resource Conservation and Recovery Act
RGC	Regulatory Guidance Criteria
RI	Remedial Investigation
ROE	Right of Entry
SDWA	Safe Drinking Water Act

LIST OF ACRONYMS (continued)

SLF	Secure Landfill
SMCLs	Secondary Maximum Contaminant Levels
STARS	Spill Technology and Remediation Series
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TCA	Trichloroethane
TCE	Trichloroethylene
TCL	Target Compound List
TDS	Total Dissolved Solids
TNB	Trinitrobenzene
TNT	Trinitrotoluene
TOC	Total Organic Carbon
TOGS	Technical and Operational Guidance Series
UCT	Upper Clay Till
µg	micrograms
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USDOA	United States Department of Army
UST	Upper Silt Till
VOCs	Volatile Organic Compounds
WCA	Waterline Construction Areas
WWTP	Wastewater Treatment Plant
XRF	X-Ray Fluorescence
yd	Yard(s)

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EXECUTIVE SUMMARY

This Phase I RI of the former LOOW was conducted by EA Engineering, Science, and Technology under contract number DACA-31-94-D-0025 with the U.S. Army Corps of Engineers-Baltimore District. The investigation was performed under the Defense Environmental Restoration Program-Formerly Used Defense Sites Hazardous, Toxic, and Radiological Waste (DERP-FUDS HTRW) project. The investigation was performed after an extensive history review of the former LOOW. The intent of the Phase I RI was to evaluate possible impact from former DOD activities in areas that had not been investigated to date, and to confirm or establish the extent of potential COPC in some areas that have previously been identified as having been impacted by former DOD activities. In addition to the former TNT production facility, areas of the former LOOW that were subsequently used by the DOD for storage of chemicals and radioactive materials, operation of high-energy fuel plants, research of troposcatter communications, and operation of a NIKE Missile Base, were also investigated.

Possible impacts to surrounding media from these DOD activities were evaluated through field reconnaissance, test trenching, sampling activities, and field and laboratory analyses. Samples of surface soil, semi-subsurface soil, subsurface soil, ground-water, surface water, sediment, sludge, and wastewater were collected and submitted for field screening analyses, laboratory analyses, or both. Samples were collected between the end of May and the end of July 1998. For 17 of the areas investigated during this RI, a non-biased sampling grid was established across the area and soil samples were collected from each grid intersection using direct push methodology. In addition, "biased" sampling points were established at locations within the grid that visually appeared to have been impacted by potential COPC, and at locations expected to have been impacted by potential COPC based on historical information. Soil samples were also collected from sampling locations established in the vicinity of underground lines or other subsurface structures in three of the Phase I investigation areas (former LOOW 30-in. outfall, WWTP, and Waterline Construction Areas). Former DOD underground utility lines were sampled for sludge and wastewater (where available). Access to the sludge and wastewater was gained through manholes, and in some cases, by excavating and breaking the underground lines. Additional soil samples were collected from within test trenches and sumps, and from beneath unearthed underground lines.

Field screening of soil samples was performed to evaluate impact form potential COPC and to determine a location for placement of a temporary ground-water sampling point. Areas potentially impacted by COPC from non-DOD sources are not eligible for investigation under this DERP-FUDS HTRW project. As such, field screening analyses programs for each area were developed depending on whether an impact was expected from non-DOD site use. For those areas where there was no suspected impact from non-DOD sources or where impact from non-DOD sources was expected to be minimal or of a certain type of potential COPC, soil samples were field screened for VOCs, total PAHs, total PCB, and TNT. Soil samples from areas expected to have a more substantial impact from non-DOD site use (e.g., the former LOOW 30-in outfall line and the Navy Interim Pilot Production Plant) were field screened for TNT only. Approximately 1047 soil samples were collected and field screened from grid and biased point locations. Additional soil samples from test trenches, as well as sediment samples from surface drainages, and sludge from underground lines, were also field screened.

Ground-water samples were also collected from each area where ground water was present in enough quantity to allow for the collection of a sample. An evaluation of the presence or absence of ground water was made from the boring logs from each area. A temporary ground-water sampling point was established in the location that exhibited elevated concentrations of potential COPC, as reported in the screening results if an interval of saturated soil indicative of a ground-water producing zone was evident. However, in some areas, an interval indicative of a ground-water producing zone was not encountered in the area reporting elevated potential COPC, or was not encountered at all. Therefore, ground-water samples were sometimes collected from outside the immediate area of elevated concentrations of potential COPC in soil, or were not collected.

Five percent of the samples that were analyzed using field screening methodology, and/or at least one soil sample per area of investigation were submitted for laboratory confirmatory analysis of the field screening results. In addition, the downstream sediment sample at each drainage, as well as all ground-water samples, surface water samples, sludge samples, and wastewater samples were submitted for laboratory analyses. For those areas where there was no suspected impact from non-DOD sources, samples were analyzed for full suite TCL/TAL analytes, boron, lithium, and explosives. Those samples collected from areas expected to have been impacted by potential COPC from non-DOD sources or site use were analyzed for the DOD marker compounds boron, lithium, and explosives only. Due to the proximity of the 6-Mile Creek drainage and the 12-Mile Creek drainage to the former Northeast Chemical Warfare Depot and the former NIKE Missile Base, respectively, the samples from these drainages were also analyzed for chemical warfare degradation products and hydrazine, respectively.

The field and laboratory data collected during this Phase I investigation was evaluated to recommend a course of action for each area. The evaluation included comparison of the field screening and laboratory analytical results to NY State guidance criteria for soil, ground water, surface water, and sediment. To provide a conservative approach in eliminating areas for further investigation, the analytical results were compared to $1/10^{th}$ of the value of the NY State guidance criteria. Generally, those areas with sample results reporting concentrations of potential COPC exceeding $1/10^{th}$ of the NY State comparison criteria were recommended for further investigation. The exceptions to this were areas where the only elevated potential COPC were PAHs and/or metals. These exceptions were made due to the extensive system of deteriorating roads from the former LOOW (expected to add PAHs to soil) and the lack of adequate site specific background metals concentrations for some metals. In addition, further evaluation of the eligibility for inclusion of some areas of investigation into the HTRW project was performed. The main eligibility parameter was the areas potential for impact from COPC from non-DOD site use. The re-evaluation of eligibility lead to a recommendation for no further action (within this HTRW project) for a number of areas. Table E-1 presents a general summary of the areas that were included in this Phase I investigation, the matrices that were sampled, the field screening and laboratory analyses performed, the analyte types (and associated matrix) which were reported in exceedance of appropriate NY State guidance criteria, and the recommendation for each area. Note that the explanation of ineligibility under the HTRW guidelines can be found in the conclusions section of the report of investigation for each specific area.

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TABLE E-1 SUMMARY OF COMPONENTS AND AREAS INCLU[illegible] IN THE PHASE INVESTIGATION, RESULTS, AND RECOMMENDATIONS

Area of Investigation		Matrices Analyzed	Screening /Lab Analyses	Analyte Type that Exceeded 1/10th of the NY State Guidance Criteria	Summary and Recommendations
Component 1—CWM Property	Nitration Houses	Soil (SO), ground water (GW), sludge (SL) (evaluated within Component 7)	Full/Full[1]	Total polynuclear aromatic hydrocarbons (PAHs) (SO), various metals (SO), pesticides (SO), volatile organic compounds (VOC) (SO), various metals including boron (GW), pesticides (GW), VOCs (GW).	The elevated PAHs and VOCs in the subsurface soil are recommended for further investigation. With the exception of boron in ground water, the reported metals concentrations are most likely a representation of background concentrations and are not expected to represent a risk. In addition, the reported pesticides were encountered throughout the former LOOW in low concentrations. Further evaluation of these commonly reported but low concentration pesticides are not recommended for further investigation. Further investigation to delineate the extent of boron and VOCs in ground water is recommended.
	Area C and North of C	SO, GW	Full/DOD and Full[2]	Total PAHs (SO), VOCs (SO, GW), metals (SO, GW), explosives (SO, GW), PAHs (GW), semivolatile organic compounds (SVOCs) (GW), pesticides(GW).	A buried drum trench was discovered in Area C during the Phase I investigation. It is recommended that the containers and potentially impacted soil be removed. Further investigation to evaluate the impact to ground water is also recommended in the area of the drum trench. Due to the ineligibility for further investigation under the HTRW guidelines, no further action (under an HTRW project) is recommended for the area north of C.
	Waterline Construction Areas (WCA)	SO, GW	Full/DOD	PAH (SO), PCB (SO), VOC (SO), boron (GW).	Due to the ineligibility for further investigation under the HTRW guidelines, no further action (under an HTRW project) is recommended for the Waterline Construction Areas.
	Trash Pit	SO, GW	Full/Full	PAHs (SO, GW), PCB (SO), VOCs (SO, GW), metals (SO), pesticides (SO, GW), SVOCs (SO, GW), explosives(GW).	Removal of the trash pit and impacted soil is recommended. Further investigation to evaluate the impact to ground water is also recommended. Further evaluation of the extent of elevated PAH and PCB at the northern perimeter of the pit is recommended.
	Property G	SO, GW	Full/Full	PAH (SO), metals (SO), VOC (GW).	With the exception of the elevated PAHs and one soil sample with elevated mercury, there appears to be minimum impact to the soil. The other reported metals are most likely a representation of background concentrations and are not expected to represent a risk. Due to the additional information obtained after the Phase I investigation concerning the location of a former drum removal area, further investigation, confined to the area of the drum removal, should be performed. The elevated mercury was reported in the vicinity of the drum removal area. No further investigation is recommended for the larger, former ground-scarred area of Property G. Based on review of boring logs, very little ground water appears to be available with the Property G area. In addition, the reported VOCs did not exceed the full value of the comparison criteria. Therefore, the ground water is not recommended for further investigation in the larger, former ground-scarred area of Property G.
	AFP-68, East of Wesson St (Process Areas 2, 4, 7, 8, 11, and 20).	SO, GW, WW	Full/Full and DOD only[3]	PAH (SO, GW), PCB (SO), VOC (SO, GW), metals(SO, GW), SVOC (SO, GW), pesticides(SO,GW), explosives(GW).	Further investigation at Process Area 2 is recommended to delineate the extent of VOCs, PAHs, metals in soil, and VOCs, and PAHs in ground water. Further investigation of Process Area 4 is recommended to delineate the extent of PAHs in surface and semi-subsurface soil. The pesticides reported in the ground water at Process Area 4 (gamma-BHC at 0.0048 µg/L and heptachlor epoxide at 0.03 µg/L) exceeded the screening criteria of 0 µg/L. Due to the low reported concentrations, the discontinuous nature of the ground-water aquifer, and the low hydraulic conductivity in that area, it is not expected that these concentrations represent a significant risk. Therefore the reported pesticides in ground water will not be further investigated in Process Area 4. Process Areas 7, 8 and 11 is recommended for further investigation to delineate the extent of PAHs and PCBs in soil. Process Area 20 should be further investigated to delineate the extent of lithium and explosives in ground water. In addition, it is recommended that the analyte list be expanded to TCL/TAL analytes, boron, lithium, and explosives for possible future investigations of Area 20.

TABLE E-1 SUMMARY OF COMPONENTS AND AREAS INCLUDED IN THE PHASE INVESTIGATION, RESULTS, AND RECOMMENDATIONS

Component	Area of Investigation	Matrices Analyzed	Screening /Lab Analyses	Analyte Type that Exceeded 1/10th of the NY State Guidance Criteria	Summary and Recommendations
Component 1—CWM Property	AFP-68, West of Wesson St. (Process Areas 10, 14, 16, 18S, 22, and 24)	SO, GW	Full/Full and DOD only[4]	PAH(SO), PCB(SO), metals(SO, GW).	PAHs exceeded the full value of the NY State comparison criteria in samples collected from Area 10. Further investigation is recommended to delineate the extent of PAHs in the soil in Process Area 10. Because Process Areas 14, 22, 16, and 24 have been used by and potentially impacted by COPC from non-DOD sources, these areas are not eligible for further investigation under a HTRW project. PAHs and metals were the only constituents reported in concentrations exceeding 1/10th of the comparison criteria in Area 18S. The reported metals in this area are most likely a representation of background concentrations and are not expected to represent a risk. The reported PAH concentrations did not exceed the full value of the criteria. Therefore, no further investigation is recommended for Process Area 18S.
	Navy IPPP	SO, GW	DOD/DOD	None.	Elevated boron concentrations were reported in the ground-water sample collected on the west side of the Navy IPPP (see results from WCA), suggesting an impact from former DOD use within the Navy IPPP. However, the Navy IPPP is located within an area that is heavily used by and potentially impacted by the current land owner (CWM). Therefore, the area is not eligible for further investigation under a HTRW project.
Component 2—Somerset Group	Ground Scar	SO	Full/Full	PAH (SO), metals (SO).	PAHs and metals were the only constituents reported in concentrations exceeding 1/10th of the comparison criteria in the former Ground Scar Area. The reported metals in this area are most likely a representation of background concentrations and are not expected to represent a risk. The reported PAH concentrations did not exceed the full value of the criteria. Therefore, no further investigation is recommended for the former Ground Scar Area.
	T-1 and T-2	SO	Full/Full	PAH (SO), metals (including chromium) (SO).	With the exception of the reported concentration of chromium, the reported metals in this area is most likely a representation of background concentrations and are not expected to represent a risk. However, further investigation to delineate the extent of PAHs and chromium in soil is recommended.
	T-3	SO	Full/DOD	PAH (SO).	The reported PAH concentrations were reported in the surface soils only and is likely due to deteriorating road surfaces and the nearby railroad. The reported concentrations did not exceed the full value of the criteria. No further investigation is recommended for T-3.
	Process Areas 3 and 5	SO, GW	Full/Full and DOD only[5]	PAH (SO), metals (SO, GW), VOCs (GW), pesticides(GW), explosives(GW).	The elevated PAHs and explosives in Area 3 are recommended for further investigation. It is further recommended that the analyte list for this area be expanded to full suite for possible future investigation. The elevated metals (lithium) and VOCs reported in the ground water in Area 5 are recommended for further investigation. Delineated the extent of lithium in the ground water in Process Area 5. With the exception of the elevated lithium, the reported metals concentrations are most likely a representation of background concentrations and are not expected to represent a risk. The reported pesticide (heptachlor epoxide at 0.0067 μg/L) has a screening criteria of 0 μg/L. Due to the low reported concentration, the discontinuous nature of the ground-water aquifer, and the low hydraulic conductivity in that area, it is not expected that this concentration represents a significant risk. In addition to the potential COPC reported in the results from the Phase I investigation, elevated PAHs and chromium reported in Process Area 5, and elevated PCBs were reported in Process Area 3 in previous investigations (Acres 1992). These elevated concentrations of potential COPC are recommended for further investigation.
	Process Area 18N	SO, GW	Full/Full	PAHs(SO), metals (SO).	The reported metals are most likely a representation of background concentrations and are not expected to represent a risk. Because the reported total PAH concentration exceeded the full value of the comparison criteria, it is recommended that the reported PAHs be further evaluated.

TABLE E-1 SUMMARY OF COMPONENTS AND AREAS INCLU... IN THE PHASE INVESTIGATION, RESULTS, AND RECOMMENDATIONS

Area of Investigation		Matrices Analyzed	Screening /Lab Analyses	Analyte Type that Exceeded 1/10th of the NY State Guidance Criteria	Summary and Recommendations
Component 2	Process Area 30A.	SO	Full/Full	PAH (SO), metals (SO).	The reported metals are most likely a representation of background concentrations and are not expected to represent a risk. An interim removal action of the miscellaneous containers with Building 30A has been performed. Confirmatory sampling around the building is recommended to confirm that there has been no impact from the storage and removal of the containers.
Comp. 3—Town of Lewiston	WWTP	SO, GW	Full/DOD	PAHs(SO), metals (SO, including boron and lithium in GW), VOCs (SO).	Although the elevated boron and lithium indicate a potential impact from DOD activities, the WWTP has received waste from several non-DOD sources. As such, the WWTP is not eligible for further investigation under a HTRW project.
	Vicinity Shops	SO, GW	Full/Full	PAHs(SO), metals (SO including boron and lithium in GW), pesticides(GW).	Further investigation is recommended to delineate the extent of metals (including boron and lithium) in ground water and PAHs in soil. The reported pesticide alpha-BHC at 0.0082 µg/L) has a screening criteria of 0 µg/L. Due to the low reported concentration, the discontinuous nature of the ground-water aquifer, and the low hydraulic conductivity in that area, it is not expected that this concentration represents a significant risk. The reported metals in soil are most likely a representation of localized background concentrations and are not expected to represent a risk.
Component 5—Niagara Falls Storage Site (NFSS) U. S. Government	Acid Concentration Area	SO, GW	Full/Full	PAHs (SO), PCB (in the sumps only), metals (SO, GW), VOCs (SO), SVOCs (SO), pesticides(SO, GW).	The acid concentration area is recommended for further investigation to delineate the extent of PAHs in soil and lead in ground water. In addition, several sump-like structures were identified within the acid concentration area. Samples collected from within these sumps reported elevated concentrations of several potential COPC. The sumps are recommended for further investigation. The reported VOCs in soil included acetone, which was also reported in the associated blank and is therefore not recommended for further investigation. Methylene chloride was also reported but is a common laboratory contaminant. The low concentrations of reported pesticides are not recommended for further evaluation.
	Shop Area South of O Street	SO, GW	Full/Full	PAHs(SO), metals (SO, GW), VOCs (SO, GW), pesticides (SO, GW).	Further investigation is recommended to delineate the extent of PAHs, in soil. The reported metals are most likely a representation of background concentrations and are not expected to represent a risk. The extent of VOCs in soil and ground water should be further investigated. The only pesticide reported in the ground water was alpha-BHC at 0.01 µg/L, for which the screening value is zero. The low concentrations of reported pesticide in soil and ground water is not recommended for further investigation. The reported metals concentrations in ground water are most likely a representation of background concentrations and are not expected to represent a risk.
	WWTP Vicinity Shops	SO, GW	Full/Full	PAHs (SO), metals (SO, including boron and lithium in GW), explosives (GW).	The reported metals in soil are most likely a representation of background concentrations and are not expected to represent a risk. However, the elevated boron and lithium, as well as explosives, reported in the ground-water sample collected from the WWTP vicinity shops area is recommended for further investigation. The reported PAHs in soil is also recommended for further investigation.
Component 6 Modern Disposal	Former LOOW Incinerator	SO	Full/Full	PAH(SO), metals (SO).	The extent of PAHs in soil should be further investigated. The reported metals are most likely a representation of background concentrations and are not expected to represent a risk.

TABLE E-1 SUMMARY OF COMPONENTS AND AREAS INCLUDED IN THE PHASE INVESTIGATION, RESULTS, AND RECOMMENDATIONS

Area of Investigation		Matrices Analyzed	Screening /Lab Analyses	Analyte Type that Exceeded 1/10th of the NY State Guidance Criteria	Summary and Recommendations
Component 7	Former LOOW Underground Lines	SL,WW	Full and DOD only[6]/Full and DOD[7]	PAHs (sludge on Components 1, 3 and 5), PCB (sludge on Components 1 and 5), metals (sludge on Components 1 and 5), pesticides (sludge on Components 1 and 5), VOCs (sludge, primarily on Component 1), SVOA (sludge on Components 1 and 5). Metals, including boron (wastewater on Components 1, 5, and 3), SVOCs (wastewater on Component 5). explosives (wastewater on Component 1).	Results indicate that the former LOOW underground lines contain wastewater and sludge with COPC in concentrations that exceed screening criteria. Due to the age of the lines and the potential for deterioration of the concrete and vitreous clay, there exists the possibility of impact to the surrounding media from the COPC within the pipelines. The highest concentrations of potential COPC were reported in an excavated line near the nitration houses, and the sumps within the acid concentration area. The presence of explosives and boron reported in wastewater in concentrations that exceed ground-water screening criteria within some of the manholes within Component 1 and Component 3 suggest impact from DOD use. However, those underground lines within Component 1 and Component 3 have been impacted by non-DOD sources. As such, these lines are not eligible for further investigation under a HTRW project Further investigation is recommended to evaluate the extent to impact from potential COPC to subsurface soils and ground water in the vicinity of the sumps within the acid concentration area of Component 5. Additionally, further investigation is recommended to evaluate the possibility of impact from COPC to the subsurface soil in the vicinity of the underground storm water, sanitary sewer, and acid waste lines within Component 5 and to ground-water in the vicinity of the manhole NFSS-ST9 which contained wastewater exhibiting phenols exceeding ground-water criteria. Pesticides also exceeded the ground-water criteria in the wastewater samples collected from manholes within Component 5, but the concentrations were less than 0.01 µg/L and are therefore not recommended for further investigation.
Component 8	Surface Water Drainages	SW, SED	Full/DOD only[8]	PCB(sediment in H and M ditch), Hydrazine (surface water).	Because the hydrazine was reported in a drainage that is likely to have been impacted by non-DOD sources, the drainage is not eligible for further investigation with regard to potential COPC other than hydrazine. Because there is the possibility that the H Ditch may have been impacted from non-DOD sources, the reported PCB in this drainage is not eligible for further investigation under a HTRW project. It is recommended that the reported presence of PCB in the M Ditch be confirmed and the extent of impact evaluated.

1 Target Compound List (TCL)/Target Analyte List (TAL) analytes, boron, lithium, and explosives.
2 Samples collected from the Area North of C were analyzed by the laboratory for DOD marker compounds only (boron, lithium, and explosives). Samples collected from within the drum trench were analyzed for full suite.
3 Samples collected from Process Area 20 on AFP-68 were analyzed by the laboratory for DOD marker compounds only. Samples collected from Areas 2, 4, 7, 8, and 11 were analyzed for full suite.
4 Samples collected from Process Areas 14, 16, 22, and 24 were analyzed by the laboratory for DOD marker compounds only. However, the ground-water sample from Process Area14/16 was inadvertently analyzed for full suite parameters. Samples collected from Areas 10 and 18S were analyzed for full suite parameters.
5 Samples collected from Process Area 3 were analyzed by the laboratory for DOD marker compounds only.
6 Sample collected from along the 30-in. outfall line were field screened for DOD marker compounds (TNT) only.
7 Samples collected from the lines north of and within the former LOOW WWTP were analyzed for DOD marker compounds only, with the exception of NH-SL-PIPE1. The remaining samples, generally collected within the NFSS were analyzed for full suite. Also note that the NY State surface water and sediment screening criteria was used because the potential for sludge and wastewater to impact surface water and sediment of the Niagara River through the currently operating Town of Lewiston WWTP, particularly from the area of the NFSS.
8 In addition to boron, lithium, and explosives, samples from the 6-Mile Creek drainage and the 12-Mile Creek drainage were analyzed for chemical degradation products and hydrazine, respectively.

1. INTRODUCTION

1.1 PROJECT OBJECTIVES

The purpose of this sitewide Remedial Investigation/Feasibility Study (RI/FS) is to assess potential environmental impacts, eligible for investigation under the Defense Environmental Restoration Program–Formerly Used Defense Sites (DERP–FUDS) HTRW project, to the former Lake Ontario Ordnance Works (LOOW) (7,500 acres) resulting from former Department of Defense (DOD) use of the property. Previous investigations have been conducted to evaluate specific areas of the former LOOW. This RI/FS was designed to incorporate areas that have not been included in previous investigations, as well as to further investigate previously identified areas. As the first step in the RI/FS process, a historical search was conducted in 1997 to review the available information regarding past operations and investigations. Areas of potential environmental concern were identified in a history search report (EA 1998a). The *Final Work Plan for Phase I RI at LOOW* (EA 1998b) was developed to outline the investigations to be performed in areas eligible for further investigation under DERP-FUDS. These areas were investigated during the 1998 Phase I RI as outlined in the Work Plan. The data gathered during the Phase I field activities are presented in this report.

The components that were investigated during Phase I are as follows:

- Component 1 – CWM Chemical Services, Inc. (CWM) property
- Component 2 – Somerset Group property
- Component 3 – Town of Lewiston property
- Component 4 – Town of Porter property
- Component 5 – Niagara Falls Storage Site (NFSS)
- Component 6 – Modern Disposal Services, Inc. property
- Component 7 – Former LOOW Underground Lines
- Component 8 – Former Air Force Plant 68 (AFP-68) Underground Lines
- Component 9 – Surface Water Drainage on the Former LOOW

The locations of components 1-6 are illustrated on Figure 1.1-1. Each component contains one or more areas that were included in the investigation. These areas, with the exception of the underground lines and the surface water drainages, are illustrated in Figure 1.1-2. The

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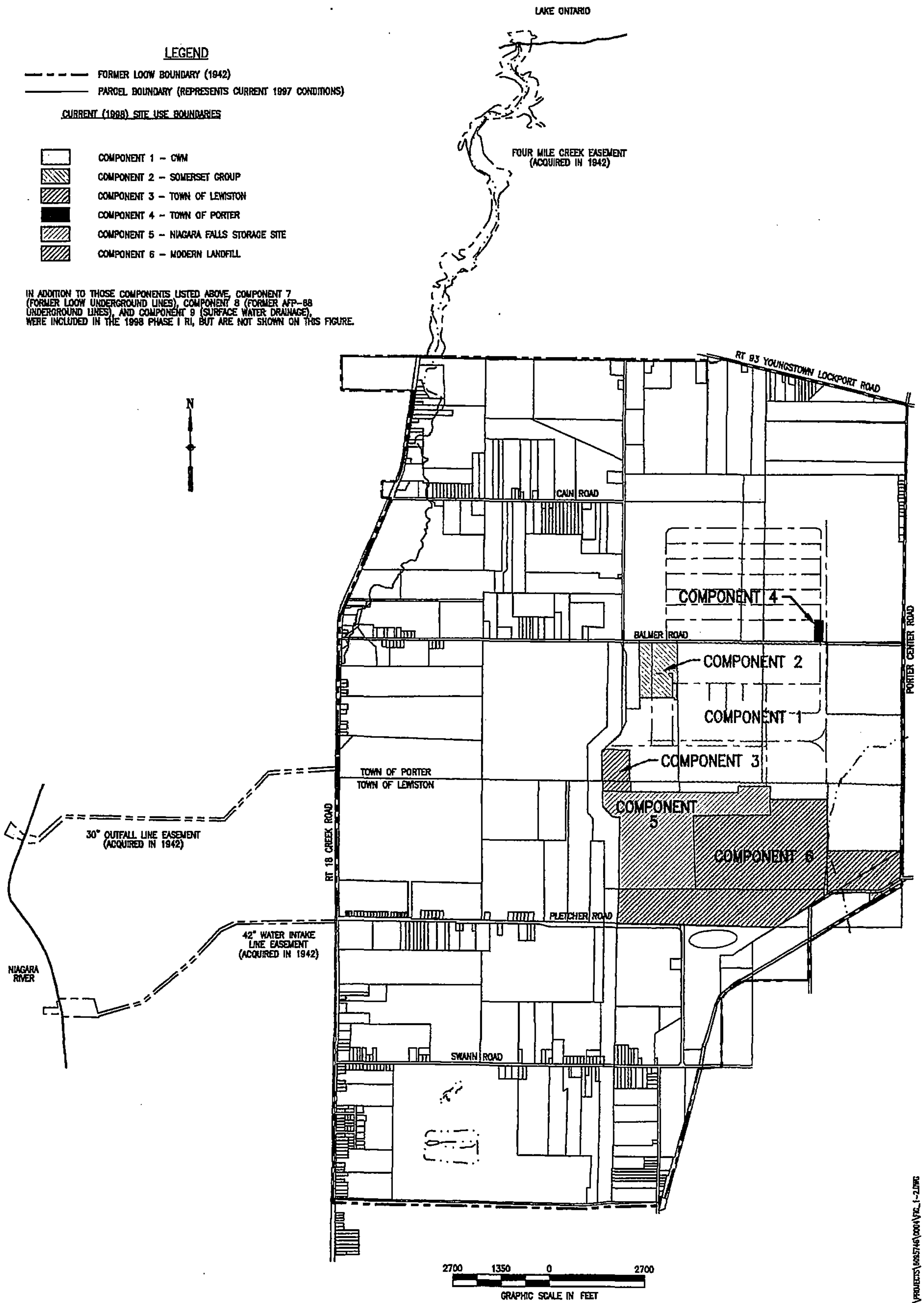


FIGURE 1.1-1 COMPONENTS INCLUDED FOR INVESTIGATION IN THE 1998 LOOW PHASE I RI

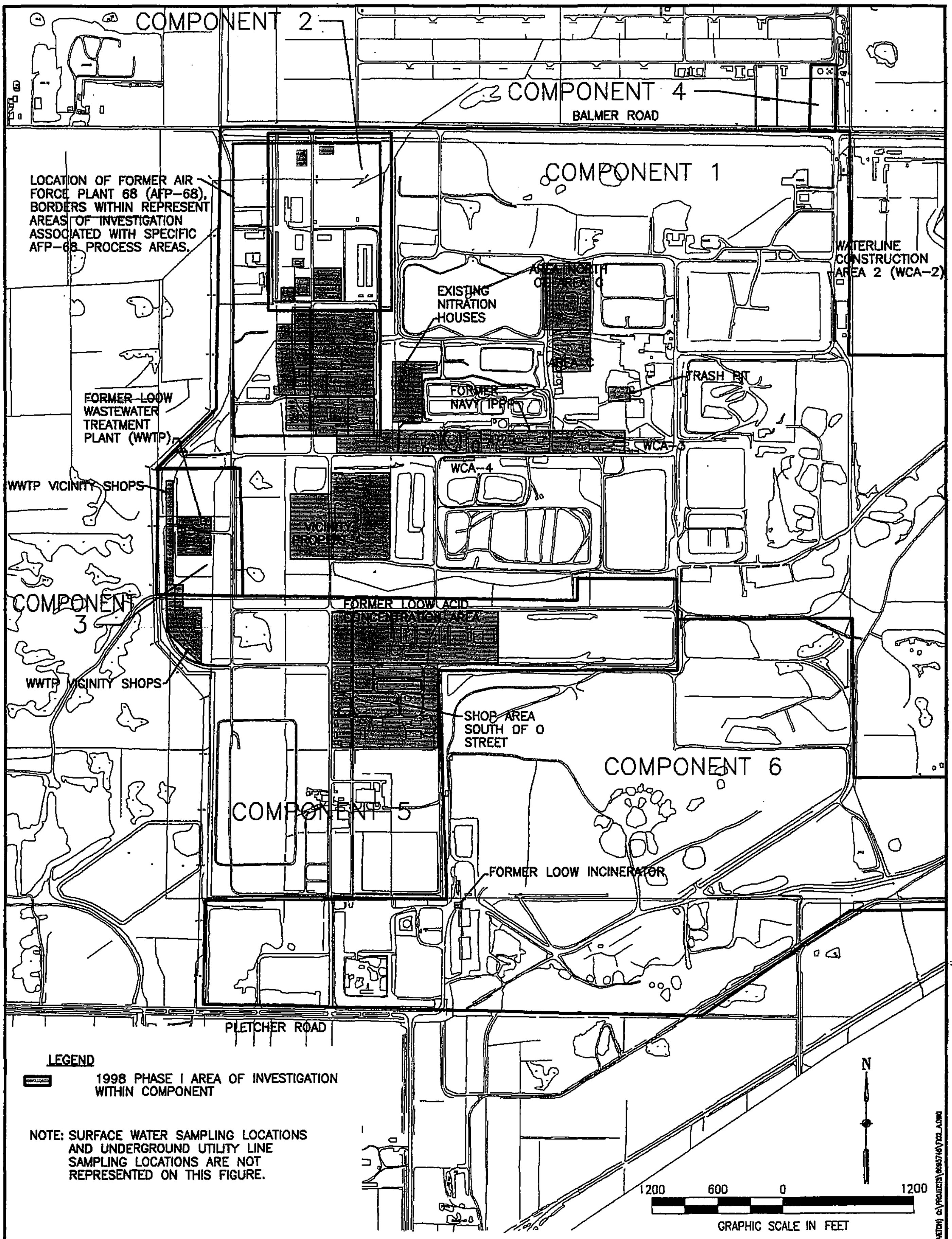


FIGURE 1.1–2 AREAS OF INVESTIGATION INCLUDED IN THE 1998 LOOW PHASE I RI FOR SOIL AND GROUND-WATER EVALUATION

underground lines are illustrated on Figure 11-1 and the Surface Water Drainages are illustrated on Figure 13-1. The components, sites within each component, and the rationales for inclusion of the site in the RI/FS are outlined in the Work Plan. Previous investigations at each component are also discussed in the Work Plan.

The areas investigated during the Phase I RI, and discussed in this report, represent those areas eligible for investigation under the DERP-FUDS program. Further review of the available historical data within the context of the eligibility parameters under a Hazardous, Toxic, and Radiological Waste (HTRW) project within the DERP-FUDS program, has lead to a review of the recommendations for some areas. The conclusion was drawn that some of the areas investigated during the Phase I are not eligible for investigation under a HTRW project. The conclusions and recommendations within this report for such areas will reflect this.

1.2 REPORT ORGANIZATION

This report includes the methods used, the data that were collected, and the conclusions based on those data for the Phase I RI at the former LOOW. The report is organized as follows:

- Chapter 1 – Introduction, includes the project objectives, report organization, a brief site description, and a description of other investigations that have been performed within the former LOOW.

- Chapter 2 – Physical Characteristics of the Study Area, includes information on the regional and local geology, lithology, surface hydrology, and hydrogeology. This discussion is focused on the conditions encountered during Phase I RI field activities.

- Chapter 3 – Field Investigative Procedures, describes the procedures used to obtain soil, ground-water, surface water, sediment, wastewater and sludge samples. Deviations from the Final Work Plan are also discussed.

- Chapter 4 – Data Comparison Criteria, presents the guidance criteria to which the analytical results are compared. These criteria include values provided within the regulations and background data collected during this Phase I RI and other investigations conducted at the former LOOW.

- Chapters 5 through 13 – Data Results and Evaluations for Components 1 through 9, presents the analytical data from samples collected during the Phase I RI field activities. The data are discussed in relation to appropriate criteria and background results. In addition, conclusions and recommendations for each site are presented.

- Appendices – The appendices include boring logs, field data, and analytical data tables for the Phase I RI.

1.3 SITE BACKGROUND

The history of the 7,500-acre former LOOW is documented in the *Final History Search Report for LOOW* (EA 1998a). A detailed description of previous investigations is included in the Work Plan (EA 1998b). General discussions of the history and previous investigations of the former LOOW are presented herein.

1.3.1 Site History

The former LOOW was a 7,500-acre parcel obtained by the War Department in 1942 for the production of trinitrotoluene (TNT). The TNT production, production support, and storage areas were constructed on approximately 2,500 acres. The remaining 5,000 acres were left undeveloped and acted primarily as a buffer zone. TNT production levels at several ordnance plants exceeded expectations, and LOOW was ordered to cease production in July 1943. The 2,500 acres encompassing the former production area were transferred to the U.S. Army Corps of Engineers (USACE)–North Atlantic Division in 1944. Since the 1940s, government and private landowners have used the property for various activities, including borane fuel plants, jet engine testing facilities, a NIKE missile facility, chemical and radioactive waste storage facilities, municipal and hazardous waste landfills, and testing of experimental communications equipment. The 5,000 undeveloped acres of the former LOOW were declared excess in 1945 and were transferred to the General Services Administration (GSA) for disposal to private landowners. Most of this property was not actively used by the former LOOW, and current uses include residential areas, small farms, churches, a conservation club, a trout hatchery, and other privately owned operations.

1.3.2 Previous Investigations

Due to the various private and government land uses of the former LOOW property, several investigations contain data from areas studied during this Phase I RI. Most of these investigations were performed by CWM, Modern Disposal Services, Inc., or the Town of Lewiston in conjunction with landfill operations and were not specific to activities associated with former DOD site use. However, the investigations provide important information regarding lithology, hydrogeology, and potential contaminant migration. In addition, several investigations of former DOD activities were conducted. The investigations pertinent to areas investigated in this Phase I RI are described in the Work Plan. The large number of investigations conducted within the former LOOW property makes it impractical to include all of the information in this report. However, the sections contained herein provide a description of some of the various investigations that have taken place within the former LOOW property, as well as a reference for the document describing the investigation.

U.S. Army Corps of Engineers (USACE) Investigations

The investigations outlined in this section were conducted for the USACE to characterize specific portions of the former LOOW property. Some of the specific areas cited in these reports were not included in this Phase I RI; however, the information in these reports applies to the overall evaluation of the former LOOW property.

- Ecology and Environment conducted surface water and sediment sampling in the vicinity of the drum burial area (Area A) and the Olin burn area (Area B) in 1985. The results of this investigation are summarized in the Acres 1989 Final RI Report (Acres 1989).

- A field reconnaissance of selected areas was performed by Acres in 1988 (Acres 1988). Observations were recorded at the former AFP-68, the former LOOW nitration houses, the wastewater treatment plant (WWTP), and the NIKE Missile Base.

- A document and background information search regarding DOD activities on the former LOOW was performed by Acres in 1989 (Acres 1989b). The report contained information regarding the Areas A and B, the location of magnetic anomalies, and analytical data from surface water and soil samples.

- Investigations of Component 1 (Areas A, B, C, and North of C, as well as the TNT waste line and acid waste lines) were performed by Acres during an initial RI (Acres 1989) and a supplemental RI (Acres 1990) for the USACE–Kansas City District. The study included ground-water sampling, soil sampling, drum sampling, underground line sampling, and geophysical investigations.

- The former AFP-68 property was investigated by Golder for CWM (Golder 1991). The investigation included collection of soil, ground-water, and sludge samples from the acid neutralization lagoon, oil/water separator, and chemical waste lift station areas in the southern portion of the former AFP-68. Acres also investigated the former AFP-68 in a Preliminary Contaminant Assessment (PCA) of the entire AFP-68 (Acres 1992). During the PCA, soil, ground-water, sludge, and sewage samples were collected from potential sources within AFP-68, the WWTP, and the former NIKE Missile Base.

- A data search summary report, which summarized historical data associated with areas potentially impacted by DOD activity in Operable Unit 2 (Component 1, Component 2) was conducted by Acres in 1993 (Acres 1993).

- An engineering evaluation and cost analysis (EE/CA) for removal of the TNT waste lines, buried drums in area A, burn pit in Area B, asbestos in Component 2, and miscellaneous containers was performed by Acres in 1995 (Acres 1995). The associated remedial design investigation and remedial design were also conducted (Weston 1997a, Weston 1997b). During the remedial design investigation, additional soil, sludge, and sewage samples were collected.

U.S. Department of Energy (USDOE) Investigations

Following the dismantling of TNT production facilities, portions of the former LOOW were used for storage of radioactive waste. Properties in the vicinity of the NFSS, but not under ownership of the DOE were investigated and remediated between 1983 and 1986. The waste from these remedial activities was consolidated into an interim waste containment structure on the 191-acre parcel designated as the Niagara Falls Storage Site (NFSS). The U.S. Department of Energy was responsible for the investigation and remediation of the sites under the Formerly Used Sites Remedial Action Program (FUSRAP). Numerous documents are available that describe these investigations and remediation. Several of the more relevant reports to this Phase I RI are listed herein.

- Drums associated with USDOE activity were excavated from Vicinity Property G, on CWM property, in the 1980s. A report was issued describing the investigation and analysis of drum contents (USDOE 1987).

- Several radiological investigations have been performed by the USDOE in reference to the NFSS. A comprehensive characterization and hazard assessment of the NFSS was conducted by Battelle in 1981 (Battelle 1981). Environmental monitoring reports have subsequently been issued each year since the early 1980s (for example, Bechtel 1985 and Bechtel 1986).

- A Certification Docket for the remedial action performed at the NFSS Vicinity Properties (1983-1986) was issued by the USDOE in 1992 (Bechtel 1992).

<u>CWM Investigations</u>

- CWM has conducted several investigations that contain information from areas within or adjacent to areas investigated during this RI. The RCRA Facility Investigation (RFI) contains data associated with the southern portion of AFP-68, former West Drum Area (south of the nitration houses), Piezometer P12-2S (west of the Area North of C), and the PCB warehouse (former LOOW box factory) (Golder 1993b).

- CWM conducted a survey of PCB concentrations in surface soil and sediment. Some of these sampling locations were within AFP-68 and in the vicinity of other areas investigated during this RI (CWM 1990).

- Golder conducted an extensive hydrogeologic characterization, including the determination of hydraulic conductivities, vertical gradients, and grain size distributions, of the portion of LOOW currently owned by CWM (Golder 1985). A hydrogeologic update was also performed by Golder for CWM (Golder 1993).

- In addition to the investigations mentioned above, CWM has performed various ground-water evaluations, corrective measures, well construction comparisons, sampling technique comparisons, and background concentration evaluations.

Modern Disposal Services, Inc.

- Hydrogeologic investigations were performed for Modern Disposal Services, Inc. by Wehran (Wehran 1990).

2. PHYSICAL CHARACTERISTICS OF THE STUDY AREA

Sections describing and detailing the physiographic setting, geology of deeper units, and climate are included in the Final Work Plan. Subsections below include discussions of site stratigraphy, hydrology, and hydrogeology. Field observations from the Phase I RI form the basis for the following discussions, and they are supplemented by site descriptions from previous investigations. Component-specific variations from generalized conditions are presented in each of the appropriate subsections (per component) in Chapters 5 through 13.

2.1 STRATIGRAPHY

Numerous hydrogeologic investigations have been conducted on CWM, Modern Landfill, and NFSS properties. Prior to the current RI, more than 400 test borings and test pits for monitoring wells, piezometers, exploratory borings, and foundation borings were performed throughout the former LOOW. During this Phase I RI, approximately 550 additional borings were installed.

The subsurface information obtained from these investigations indicates that the former LOOW is underlain by 30 to 60 ft of unconsolidated glacial deposits. A generalized stratigraphic cross-section of the former LOOW is shown in Figure 2.1-1. These deposits unconformably overlay the shale bedrock of the Queenston Formation. The ascending stratigraphic order is:

- Bedrock
- Lodgement till
- Glaciolacustrine silt and sand
- Glaciolacustrine clay (GLC)
- Middle silt till (MST)
- Upper glacial till sequence [Upper Clay Till (UCT) and Upper Silt Till (UST)]
- Recent alluvium

Soil borings installed during this Phase I RI did not exceed 20 ft below ground surface (bgs). Samples were generally collected from the alluvium, fill, or upper glacial till layers, depending on site sampling rationale. Occasionally, the GLC was sampled when the contact between the UCT and GLC was overshot. Borings generally did not penetrate the GLC, except in two adjacent borings in the Vicinity Shops (Component 3) area, in which the MST was encountered below a thin GLC layer, in the westernmost portion of the active former LOOW.

The following is a brief description of the stratigraphic units encountered to date at the former LOOW during this Phase I RI and during previous investigations.

Glaciolacustrine Clay

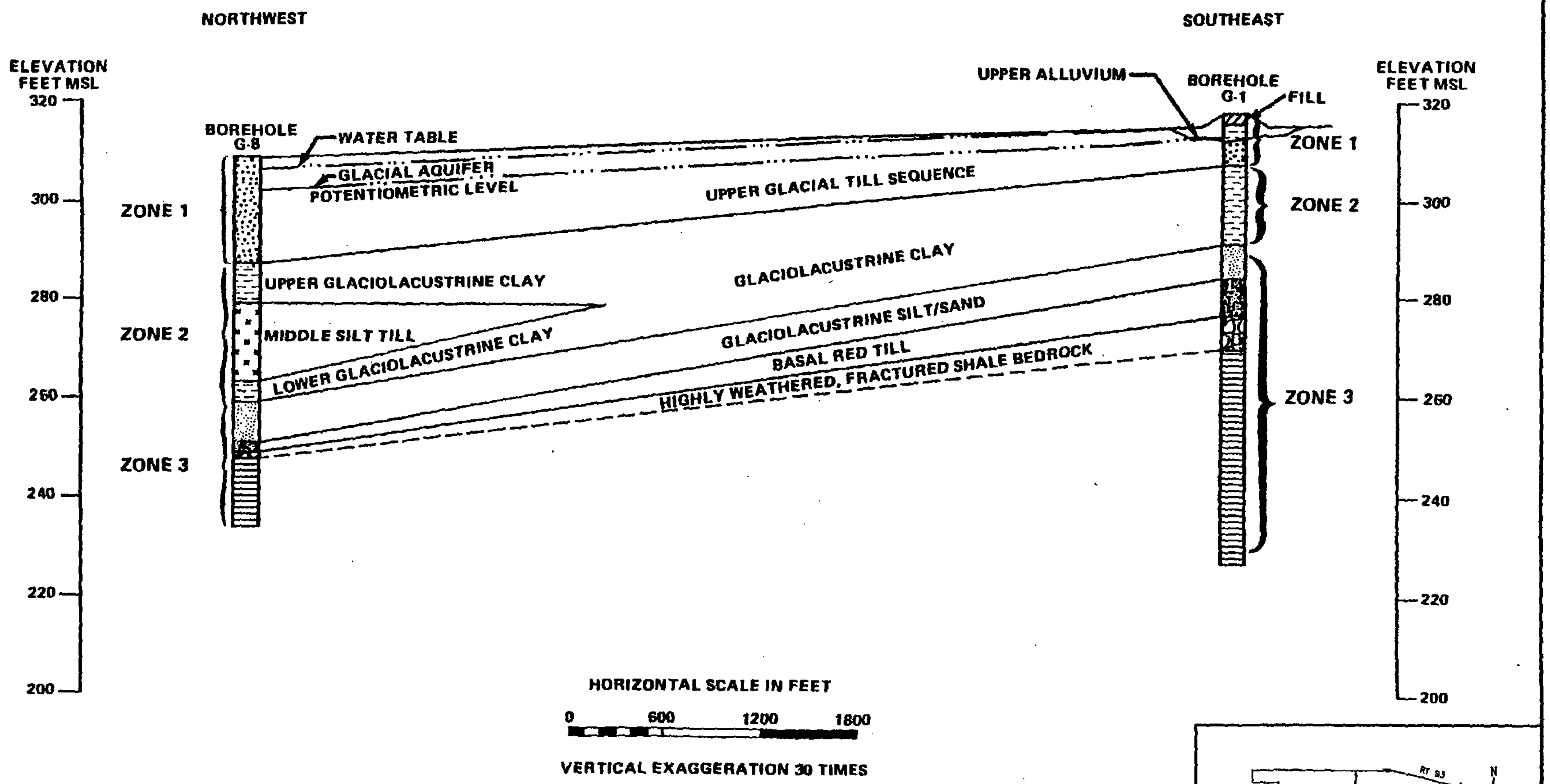
The GLC unit typically overlies the glaciolacustrine silt/sand unit. The GLC is typically composed of laminated, very soft to firm, gray to gray brown silty clay (designated as CL and CL-ML by the Unified Soil Classification System [USCS]) with traces of fine sand. Laminations may occur as thin red-brown to gray silt and fine sand layers that are most frequent near the base of the unit. The GLC is of low to medium plasticity with an average plasticity index of 16. The majority of the unit has a high natural moisture content, averaging about 28 percent.

The GLC unit attains a thickness of up to 25 ft in the southwestern portion of the active area of the former LOOW. In the northwestern portion of the current CWM facility, formerly a part of LOOW, the GLC unit is divided by the middle silt till (MST) deposit. In this area, the two strata of clay are identified as the upper and lower GLC units. The upper GLC unit ranges up to 10 ft in thickness. The lower GLC unit ranges up to 6 ft in thickness. The two clay strata are discontinuous and may be absent in some areas.

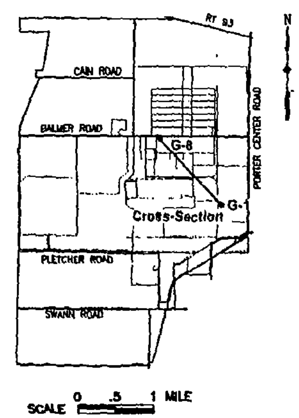
The GLC was frequently encountered during this Phase I RI at depths ranging from 10 to 20 ft bgs. Borings were terminated when the GLC unit was encountered. However, the MST layer was encountered in some borings in the Vicinity Shops area (Component 3), where the upper GLC layer was less than 2 ft thick.

Middle Silt Till Unit

The Middle Silt Till (MST) unit divides the GLC unit into the Upper and Lower GLC units. Previous investigations indicated that this layer is present only in western and northwestern portions of the current CWM property. This MST unit is composed of well graded, compact to very dense, gray to gray-brown silt and coarse to fine sand with a trace of fine gravel.



Note: This cross-section represents the lithology encountered during drilling of boreholes at G-1 and G-8



LOOW LOCATION MAP

Source: Adapted from Golder (1985)

Figure 2.1-1. Typical Cross-Section of Former LOOW.

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Upper Glacial Till Sequence

A sequence of glacial tills overlies the GLC unit. This sequence can be frequently divided into two strata: an Upper Silt Till (UST) unit and an Upper Clay Till (UCT) unit, which are collectively shown on Figure 2.1-1 as the Upper Glacial Till Sequence. Most of the subsurface samples collected during the RI were collected from this sequence.

The Upper Clay Till (UCT) unit is commonly composed of non-stratified to faintly laminated, stiff to hard, moderate brown (designated as 5 YR 4/4 by the Geological Society of America Munsell® color chart) to purple-brown (5 YR 4/1) silty clay (CL to CL-ML) with some fine to coarse sand and little fine gravel. This deposit occasionally contains cobbles and discontinuous, wet sand, gravel, and silt layers (less than 6 in. in thickness). The laminations are gray, red, or brown silt, with a trace of fine sand and fine gravel and are more frequent toward the top of the UCT layer. However, the silt, sand, and gravel lenses tend to thicken toward the bottom of the unit. When the silt, sand, or gravel lenses widen to 0.5 to 4 ft in thickness, the layer may be classified as Upper Silt Till (UST). The UCT is generally dry, but with increasing moisture content in the vicinity of a wet unit (such as the UST or GLC), or an occasional wet sand or gravel lens. The unit exhibits low to medium plasticity, with an average plasticity of 13 and an average moisture content of 15 percent. The UCT frequently transitions directly into the GLC, with the designations based on plasticity, moisture, and softness; distinct color changes are more difficult to distinguish, due to smearing of the clay within the direct push sample liners. However, contacts are occasionally marked by a thin gravel or coarse sand layer (less than 3 in.) between the two units.

The UST unit is generally encountered near the bottom of the Upper Glacial Till, either at the contact between the GLC and UCT, or interbedded within the UCT. This unit is typically composed of compact to very dense, brown (5 YR 4/4) to purple-brown (5 YR 4/1) silt, and/or coarse to fine sand with little fine gravel (SM/ML). Wet, discontinuous layers of silt and sand are occasionally found within the unit. The unit is generally non-plastic. The UST unit was reported at thicknesses up to 4 ft during this Phase I RI.

The thickness of the Upper Glacial Till across the former LOOW varies from 10 to 20 ft. The units become thinner toward the southern portion of the facility, averaging 10 to 15 ft. The differentiation of the UST and the UCT has not been made in all previous site investigations.

Generally, the target unit for collection of deep samples during this Phase I RI was the UST, which has a higher water content than the UCT, and therefore has a higher potential for contaminant transport. However, due to the discontinuous nature of the UST, most subsurface samples were collected from the UCT. A site-specific delineation of the UST unit (as encountered at each component) is presented in a discussion of subsurface conditions for each of the Component areas at which subsurface sampling was performed (Chapters 5 through 13).

Recent Alluvium

Alluvium is found discontinuously across the facility. This unit is typically laminated and varies from fine sand with some silt to a silt or silty clay (SM, ML, or CL). This layer may occur in thicknesses of up to 5 ft. However, due to substantial grading and re-grading of the site, the alluvium layer is frequently absent.

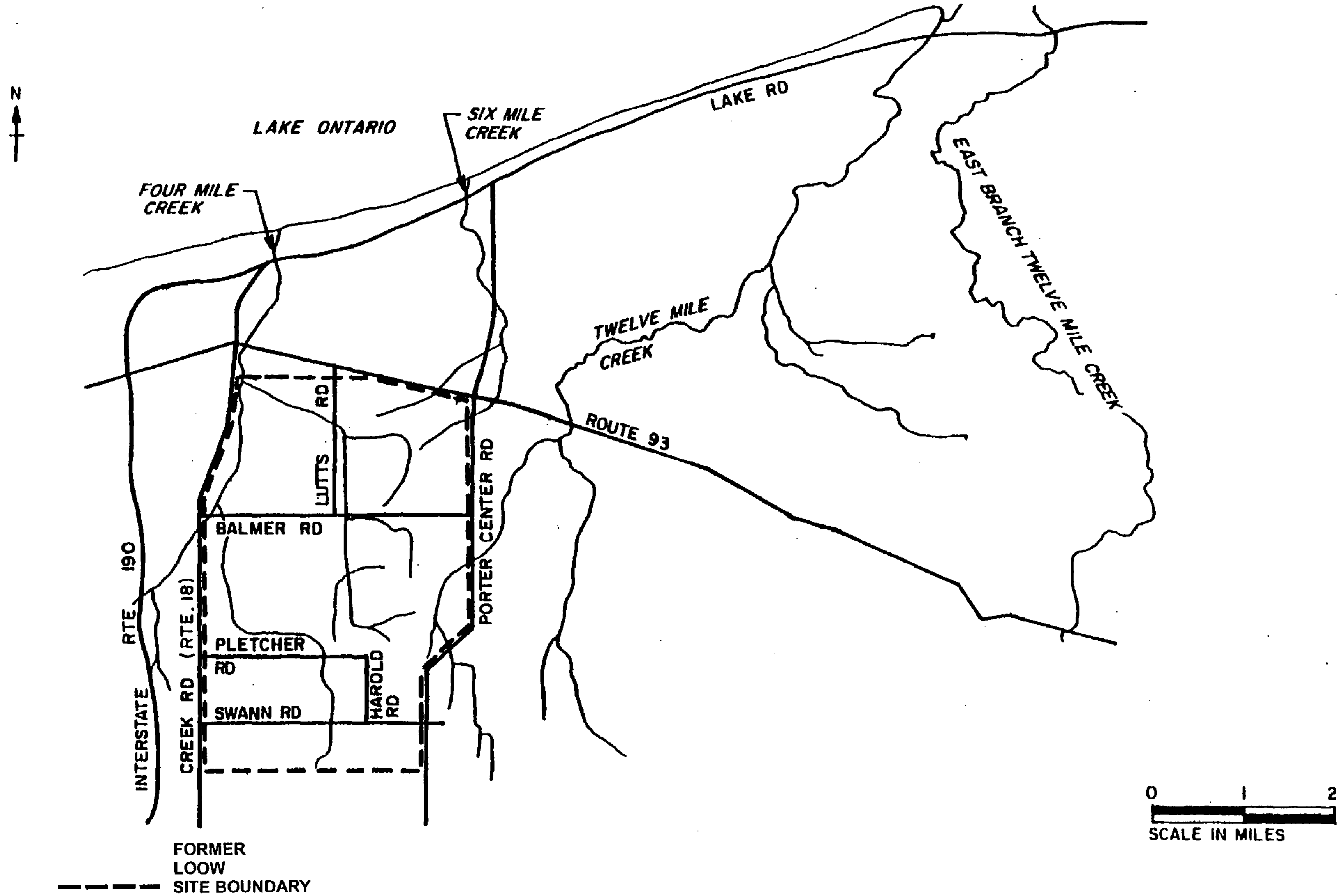
Fill

Because the former LOOW has been used for various purposes, including the original agricultural activities prior to the construction of the LOOW and subsequent landfilling and building construction activities, the natural topography and composition of the surface and near surface soil has been substantially altered. In addition to the obvious landfills and buildings constructed on the former LOOW, some areas have received "borrow material" which was either brought into the site or moved from one area of the site to another. Because much of this "borrow material" is locally derived, it is commonly of similar composition to the native deposits and may only be distinguishable by signs of disturbance or inclusion of foreign material such as wood, metal, etc.

It is assumed that surface soil collected from most of the areas included in this Phase I RI are either fill material or have been severely re-graded during previous site activities. During this Phase I RI, fill was most frequently encountered along roads, and adjacent to CWM or former LOOW structures. Fill was encountered to depths of up to 8 to 12 ft at some locations.

2.2 SURFACE HYDROLOGY AND DRAINAGE

Surface drainage patterns in the area of the former LOOW site are presented in Figure 2.2-1. Current surface water drainage patterns within former LOOW boundaries are shown on Figure 2.2-2. Four Mile, Six Mile, and Twelve Mile creeks receive natural surface runoff,



Source: Adapted from Acres (1989b)

Figure 2.2-1. Regional Surface Water Drainage.

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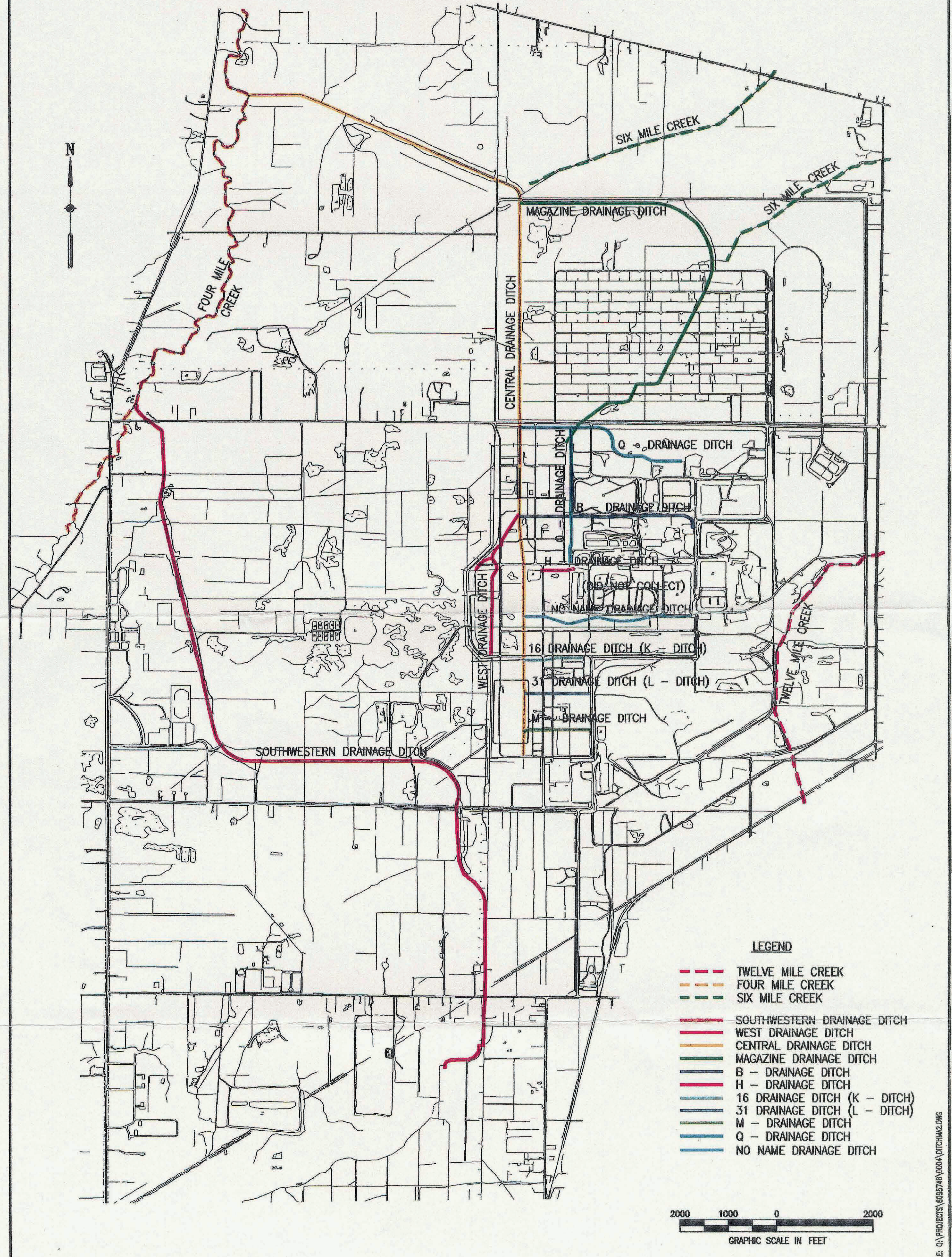

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	LOOW SURFACE WATER DRAINAGES

PROJECT MGR.	DESIGNED BY	DRAWN BY	CHECKED BY	DATE	SCALE	PROJECT NO.	FILE NAME	DRAWING NO.	FIGURE
HGP	DAB	FDV	SMS	MAY 1999	AS SHOWN	60957.46	DITCHMAP	-	2.2-2

agricultural drainage, and treated and institutional waste discharges before flowing northward and emptying into Lake Ontario. Major sections of these streams are intermittent. Where Four Mile and Twelve Mile creeks flow into Lake Ontario, the creeks are designated as recreational areas with public swimming sites.

The New York State descriptions of the best usage of fresh water are as follows:

- Class B is suitable for primary/secondary recreational contact and other uses, except as a source of water supply for drinking, culinary, or food processing purposes.

- Class C is suitable for fishing, primary/secondary recreational contact, and other uses, except as a source of water supply for drinking, culinary, or food processing purposes. The best use is fishing.

Four Mile Creek is classified as a New York State Class B water body from its mouth at Lake Ontario to 0.9 mile upstream (located 0.3 mile southeast of the intersection of Lake Road and Creek Road). The remaining section of Four Mile Creek is listed as a Class C water body.

Six Mile Creek as been identified as a Class C water body along its entire length.

Twelve Mile Creek is classified as a Class B water body from its mouth at Lake Ontario to the NY Route 18 bridge. Twelve Mile Creek is a Class C water body from the NY Route 18 bridge to 1.3 miles upstream. The remaining upstream section is classified as Class C.

As part of the former LOOW site operations in the 1940s, a system of ditches was constructed to drain surface waters from the site to the Central Drainage Ditch (Figure 2.2-2). It is possible that these ditches receive ground-water discharge. The section of Six Mile Creek that originally flowed through the site was diverted to the Southwestern Drainage Ditch and Four Mile Creek. Drainage from the southwestern portion of the site that once flowed eastward into Twelve Mile Creek was diverted to the S-31 ditch. Several additional ditches at the site drain into the Central Drainage Ditch, which ultimately discharges into Four Mile Creek. The Central Drainage Ditch is a channelized ditch measuring approximately 10 to 15 ft deep, 10 to 20 ft wide at the bottom, and 40 to 50 ft wide at the surface. The ditch is approximately 3 miles in length.

2.3 REGIONAL HYDROGEOLOGY

Unconsolidated Materials

Ground-water occurrence within the unconsolidated overburden in the LOOW area is primarily controlled regionally by the type and occurrence of glacial deposits and locally by fluvial deposits. Past investigations in the former LOOW area indicate that glacial deposits range from 30 to 60 ft in thickness. Permeabilities of these glacial deposits vary from low permeability ground moraines and glacial lake deposits to highly permeable sand and gravel outwash deposits. Interspersed throughout the glacial deposits in the LOOW area are fluvial stream and beach deposits, which generally have high permeabilities but are typically of limited areal extent.

Ground-water flow within the unconsolidated deposits generally conforms to the local topography, with overall flow generally toward Lake Ontario to the north and the Niagara River to the west.

The subsurface of the former LOOW has been divided into three hydrostratigraphic units. These units are identified as:

- Zone 1—Consists of the unconfined water-bearing zone within the UST, alluvium, and fill units.

- Zone 2—Consists of the moist, but relatively impermeable, GLC unit.

- Zone 3—Consists of a confined water-bearing zone occurring predominantly within the glaciolacustrine silt/sand unit and, to a lesser degree, within the basal red till and upper portion of bedrock.

The hydraulic conductivities (permeabilities) of the geologic formations are summarized in Table 2.3-1. The glaciolacustrine silt/sand unit (part of Zone 3) is the most permeable formation and, as such, is the primary aquifer being monitored by CWM.

TABLE 2.3-1 HYDRAULIC CONDUCTIVITIES OF STRATIGRAPHIC UNITS AT THE FORMER LOOW*

Zone	Stratigraphic Unit	Hydraulic Conductivity (ft/day)	
		Vertical	Horizontal
1	Upper Clay Till Upper Silt Till	2×10^{-3}	6×10^{-3}
	Middle Silt Till	3×10^{-4}	9×10^{-3}
2	Glaciolacustrine Clay	6×10^{-5}	1×10^{-4}
3	Glaciolacustrine Silt/Sand		
	· Stratified Coarse Sand		6×10^{-1}
	· Non-Stratified Silt and Fine Sand		9×10^{-2}
	· Stratified Silt and Fine Sand		3×10^{-2}
	· Interlayered Silt Sand and Clay		9×10^{-3}
	Basal Red Till	9×10^{-5}	1×10^{-4}

* Hydraulic permeabilities calculated by Golder (1987).

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Water within the Queenston Formation is moderately to highly mineralized. The total dissolved solids (TDS) concentration within the water averages 2,600 ppm (parts per million) and ranges between 533 and 8,920 ppm. The higher levels of TDS are largely attributed to elevated levels of sodium, calcium, and chlorides in connate water within the formation (Johnston 1964).

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3. FIELD INVESTIGATIVE PROCEDURES

This chapter presents an overview of the analytical methods and field investigative procedures used during the Phase I RI at the former LOOW. The field investigation included sample collection, field screening of soil samples using on-site immunoassay and gas chromatography (GC) analyses, trenching to delineate former trash and drum burial areas, and site surveying. Sampling activities included collection of surface, semi-subsurface, and subsurface soil, ground-water, surface water, sediment, wastewater, and sludge samples. Soil, sediment, sludge, ground-water, and surface water samples were submitted for laboratory analyses.

3.1 FIELD SCREENING METHODS

Field screening analyses of soil samples were generally conducted in accordance with the Standard Operating Procedures (SOPs) outlined in the Work Plan. Deviations from the immunoassay analysis SOP occurred at the direction of the manufacturer as described in Section 3.1.1.

Soil, sediment, and sludge samples for screening analysis were analyzed for either full suite parameters or DOD marker compounds, depending on the area of investigation. Full suite screening analysis included an abbreviated suite of volatile organic compounds (VOCs), total polycyclic aromatic hydrocarbons (PAHs), total polychlorinated biphenyls (PCB), and TNT. Field screening for DOD marker compounds consisted of TNT analysis only. Soil samples collected from Component 2 (Somerset Group property), Temporary Building 1 and 2 (in the northwest corner of the property) were also screened for chromium using an X-Ray Fluorescence (XRF) analyzer.

3.1.1 Immunoassay Analyses

Samples were field screened for PAHs, PCB, and TNT using Ohmicron RPA-I RaPID Analyzer™ spectrophotometers. The method detection limits using this field screening method are 200 parts per billion (ppb), 500 ppb, and 250 ppb for PAHs, PCB, and TNT, respectively. These field screening analyses correspond to EPA methods SW846 4050, 4035, and 4020 for analysis of TNT, PAH, and PCB, respectively. The method detection limits for each of the analyses are discussed within the EPA methodology.

Soil, sediment, and sludge samples were weighed in disposable tins, placed in laboratory ovens, and dried overnight at 65 °C. The dried samples were then weighed, and the percent moisture of the samples was calculated. Samples were then crushed using a mortar and pestle. After which, a methanol extraction solution was added to a ten gram (± 0.1 g) sample aliquot.

It should be noted that up until June 15, 1998, samples were extracted and filtered as per the SOP listed in the Work Plan. After this date, the manufacturer changed the methodology and a new methodology was implemented as part of the immunoassay protocol. In the original SOP, after addition of the methanol, the samples were vigorously shaken for 1 minute and allowed to settle for 5 minutes, than filtered into a vial. In the amended protocol the samples were shaken for 1 minute and allowed to settle for 5 minutes. After which, the clear extractant over the settling soil was siphoned off, placed in a test tube and filtered into a vial for storage. The holding time on the extracted samples was seven days.

After filtration the filtered extractants were added to diluents (a single filtered extractant could be used for all three analyses). The standards, control, and diluents were added to empty test tubes. The test tube rack could accommodate either 46 samples and 5 duplicates of a single analyte, where each analyte was run separately, or it could accommodate 10 samples and 1 duplicate of the three analytes to be run simultaneously. The first option was more economical, because it conserved the standard solutions and it proved to reduce the chance for error.

After the appropriate amount of standards, controls, and samples were added to the test tubes, the reagents were added and procedures were followed according to the SOP included in the Work Plan. After a final 20-minute incubation period, stopping solution was added, and the results were read at a 450 nanometers (nm) wavelength within 15 minutes of stopping the reaction.

The spectrophotometer created a printout with calibrator data, a calibration curve, control data, and sample data. If calibrator data or the calibration curve did not fall within certain values, the data would be approved for use by the vendor/manufacturer. The manufacturer had developed data for the average ranges of standard responses which could produce accurate sample results even though the standard run may have been outside the 0.99 correlation and 10% coefficient of variation tolerance. This accumulated data from the manufacturer is currently unpublished, and therefore, was accessed through consultation with the manufacturer.

An absorbence and concentration are given for each sample number. To find the actual concentration, the number was multiplied by the dilution factor. Under normal situations, the dilution factor was 100, 2000, and 1000 for PAH, PCB, and TNT, respectively. If the results for the samples were high (i.e., 2 to 50 ppm for PAH, 50 to 1000 ppm for PCB, and 12.5 to 250 ppm for TNT) an additional dilution was made for more accurate results.

At various points in the analysis process, data were recorded on a Laboratory Analysis Log. This log included: sample number, wet and dry weights for the percent moisture calculation, analyte and lot number, extraction date and time, weight of soil sample, dilution factor, test tube number (to assist with sample tracking), starting and ending times for the first and second incubations, the date and time analyzed, the analyzer reading, and the actual concentration in ppb. This information was recorded for all analyzed samples and for the control samples.

3.1.2 Gas Chromatography (GC) Analysis

Soil, sludge, and sediment samples from each area of investigation were field screened for VOCs using either a Varian 3300 GC equipped with a flame ionization detector (FID) and an electron capture detector (ECD). Due to the large number of samples collected, an additional GC was mobilized to perform field screening. Because a second Varian GC was not available, a Photovac 10 Plus GC equipped with a photoionization detector (PID) with a 10.6 eV lamp was used. VOC field screening parameters included BTEX (benzene, toluene, ethylbenzene, *meta-* & *para*-xylenes, and *ortho*-xylene), trichloroethene (TCE), perchloroethene (PCE), 1,1,1-trichloroethane (TCA), *cis-* and *trans*-1,2 dichloroethene (DCE), 1,1-dichloroethene (1,1-DCE), and carbon tetrachloride. This set of analytes was chosen because it represents a common mix of volatile compounds and associated degradation products that would be expected from site activities at the former LOOW and fuels plants. Samples were analyzed within 48 hrs of collection.

Sample analysis using the Varian GC was performed as per the SOP for GC Analysis Using a Mobile Laboratory as discussed in Appendix D of the Work Plan. For the Photovac GC, a 10-g sample was placed in a dedicated 40 milliliter (mL) vial, to which 20 mL of deionized water was added, leaving a headspace above the soil/water slurry. The vial was capped with a lid containing a Teflon septa, and vigorously agitated for 1 minute. After agitation, the aqueous and vapor phase concentrations were left to equilibrate for a minimum of one hour. Following equilibration, an aliquot of the headspace was injected into the GC for analysis.

Standards containing each of the analytes were analyzed twice each day. In addition, field blanks were analyzed to evaluate the cleanliness of the deionized water, sample vials, syringes, and GC column. Ten percent of the samples were reanalyzed as instrument duplicates to evaluate reproducibility of sample results. A subset of samples was also submitted for confirmatory laboratory analysis to evaluate the comparability of field screening and lab data.

3.1.3 X-Ray Fluorescence Analysis

Results from previous reconnaissance and investigation at Temporary Buildings 1 and 2 on Component 2 indicated that liquid (apparently chromic acid) was stored in glass bottles on the foundation of one of the buildings. Due to the possibility of leakage from the bottles, screening of soil samples for chromium, using XRF, was performed during the Phase I investigation. Samples were screened for chromium using a Niton XL XRF, in accordance with the SOP in the Work Plan. The basis of XRF spectrometry is the detection and measurement of x-rays emitted from the atoms of an irradiated sample. A beam of x-rays is directed into a sample, exciting some of the atoms to energy levels exceeding their ground state. In this unstable atomic state, a vacancy exists in one of the lower energy level electron orbitals. Electrons from higher energy states fill these vacancies in the lower energy levels, releasing energy in the process. Some of the energy is emitted as x-rays with energies characteristic of their element of origin. The Niton XRF can directly detect elements by their K shell, and/or L shell x-ray fluorescence.

Soil samples were dried, ground, and passed through an ASTM No. 60 sieve prior to analysis. A plastic Niton XRF sample canister was filled with the sifted soil, covered with Mylar film, and secured with a plastic collar. The sample was placed in the XRF analyzer and exposed to the irradiating source for 60 seconds before a reading was recorded.

3.2 SURFACE, SEMI-SURFACE, AND SUBSURFACE SOIL SAMPLING

3.2.1 Soil Sampling From Established Sampling Locations

Soil sample locations were established in a grid pattern at most areas, as described in the Work Plan. Grid intervals of 25 ft, 100 ft, and 200 ft were used, depending on the size of the area of investigation. Grid points were given alpha-numeric designations. The east-west trending lines were given alphabetic designations, starting with "A" as the southern-most grid line within each area. The north-south trending lines were given numeric designations, based on the distance (in feet), from the western-most grid line, the "0" line of the grid. This designation standard established A0 as the southwest corner of each sampling grid within each area. Samples collected from within established site grids were designated with the component number, followed by the two-digit area identifier, the two-digit matrix code, the grid point location, and the beginning depth of the sample interval (for soil). For example, C1-NH-SO-B100-0.5 was a soil sample collected from a depth of 0.5 to 1 ft, from grid location B100 in the nitration house investigation area within Component 1 (CWM). In those instances where grid sampling locations were shifted, the sample designations reflect the distance and direction of the shift. For example, C1-NH-SO-B(+10)190 was shifted 10 ft north of the B line and was only 190 east of the 0 line, rather than the proposed 200 ft. In some areas (i.e., the 30-in. outfall line, waterline construction areas, WWTP, and biased points within grids), biased sampling locations were established adjacent to structures where chemicals may have been used or the possibility of a release is present. When warranted, biased points were sampled based on field observations of stressed vegetation, stained soil, drain outlets, and/or historical information. In these instances a sequential number was assigned, rather than a grid location, when establishing sample designations. Figures showing sample grids and bias point locations are included in area-specific discussions in Chapters 5 through 13.

Direct-push methodology was used to collect surface, semi-subsurface (if necessary), and subsurface soil samples from each accessible sampling location. During drilling, boring logs were completed at each location. A full lithologic description was recorded for several borings. Once the subsurface characteristics of the area were ascertained, the samplers were drilled directly to the estimated sampling locations. Drilling then continued from that point, until the appropriate conditions were observed for sample collection. Descriptions of the soil samples were recorded only at the sampling intervals. The boring logs are included in Appendix A of this report.

Surface soil samples were generally collected between 0 and 0.5 ft bgs, except in areas where road beds or building foundation material were encountered, in which case the sample was collected below that material. Semi-subsurface samples were collected from areas within the former AFP-68, typically from a depth of 1 to 4 ft bgs. This sample was intended to represent the top of the soil that was left undisturbed during the construction of AFP-68. Subsurface samples were generally collected from the highest saturated zone encountered; this was either the perched slurry zone (4 to 8 ft bgs) or the deeper sand/silt/gravel zone, which was also thinner and discontinuous. If no wet or saturated layers were encountered, the sample was generally collected from the contact between the UCT and GLC (approximately 12 to 14 ft bgs). Soil sampling intervals were generally 0.5 ft, unless otherwise noted.

Soil samples were collected in accordance with the SOP for Soil Sampling in Appendix D of the Work Plan, with the exception of the following deviations. Dedicated polyethylene core liners were used to retrieve soil samples with the direct push rig. The sample interval selected for field screening remained in the liner, which was capped, bagged, placed on ice, and returned to the field laboratory for appropriate screening analyses. For samples submitted for laboratory analysis, the liner was cut to expose the soil and an EnCore™ Sampler was used to collect a soil sample aliquot for laboratory analysis of VOCs. For other laboratory analytical parameters, the remaining soil was homogenized in a stainless steel bowl, placed into appropriate soil sampling jars, and iced for preservation as per Table 3.2-1.

Soil samples were also field screened for total organic vapors using a PID and for radionuclides using radiation survey meters capable of detecting alpha, beta, and gamma radioactivity. These values were recorded on the boring log associated with each sampling location.

Five percent of surface, semi-surface, and subsurface soil samples were submitted for laboratory confirmation of field-screening analyses. If the area of investigation contained only a few sampling locations, a minimum of one sample was submitted for laboratory analysis regardless of whether the extra sample exceeded the five percent goal. Generally, samples were chosen for laboratory analysis based on elevated field screening results, or the need for confirmatory samples for a specific analyte, such as TNT. Samples screened for full-suite parameters were submitted for the following laboratory analyses:

- Target Compound List (TCL) analytes – VOCs, semi-volatile organic compounds [SVOCs], pesticides, and PCB. To achieve lower detection levels, a separate method was used to analyze for pentachlorophenol (PCP) and PAHs.

- Target Analyte List (TAL) analytes – metals and cyanide

- DOD marker analytes – explosives, boron, and lithium.

Samples screened for DOD marker compounds were submitted for laboratory analysis of boron, lithium, and explosives (see Section 3.6 and Table 3.6-1).

Table 3.2-1 Containers, Preservation Technique, and Holding Times for Solid Samples Collected at the Former LOOW, Niagara County, NY, Phase I RI

Parameter	Container[b]	Preservative	Holding Time[a]
Inorganics			
Cyanide	Glass	Cool, 4 C	14 days
Metals, total			
Mercury	Glass	Cool, 4 C	28 days
Metals, other	Glass	Cool, 4 C	6 months
Organics			
Pesticides/PCBs	Glass, teflon-lined cap	Cool, 4C	14 days to extraction; 40 days for analysis
Organics, includes BNAs, PAHs, Explosives, Pentacholorophenol	Glass, teflon-lined cap	Cool, 4C	14 days to extraction; 40 days for analysis
Volatile organics	EnCore sampler	Cool, 4C	48 hours to methanol preservation; 14 days for analysis
Total Organic Carbon	Glass, teflon-lined cap	Cool, 4 C	28 days
Chemical Agent Degradation			
Phosphonic acids Phosphonate esters Thiodiglycol Organosulfur compounds	Glass, teflon-lined cap	Cool, 4 C	6 months
Physical Parameters			
Grain Size [d]	Glass	Cool, 4 C	6 months

(a) From date of sample collection (40 CFR Part 261).

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3.2.2 Soil Sampling From Excavations

Several soil samples were collected during test trenching activities. During sampling of the trenches, soil from a selected location (based on staining or PID readings) was retrieved using the bucket of the excavator. Soil which had not touched the excavator, and which appeared to be in clods that had been minimally disturbed, were chosen for the sample aliquot. For samples submitted for laboratory analyses of VOCs, an EnCore™ sampler was used to retrieve the VOC aliquot. The soil for the remaining analytical parameters was homogenized in a stainless steel bowl and placed in appropriate sample containers.

3.3 GROUND-WATER SAMPLING

After reviewing field-screening results from soil, the sample location exhibiting the highest levels of constituents of potential concern (COPC), or exhibiting the potential to produce ground water, was selected for installation of a 2-in. temporary well point. In situations where no samples exhibited COPC, the sample location with the highest potential for presence of COPC was selected. In some areas, however, a water-bearing zone was not encountered, or was encountered in a location that did not contain COPC. If at all possible, a ground-water sample was retrieved from each area, even if the temporary sampling point had to be installed in a location that did not contain COPC.

Initially, 1-in. diameter polyvinyl chloride (PVC) pipes were installed as temporary sampling points using direct push. However, the recharge rate in this size point proved to be insufficient. The diameter of the PVC screen and riser were increased to 2-in. inner diameter. A 4.25 outer-diameter hollow stem auger rig was used to install this larger size sampling point. Clean sand was used to fill the annular space between the screen and the wall of the borehole. Bentonite was used to seal the annular space at the top of the borehole.

In accordance with the SOPs included in the Work Plan, ground-water samples were collected using variable-speed peristaltic pumps equipped with dedicated ½-in. inner diameter high-density polyethylene (HDPE) tubing. Peristaltic pumps were selected to collect ground-water samples due to their ability to minimize physical disturbance (turbulence) at the sampling point and to minimize chemical changes (aeration) in the medium.

Because the ground-water sampling points were not meant to be monitoring wells and were designed to be temporary sampling points, a minimal amount of clean sand and completion materials were used in the construction of the points. Also, ground-water samples were collected from the well points immediately following installation and upon availability of sufficient ground water. Therefore, it was not necessary to purge water from the well point to ensure that a representative sample of formation water could be obtained.

Tubing was inserted into the well point at approximately the depth of the mid-point of the screened interval. Care was taken to minimize subsurface disturbances during ground-water sample collection, thereby minimizing sample alteration due to sampling actions.

The ground-water was collected directly into pre-preserved bottles. Table 3.3-1 outlines the preservation used for each aliquot. These same preservation procedures were used for all aqueous samples, i.e., surface water and wastewater samples. For the collection of the dissolved metals aliquot, a dedicated 0.45 μm in-line filter was used to filter the ground water. The filtered sample was collected directly into a pre-preserved Nalgene bottle, as outlined on Table 3.3-1.

Generally, one ground-water sample per area was submitted for laboratory analysis of full-suite or DOD-marker compound analysis. Full-suite parameters included the following laboratory analyses:

- Target Compound List (TCL) analytes – VOCs, SVOCs, pesticides, and PCB. To achieve lower detection levels, a separate method was used to analyze for PCP and PAHs.

- Target Analyte List (TAL) analytes – metals and cyanide

- DOD marker analytes – explosives, boron, and lithium.

DOD-marker compounds included laboratory analysis of boron, lithium, and explosives (see Section 3.6 and Table 3.6-1).

In some areas, it was necessary to submit the ground-water samples for analysis of an abbreviated suite of parameters due to the insufficient amount of ground water available during sampling. For these locations, the sample was collected over a series of up to 5 days in an

Table 3.3-1 Containers, Preservation Technique, and Holding Times for Aqueous Samples Collected at the Former LOOW, Niagara County, NY Phase I RI

Parameter	Container(b)	Preservative	Holding Time(a)c)
Metals, total and dissolved			
Mercury	Plastic	HNO_3 to pH <2	28 days
Metals, other	Plastic	HNO_3 to pH <2	6 months
General Chemistry			
Ammonia-nitrogen	Plastic	Cool, 4 C, H_2SO_4 to pH <2	28 days
Cyanide	Plastic	Cool, 4C, NaOH to pH>10	14 days
Anions by IC: Chloride, Fluoride, Nitrate-nitrogen, Nitrite-nitrogen, Sulfate	Plastic	Cool, 4C	28 days for all anion except Nitrite which is 48 hours
Sulfide	Plastic	Cool, 4C, Zinc Acetate/NaOH pH >12	7 days
Total phosphorous	Plastic	Cool, 4 C, H_2SO_4 to pH <2	28 days
Orthophosphate phosphorous	Plastic	Cool, 4 C	48 hours
Organics			
Biochemical Oxygen Demand	Plastic	Cool, 4C	48 hours
Chemical Oxygen Demand	Plastic	H_2SO_4 to pH <2	28 days
Pesticides/PCBs	Glass, amber, teflon-lined cap	Cool, 4C	7 days to extraction; 40 days for analysis
Explosives	Glass, amber, teflon-lined cap	Cool, 4C	7 days to extraction; 40 days for analysis
Semivolatile organics (SVOA, PAHs, and Pentachlorophenol)	Glass, amber, teflon-lined cap	Cool, 4C	7 days to extraction 40 days for analysis
Volatile organics	Glass, teflon-lined septum	Cool, 4C, HCl to pH <2	14 days
Chemical Agent Degradation Products			
Phosphonic acids Phosphonate esters Thiodiglycol Organosulfur compounds	Glass, amber, teflon-lined cap	Cool, 4 C	6 months

(a) From date or time of sample collection (40 CFR Part 136.3).

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attempt to retrieve enough water for a full suite of analyses. For these samples, the aliquot with the shortest holding time was collected last, while all aliquots from the sample location shared the same sampling date and time. The sampling date and time for all aliquots were assigned during the initial sampling attempt.

3.4 SURFACE WATER AND SEDIMENT SAMPLING

Surface water samples were collected from predetermined sampling locations, generally at a confluence with a second drainage, and at property boundaries. To minimize possible impact from sediment in the surface water samples, surface water was collected first, followed by sediment in the same location. The surface water sample was collected by submersing a dedicated glass sampling bottle just below the surface of the water, then transferring the water to the appropriate sampling containers. Care was taken to avoid aeration of the sample during filling of the bottles. Surface water samples were submitted for laboratory analysis of DOD-marker compounds and water quality parameters including total dissolved solids, chloride, fluoride, nitrate, nitrite, O-phosphate, sulfate, ammonia, total Kjeldahl nitrogen, total phosphorus, total sulfide, biological oxygen demand, and chemical oxygen demand.

Sediment samples were collected from each sampling location, generally at the head of a drainage, confluence of the drainage with another drainage, or at property lines. Stainless steel scoops were used to collect sediment from the side of the drainage. The sediment was placed into a stainless steel bowl and homogenized before being placed into appropriate sample containers. Sediment samples were analyzed for DOD marker compounds. Sediment samples were field screened, as well as submitted for laboratory analysis (see Section 3.6 and Table 3.6-2 for the complete list of laboratory analyses). In addition, a subset of sediment samples from each drainage was analyzed for grain size.

3.5 WASTEWATER AND SLUDGE SAMPLING

Wastewater and sludge samples were collected from underground lines, manholes, and sumps associated with former LOOW waste systems as described in the Work Plan. Wastewater samples were collected using variable-speed peristaltic pumps equipped with dedicated ½-in. inner diameter HDPE tubing. When the depth to sludge was deeper than 2.5 ft bgs, sludge samples were collected using either a stainless steel petite ponar (when depth of sludge was adequate) or a dedicated HDPE scoop attached to a retractable aluminum rod. When the depth to sludge was less than 2.5 ft bgs, the sludge was retrieved with a stainless steel scoop.

After retrieval, the wastewater and sludge samples were placed into appropriate sample containers, bagged, and iced. Samples were submitted for either DOD marker compounds or full suite parameters, depending on the sampling location. Sludge samples were field screened, as well as submitted for laboratory analysis.

3.6 LABORATORY ANALYTICAL METHODS

Laboratory analyses were conducted in accordance with the Final Quality Assurance Project Plan (QAPP), which was included in the Work Plan. Samples chosen for laboratory analysis were submitted for either full suite parameters or DOD marker compounds depending on the area of investigation (Table 3.6-1). The analytical methods as well as the analytes reported for each method are listed in Table 3.6-2. Some deviations from this sampling scheme occurred during the Phase I RI, due to insufficient ground-water recovery. In addition, some samples were submitted for laboratory analysis of additional parameters, based on the need to obtain confirmatory results for the field screening analyses. Specific deviations from the analytical program are discussed with respect to the specific samples collected from each area of investigation (Chapters 5 through 13).

EA Laboratories, located in Sparks, Maryland, was used for analysis of full suite parameters with the exception of volatile organic analyses in soil, which was performed by Quanterra Inc, located in Pittsburgh, Pennsylvania. DataChem Laboratories, Inc., located in Salt Lake City, Utah performed analyses of chemical warfare degradation products.

TABLE 3.6-1 SUMMARY OF SAMPLING ANALYSIS BY COMPONENT
FOR THE FORMER LOOW, NIGARA COUNTY, NY, PHASE I RI

Component/Site	Area	Site Code	Laboratory Analyses	
Component 1 (CWM)/Former LOOW	Nitration Houses	NH	Full Suite[1]	
Component 1 (CWM)/Other Possible Areas of DOD Activity	Areas C & North of C	CD	DOD[2,3]	
	Waterline Construction Areas	WC	DOD	
	Trash Pit	TP	Full Suite	
	Property G Drum Area	PG	Full Suite	
Component 1 (CWM)/Former AFP-68	Process Area 2	2	Full Suite	
	Process Area 4	4	Full Suite	
	Process Area 7	7	Full Suite	
	Process Area 8	8	Full Suite	
	Process Area 10	10	Full Suite	TOC[6]
	Process Area 11	11	Full Suite	
	Process Area 14	14	DOD	
	Process Area 16	16	DOD	
	Process Area 18S	18S	Full Suite	
	Process Area 20	20	DOD	
	Process Area 22	22	DOD	
	Process Area 24	24	DOD	
Component 1 (CWM) Former Navy IPPP	Navy IPPP	IP	DOD	
Component 2 (Somerset Group) Former AFP-68	Ground Scar	GS	Full Suite	
	T-1 & T-2	T1T2	Full Suite	
	T-3	T3	DOD	
	Process Area 3	03	DOD	TOC[6]
	Process Area 5	05	Full Suite	
	Process Area 18N	18N	Full Suite	
	Process Area 30A	30A	Full Suite	
Component 3 (Town of Lewiston) Former LOOW	WWTP	WWTP	DOD/Cyanide	TOC[6]
	WWTP Shops – North	VS	Full Suite	
Component 5 (NFSS) Former LOOW	WWTP Shops – South	VS	Full Suite	
	Acid Concentration Area	AC	Full Suite	TOC[6]
	Shop Area South of O Street	SO	Full Suite	
Component 6 (Modern Disposal) Former LOOW Utilities	Former LOOW Incinerator	IN	Full Suite	
Component 7 Former LOOW Utilities	Sanitary Sewer	SS	Full Suite/DOD	
	Acid Waste Sewer	AW	Full Suite/DOD	
	Storm Sewers	ST	Full Suite/DOD	
	30-in. WWTP Discharge	30	DOD	
Component 8 Former AFP-68 Utilities	Sanitary Sewer	SS	DOD	
Component 9 Surface Drainage[4]	Four Mile Creek & Drainage	4	DOD DOD/CWD[7]	Grain Size[5]
	Six Mile Creek	6	DOD/hydrazine	
	Twelve Mile Creek	12		
LOOW Background	—	BKGD	Full Suite	

[1] "Full Suite" includes SW-846 TCL/TAL analytes, explosives, boron, and lithium.
[2] "DOD" includes explosives, boron, and lithium.
[3] Samples collected from the drum trench excavated in Area C were submitted for full suite.
[4] Surface-water samples were analyzed for standard water quality parameters including: ammonia-nitrogen, anions (chloride, fluoride, nitrate-nitrogen, nitrite-nitrogen, sulfate, sulfide), biochemical oxygen demand (BOD), chemical oxygen demand (COD), total Kjeldahl nitrogen (TKN), total suspended solids (TSS), total phosphorous, and orthophosphate phosphorous.
[5] A subset of sediment samples from each drainage were analyzed for grain size.
[6] Representative soil samples were analyzed for TOC.
[7] CWD = Chemical Warfare Degradation Products {1,4-dithiane, p-chlorophenylmethylsulfide (CPMS), p-chlorophenylmethylsulfoxide (CPMSO), p-chlorophenylmethylsulfone (CPMSO2), diisopropylmethylphosphonate, dimethylmethylphosphonate, isopropylmethylphosphonic acid (IMPA), methylphosphonic acid (MPA), thiodiglycol, fluoroacetic acid, 1,4-oxathiane, dimethyldisulfide, choloroacetic acid, benzothiazole}.

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TABLE 3.6-2 LABORATORY METHODS FOR SAMPLES COLLE… …ED AT THE FORMER LOOW, NIAGARA COUNTY, NY, PHASE I R…

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
VOLATILES				
Chloromethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Bromomethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Vinyl Chloride	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Chloroethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Methylene Chloride	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Acetone	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Carbon Disulfide	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
1,1-Dichloroethene	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
1,1-Dichloroethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
1,2-Dichloroethene (total)	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Chloroform	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
1,2-Dichloroethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
2-Butanone	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
1,1,1-Trichloroethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Carbon Tetrachloride	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Bromodichloromethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Dibromochloromethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
1,1,2-Trichloroethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Benzene	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
trans-1,3-Dichloropropene	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Bromoform	GC/MS	SW846 5030B	SW846 5035	SW846 8260B

TABLE 3.6-2 LABORATORY METHODS FOR SAMPLES COLLECTED AT THE FORMER LOOW, NIAGARA COUNTY, NY, PHASE I RI

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
4-Methyl-2-pentanone	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
2-Hexanone	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Tetrachloroethene	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
1,1,2,2-Tetrachloroethane	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Toluene	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Chlorobenzene	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Ethylbenzene	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Styrene	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
Xylenes (total)	GC/MS	SW846 5030B	SW846 5035	SW846 8260B
SEMIVOLATILES				
Phenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
bis-(2-Chloroethyl)ether	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2-Chlorophenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
1,4-Dichlorobenzene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
1,3-Dichlorobenzene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
1,2-Dichlorobenzene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2-Methylphenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2,2'-oxybis (1-Chloropropane)	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
4-Methylphenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
N-Nitroso-di-n-propylamine	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Hexachloroethane	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
Nitrobenzene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Isophorone	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2-Nitrophenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2,4-Dimethylphenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
bis(2-Chloroethoxy)methane	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2,4-Dichlorophenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
1,2,4-Trichlorobenzene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Naphthalene	GC/MS	SW846 3520C	SW846 3540A	SW846 8310
4-Chloroaniline	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Hexachlorobutadiene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
4-Chloro-3-methylphenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2-Methylnaphthalene	GC/MS	SW846 3520C	SW846 3540A	SW846 8310
Hexachlorocyclopentadiene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2,4,6-Trichlorophenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2,4,5-Trichlorophenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2-Chloronaphthalene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2-Nitroaniline	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Dimethylphthalate	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Acenaphthylene	GC/MS	SW846 3520C	SW846 3540A	SW846 8310
2,6-Dinitrotoluene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
3-Nitroaniline	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Acenaphthene	GC/MS	SW846 3520C	SW846 3540A	SW846 8310

TABLE 3.6-2 LABORATORY METHODS FOR SAMPLES COLLECTED AT THE FORMER LOOW, NIAGARA COUNTY, NY, PHASE I RI

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
2,4-Dinitrophenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
4-Nitrophenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Dibenzofuran	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
2,4-Dinitrotoluene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Diethylphthalate	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
4-Chlorophenyl-phenyl ether	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Fluorene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
4-Nitroaniline	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
4,6-Dinitro-2-methylphenol	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
N-Nitrosodiphenylamine	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
4-Bromophenyl-phenylether	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Hexachlorobenzene	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Pentachlorophenol	GC/ECD	NA	NA	SW846 8151A
Phenanthrene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
Anthracene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
Carbazole	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Di-n-butylphthalate	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Fluoranthene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
Pyrene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
Butylbenzylphthalate	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
3,3'-Dichlorobenzidine	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Benzo(a)anthracene	HPLC	SW846 3520C	SW846 3540A	SW846 8310

TABLE 3.6-2 LABORATORY METHODS FOR SAMPLES COLLE[illegible]ED AT THE FORMER LOOW, NIAGARA COUNTY, NY, PHASE I[illegible]

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
Chrysene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
bis(2-Ethylhexyl)phthalate	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Di-n-octylphthalate	GC/MS	SW846 3520C	SW846 3540A	SW846 8270C
Benzo(b)fluoranthene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
Benzo(k)fluoranthene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
Benzo(a)pyrene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
Indeno(1,2,3-cd)-pyrene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
Dibenzo(a,h)-anthracene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
Benzo(g,h,i)perylene	HPLC	SW846 3520C	SW846 3540A	SW846 8310
PESTICIDES/AROCLORS				
alpha-BHC	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
beta-BHC	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
delta-BHC	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
gamma-BHC (Lindane)	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Heptachlor	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Aldrin	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Heptachlor expoxide	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Endosulfan I	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Dieldrin	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
4,4'-DDE	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Endrin	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Endosulfan II	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A

TABLE 3.6-2 LABORATORY METHODS FOR SAMPLES COLLECTED AT THE FORMER LOOW, NIAGARA COUNTY, NY, PHASE I RI

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
Endosulfan sulfate	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
4,4-DDT	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Methoxychlor	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Endrin ketone	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Endrin aldehyde	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
alpha-Chlordane	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
gamma-Chlordane	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Toxaphene	GC/ECD	SW846 3520C	SW846 3540A	SW846 8081A
Aroclor-1016	GC/ECD	SW846 3520C	SW846 3540A	SW846 8082
Aroclor-1221	GC/ECD	SW846 3520C	SW846 3540A	SW846 8082
Aroclor-1232	GC/ECD	SW846 3520C	SW846 3540A	SW846 8082
Aroclor-1242	GC/ECD	SW846 3520C	SW846 3540A	SW846 8082
Aroclor-1248	GC/ECD	SW846 3520C	SW846 3540A	SW846 8082
Aroclor-1254	GC/ECD	SW846 3520C	SW846 3540A	SW846 8082
Aroclor-1260	GC/ECD	SW846 3520C	SW846 3540A	SW846 8082
METALS/CYANIDE				
Aluminum	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Antimony	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Arsenic	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Barium	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Beryllium	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B

TABLE 3.6-2 LABORATORY METHODS FOR SAMPLES COLL[illegible]D AT THE FORMER LOOW, NIAGARA COUNTY, NY, PHASE I[illegible]

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
Boron	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Cadmium	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Calcium	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Chromium, Hexavalent	Colorimetry	NA	NA	SW846 7196
Chromium	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Cobalt	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Copper	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Iron	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Lead	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Lithium	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Magnesium	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Manganese	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Mercury	CVAA	NA	NA	SW846 7470
Nickel	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Potassium	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Selenium	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Silver	ICP - TRACE	SW846 3010A	SW846 3050A	SW846 6010B
Sodium	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Thallium	GFAA	SW846 3020A	SW846 3050A	SW846 7841
Vanadium	ICP	SW846 3010A	SW846 3050A	SW846 6010B
Zinc	ICP	SW846 3010A	SW846 3050A	SW846 6010B

TABLE 3.6-2 LABORATORY METHODS FOR SAMPLES COLLECTED AT THE FORMER LOOW, NIAGARA COUNTY, NY, PHASE I RI

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
Cyanide	Colorimetry	NA	ASA 10-2	SW846 9012
EXPLOSIVES [4]				
HMX	HPLC	NA	NA	SW846 8330
RDX	HPLC	NA	NA	SW846 8330
135TNB	HPLC	NA	NA	SW846 8330
13DNB	HPLC	NA	NA	SW846 8330
NB	HPLC	NA	NA	SW846 8330
TETRYL	HPLC	NA	NA	SW846 8330
246TNT	HPLC	NA	NA	SW846 8330
4amDNT	HPLC	NA	NA	SW846 8330
2amDNT	HPLC	NA	NA	SW846 8330
26DNT	HPLC	NA	NA	SW846 8330
24DNT	HPLC	NA	NA	SW846 8330
2NT	HPLC	NA	NA	SW846 8330
4NT	HPLC	NA	NA	SW846 8330
3NT	HPLC	NA	NA	SW846 8330
CHEMICAL WARFARE DEGRADATION PRODUCTS				
Benzothiazole	GC/FPD	AAA8	LL05	AAA8/LL05
Chlororoacetic acid	IC	UT04	LT04	UT04/LT04
p-Chlorophenylmethylsulfide	GC/FPD	AAA8	LL05	AAA8/LL05

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
p-Chlorophenylmethylsulfone	GC/FPD	AAA8	LL05	AAA8/LL05
p-Chlorophenylmethylsulfoxide	GC/FPD	AAA8	LL05	AAA8/LL05
Dimethyldisulfide	GC/FPD	AAA8	LL05	AAA8/LL05
Dimethylmethylphosphonate	GC/FPD	UK11	LK09	UK11/LK09
1,4-Dithiane	GC/FPD	AAA8	LL05	AAA8/LL05
Diisopropylmethylphosphonate	GC/FPD	UK11	LK09	UK11/LK09
Fluoroacetic acid	IC	UT04	LT04	UT04/LT04
Methylphosphonic acid	IC	UT04	NA*	UT04
Isopropylmethylphosphonic acid	IC	UT04	LT04	UT04/LT04
1,4-Oxathiane	GC/FPD	AAA8	LL05	AAA8/LL05
Thiodiglycol	GC/SCD/ HPLC	UL09	LL9	UL09/LL09
HYDRAZINE				
Hydrazine				ASTM1385
GENERAL CHEMISTRY				
Ammonia Nitrogen	Colorimetry	NA	NA	EPA 350.1
BOD	Electrode	NA	NA	EPA 405.1
Chloride	IC	NA	NA	EPA 300.0
COD	Colorimetry	NA	NA	EPA 410.4
Fluoride	IC	NA	NA	EPA 300.0
Nitrite Nitrogen	IC	NA	NA	EPA 300.0

TABLE 3.6-2 LABORATORY METHODS FOR SAMPLES COLLECTED AT THE FORMER LOOW, NIAGARA COUNTY, NY, PHASE I RI

Target Compounds	Analytical Technique	Water Preparation Method	Sediment/Soil Preparation Method	Determinative Method
Orthophosphate Phosphorus	IC	NA	NA	EPA 300.0
Sulfate	IC	NA	NA	EPA 300.0
Total Phosphorus	Colorimetry	NA	NA	EPA 365.4
Total Suspended Solids	Gravimetry	NA	NA	EPA 160.1
Total Kjeldahl Nitrogen	Colorimetry	NA	NA	EPA 351.2
Total Organic Carbon	IR Spectrometry	NA	NA	NA

Method References:

ASA, 1982. Page, A.L., R.H. Miller, and D.R. Keeney, eds. 1982. Methods of Soil Analysis, Part 2: Chemical and Microbiological Properties, 2nd edition. American Society of Agronomy, Madison, Wis.

EPA, 1983. United States Environmental Protection Agency. 1979. Revised March 1983. Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020. U.S. EPA, Cincinnati, Ohio.

EPA, 1997 United States Environmental Protection Agency. June 1997. Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846, 3rd edition. including UPDATE III. U.S. EPA, Washington, D.C.

3.7 GEOPHYSICAL SURVEYING

A geophysical survey using a Geonics EM-34 was performed in the area North of C to explore an area that was inaccessible during the 1988 RI, due to the presence of a large soil pile. This survey area was also extended west to include Second Avenue, an area of ground scarring in the 1960 aerial photographs (EA 1998a). Geophysical data was collected every 25 ft along established east-west trending traverse lines. North-south traverse lines were established only if anomalies were encountered in the east-west traverse. To better delineate the anomalies that were found, a magnetometer was used to outline the anomaly for exploratory excavation.

A magnetometer survey was performed in Area C to relocate the anomaly first discovered by Ecology and Environment in 1985. Another survey was conducted at the former LOOW nitration houses to evaluate the suspected presence of buried metal (possible underground storage tank).

3.8 TRENCHING AND EXCAVATION

A John Deere 190E and a Kobelco SK130LC excavator were used to perform exploratory trenching and excavation to evaluate geophysical anomalies in Areas C and North of C, to investigate suspected buried metal (potential underground storage tank at the nitration houses), and to delineate the extent of the Trash Pit. To evaluate the geophysical anomalies and to delineate the extent of the known trash pit, a series of trenches were excavated perpendicular to the anomaly or expected edge of the trash pit. The trenches were excavated to a depth of refusal (due to building foundation, etc.) or to a depth where there was no longer evidence of impact (based on visual observation). The typical width of the trench was 2.5 ft.

At the nitration houses, a pit was excavated to expose the underground lines associated with the observed vent pipe stick-up and to expose the buried metal identified during the magnetometer survey.

The excavations were performed in accordance with the Occupational Safety and Health Administration (OSHA) Standard for Excavations (29 Code of Federal Regulations [CFR] 1926.650-1926.652), as outlined in the Final Health and Safety Plan that was included in the Work Plan.

3.9 GLOBAL POSITIONING SYSTEM (GPS) SURVEYING

Sample location positions were calculated using the Trimble ProXRS Differential Global Positioning System (DGPS). The Trimble unit tracks up to 12 satellites to determine initial position. Using the United States Coast Guard (USCG) Differential Beacon System, the ProXRS applies the beacon radio signal to the satellite data to obtain sampling coordinate accuracies of +/- 1 to 3 meters. The USCG beacons transmit correction data from known points along the East Coast, West Coast, and Great Lakes areas of the United States. The beacons receive GPS position data themselves, correct the data based on the differences between the actual and observed ranges of tracked satellites, and transmit the data as Pseudorange Corrections (PRC). The PRC are transmitted from the beacon locations in the Medium Frequency band from 283.5 kHz to 325 kHz. The ProXRS receives the PRC and applies it to the GPS data collected at the sampling point to obtain differential accuracy.

3.10 DECONTAMINATION AND WASTE HANDLING PROCEDURES

When possible, dedicated sampling equipment was used to minimize decontamination activities. The small volume of fluid from decontamination of stainless steel bowls, trowels, and ponars was placed in 5-gal buckets and allowed to evaporate.

Waste generated by investigative activities was placed in plastic garbage bags and disposed as non-hazardous waste. Soil samples were archived until results of field screening were available. Once appropriate field screening results were obtained, soil cuttings were returned to the component from which they were originally collected and were scattered on the ground surface.

4. DATA COMPARISON CRITERIA

4.1 REGULATORY CRITERIA

Project activities at the former LOOW are performed under the Department of the Army DERP/FUDS program and are intended to investigate potential environmental impacts associated with former DOD practices/operations. The former LOOW is not listed on the U.S. Environmental Protection Agency (EPA) National Priorities List (NPL). However, because the DERP/FUDS program was established under the Superfund Amendment and Reauthorization Act (SARA), which was an amendment to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the requirements and guidance listed under CERCLA were followed at this site. New York State Department of Environmental Conservation (NYSDEC) coordinates regulatory oversight of project activities. Project activities are not under the provisions of the Resource Conservation and Recovery Act (RCRA) corrective action program, as this investigation is not being performed in conjunction with a RCRA permit.

The regulatory/guidance criteria (RGC) that were used in screening data from this Phase I RI are based upon NYSDEC guidance. The State's applicable standard or guidance value was selected as a screening criterion. To assist in identifying areas with elevated potential constituents of potential concern (COPC), the Phase I RI data were compared to $1/10^{th}$ of applicable State standard or guidance value in developing recommendations for each area of investigation. This conservative approach accounts for the possibility of multiple potential COPC and reduces the likelihood that a potential COPC will be eliminated when it should have been retained for further consideration.

For analytes with no value listed in the State's guidance documents, no screening criteria were selected. The selection of no criteria for these analytes was made in lieu of the New York State Spill Technology and Remediation Series (STARS) Memo criteria and the RCRA action levels presented in the Work Plan. This was changed primarily because these criteria pertain to cleanup actions under specific regulatory programs, and this site is not a petroleum spill site and is not subject to RCRA corrective action.

The following sections describe the selection of comparison criteria for the environmental media sampled during the Phase I RI. The selection of background concentrations as regulatory guidance values is discussed in Section 4.2. The RGC used for screening of Phase I

RI data are included in the data tables in Chapters 5 through 13. The data tables presented in Chapters 5 through 13 are "hits only" tables. Complete analytical summary tables are included in Appendix C. A key to the "hits only" data tables is provided in Table 4.1-1.

4.1.1 Soil

The TAGM No. 4046, *Determination of Soil Cleanup Objectives and Cleanup Levels* (NYSDEC 1994a, 1995) was used to develop RGC for soil. For several metals in soil, TAGM 4046 lists a recommended soil cleanup objective of "background" with no alternative guidance value. In these cases, background concentrations were selected (see Section 4.2). It should be noted that TAGM 4046 values were developed for future reuse scenarios that include permanent residential use, which is inconsistent with the current and planned future use of most of the areas investigated during this Phase I RI. Therefore, the TAGM 4046 cleanup objectives represent conservative comparison criterion.

Explosives are a potential COPC within the former LOOW facility and many of the explosive analytes do not have an associated clean-up objective listed in TAGM 4046. Therefore, values listed in TAGM No. 3028, *"Contained-In" Criteria for Environmental Media* (NYSDEC 1992) are used as guidance criteria for those explosives analytes that do not have a TAGM 4046 criteria. Table 4.1-1 lists the guidance values used for evaluation of soil results for the Phase I RI.

4.1.2 Ground Water

The ground water in the vicinity of the former LOOW is categorized as "Class GA, fresh ground water," according to the New York State Water Quality Regulations (Title 6, Ch. X, Part 701). The best usage of these waters is as a potable water supply. The regulations (Part 703.5) list ground-water quality standards for specific substances. The standards, and guidance values where no standards exist, are selected to be the most stringent levels based upon MCLs, or other procedures involving oncogenic and nononcogenic effects, aesthetic considerations, and chemical correlations. The ground water at the areas investigated during this Phase I RI is generally not used as a source of drinking water; however, the available RGC apply to water that will be used as a drinking water source. Therefore, the criteria used to evaluate the Phase I RI data will represent a conservative screening approach. Guidance values were taken from the NYSDEC Technical and Operational Guidance Series (TOGS)

TABLE 4.1-1 COMPREHENSIVE KEY TO "HITS ONLY" TABLES

Note that the data tables within Chapters 4-13 of this report are "hits only" tables. Comprehensive data summary tables are located in Appendix C. This key applies to the "hits only" tables and not to the summary tables. A similar table, specific to the comprehensive summary data tables, is included as the first page of Appendix C

Explanation of Cell Contents

(blank)	=	(blank cell) value was below the instrument detection limit.
4.5	=	(data with no shading) reported value does not exceed comparison criteria.
4.5	=	(data with light shading) reported value exceeds 1/10th of the comparison criteria (action level)
4.5	=	(data with darker shading) reported values exceeds the full value of the comparison criteria.
NA	=	sample was not analyzed for this parameter.

Explanation of Sample Designation

Generally the sample designations consist of the component number (i.e., "C1" for component 1), the area of investigation (i.e., "NH" for nitration houses), the matrix (i.e., "SO" for soil), the location (i.e., "G100" grid location or "BP1" for biased point location), and the sample depth. For the background locations, the designation consists of a prefix of "BKGD" followed by the matrix, sequential sample number, and the depth.

A suffix of "REF" at the end of the sample designation indicates that the sample was both field screened and submitted for laboratory analyses.

A suffix of "DUP" indicates that the sample is a duplicate of an original sample.

Explanation of Action Level

Chapter 4 Tables 4.1-2 through 4.1-5 list the action levels for each matrix and the source of the action level.

Inorganic Analysis Data Qualifiers

Concentration (C) qualifiers:

B — Reported value is less than the Contract Required Detection Limit (CRDL), but greater than the Instrument Detection Limit (IDL).

U — Analyte analyzed for but not detected (concentration is less than the IDL).

Quality control (Q) qualifiers:

E — Reported value is estimated because of presence of interference.
M — Duplicate injection precision not met.
N — Spiked sample recovery is not within control limits.
S — Reported value is determined by the method of standard additions (MSA).
W — Post-digestion spike for furnace AAS analysis is out of control limits (85–115%) and sample absorbance is less than 50% of the spike absorbance.
* — Duplicate analyses are not within control limits.
+ — Correlation coefficient for MSA is less than 0.995.

TABLE 4.1-1 COMPREHENSIVE KEY TO "HITS ONLY" TABLES (Continued)

Method (M) qualifiers:

P	Inductively-Coupled Plasma (ICP)
A	Flame Atomic Absorption Spectrophotometric (AAS)
F	Furnace AAS
CV	Cold Vapor AAS
AV	Automated Cold Vapor AAS
AS	Semi-automated Spectrophotometric
T	Titrimetric
NR	Analyte is not required to be determined

Organic Analysis Data Qualifiers

ND or U — Indicates a compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution, and if a soil sample, for percent moisture. For example, 10 U is used for phenol in water if the sample final volume is the protocol-specified final volume. If a 1:10 dilution of the extract was necessary, the reported limit is (10 x 10 U) or 100 U. For a soil sample, the value is also adjusted for percent moisture. For example, if the sample had 24% moisture and a 1:10 dilution factor (df), the soil sample quantitation limit for phenol (330 U) would be corrected as follows:

Reported limit = (330 U) x df / D

where:

D = (100 – %moisture) / 100

Example: At 24% moisture, D = (100 – 24) / 100 = 0.76

Reported limit = (330 U) x 10 / 0.76 = 4300 U (rounded to 2 significant figures)

For soil samples subjected to gel permeation chromatography (GPC) cleanup procedures, the contract required quantitation limit (CRQL) is also multiplied by 2 to account for the fact that only half of the extract is recovered. *Note*: If GPC procedures are employed, the factor of 2 is not included in the dilution factor reported; a "Y" is entered for GPC (Y/N).

TR or J — Indicates an estimated value. This qualifier is used under the following circumstances:

1. When estimating a concentration for tentatively identified compounds where a 1:1 response is assumed.
2. When the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL but greater than zero.
3. When the retention time data indicate the presence of a compound that meets the pesticide/Aroclor identification criteria and the result is less than the CRQL but greater than zero.

Note: The "J" qualifier is not used and the compound is not reported as being identified for pesticide/Aroclor results less than the CRQL, if the technical judgement of the pesticide residue analysis expert determines that the peaks used for compound identification resulted from instrument noise or other interferences (column bleed, solvent contamination, etc.). For example if the sample quantitation limit is 10 μg/L but a concentration of 3 μg/L is calculated, reported as 3 J. The sample quantitation limit must be adjusted for dilution as discussed for the "U" qualifier.

C	This qualifier applies to pesticide results where the identification has been confirmed by GC/MS. Single component pesticides with concentration equal to or greater than 10 ng/µL in the final extract must be confirmed by GC/MS.
B	This qualifier is used when the analyte is found in the associated blank, as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This qualifier is used for TIC as well as for positively identified compounds.
D	This qualifier identifies compounds identified in the analysis at a secondary dilution factor. If a sample or extract is reanalyzed at a higher dilution factor, as in the "E" qualifier above, the "DL" suffix is appended to the sample number on the report for the diluted sample, and concentration values reported are qualified with a "D."
A	This qualifier indicates that a TIC is a suspected aldol-condensation product.
E	This qualifier identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis. If one or more compounds has a response greater than full scale, the sample or extract must be diluted and reanalyzed according to the specifications listed in the SOW. All compounds with a concentration greater than full scale should have a concentration qualified with an "E" for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses are reported separately. The report for the diluted sample will have the "DL" suffix appended to the sample number. *Note:* For total xylenes, where 3 isomers are quantified as 2 peaks, the calibration range of each peak is considered separately. For example, a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 µg/L.
X	Other specific qualifiers may be required to properly define the results. If used, they are fully described and such description attached to the Sample Data Summary Package and the Case Narrative. The qualifiers begin by using "X." If more than one qualifier is required, "Y" and "Z" are used as needed. For instance, the "X" qualifier might combine the qualifiers for a sample.
N	Indicates presumptive evidence of a compound. This qualifier is only used for tentatively identified compounds, where the identification is based on a mass spectral library search.
P	This qualifier is used when there is greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported and qualified with a "P".
~	Duplicate analysis not within control limits.

<u>Common Acronyms Found on the Data Tables</u>

CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantitation Limit
DIL/DL	Dilution (see above explanation)
MCL	Maximum Contaminant Level
Qual	Qualifier
RBC	EPA Risk Based Concentration
RE	Re-extraction of sample (see explanation of lab QA/QC procedures)

TABLE 4.1-1 COMPREHENSIVE KEY TO "HITS ONLY" TABLES (Continued)

Common Acronyms Found on the Data Tables, con't

SQL	Sample Quantitation Limit
ER-M	Effects Range-Median concentrations, (refer to Long and Morgan 1990)

TABLE 4.1-2 SOIL GUIDANCE USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Criteria Type	Constituent	Comparison Criteria	Unit
NYTAGM	1,1,1-Trichloroethane	0.8	mg/kg
NYTAGM	1,1,2,2-Tetrachloroethane	0.6	mg/kg
NYTAGM	1,1-Dichloroethane	0.2	mg/kg
NYTAGM	1,1-Dichloroethylene	0.4	mg/kg
NYTAGM	1,2,4-Trichlorobenzene	3.4	mg/kg
NYTAGM	1,2-Dichlorobenzene	7.97	mg/kg
NYTAGM	1,2-Dichloroethane	0.1	mg/kg
NY Guidance	1,3,5-Trinitrobenzene	4	mg/kg
NYTAGM	1,4-Dichlorobenzene	8.5	mg/kg
NYTAGM	2,4,5-Trichlorophenol	0.1	mg/kg
NY Guidance	2,4,6-Trinitrotoluene	40	mg/kg
NYTAGM	2,4-Dichlorophenol	0.4	mg/kg
NYTAGM	2,4-Dinitrophenol	0.2	mg/kg
NY Guidance	2,4-Dinitrotoluene	1	mg/kg
NY Guidance	2,6-Dinitrotoluene	1	mg/kg
NYTAGM	2-Butanone	0.3	mg/kg
NYTAGM	2-Chlorophenol	0.8	mg/kg
NYTAGM	2-Methylphenol	0.1	mg/kg
NYTAGM	2-Nitroaniline	0.43	mg/kg
NYTAGM	2-Nitrophenol	0.33	mg/kg
NY Guidance	2-Nitrotoluene	800	mg/kg
NYTAGM	3-Nitroaniline	0.5	mg/kg
NY Guidance	3-Nitrotoluene	800	mg/kg
NYTAGM	4,4'-DDD	2.9	mg/kg
NYTAGM	4,4'-DDE	2.1	mg/kg
NYTAGM	4,4'-DDT	2.1	mg/kg
NYTAGM	4-Chloro-3-methylphenol	0.24	mg/kg
NYTAGM	4-Methyl-2-pentanone	1	mg/kg
NYTAGM	4-Methylphenol	0.9	mg/kg
NYTAGM	4-Nitrophenol	0.1	mg/kg
NY Guidance	4-Nitrotoluene	800	mg/kg
NYTAGM	Acenaphthene	50	mg/kg
NYTAGM	Acenaphthylene	41	mg/kg
NYTAGM	Acetone	0.2	mg/kg
NYTAGM	Aldrin	0.041	mg/kg
NYTAGM	Alpha-BHC	0.11	mg/kg
NYTAGM	Alpha-chlordane	0.54	mg/kg
NYTAGM-US	Aluminum	33000	mg/kg
NYTAGM	Anthracene	50	mg/kg
NYTAGM-B	Antimony	0.6	mg/kg
NYTAGM	Aroclor 1016	1000	ug/kg
NYTAGM	Aroclor 1221	1000	ug/kg
NYTAGM	Aroclor 1232	1000	ug/kg
NYTAGM	Aroclor 1242	1000	ug/kg
NYTAGM	Aroclor 1248	1000	ug/kg
NYTAGM	Aroclor 1254	1000	ug/kg
NYTAGM	Aroclor 1260	1000	ug/kg
NYTAGM-BG	Arsenic	34	mg/kg
NYTAGM	Barium	300	mg/kg
NYTAGM	Benz[a]anthracene	0.224	mg/kg
NYTAGM	Benzene	0.06	mg/kg
NYTAGM	Benzo[a]pyrene	0.061	mg/kg
NYTAGM	Benzo[b]fluoranthene	0.224	mg/kg

TABLE 4.1-2 SOIL GUIDANCE USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Criteria Type	Constituent	Comparison Criteria	Unit
NYTAGM	Benzo[ghi]perylene	50	mg/kg
NYTAGM	Benzo[k]fluoranthene	0.224	mg/kg
NYTAGM	Benzyl Butyl Phthalate	50	mg/kg
NYTAGM-BG	Beryllium	1.4	mg/kg
NYTAGM	Beta-BHC	0.2	mg/kg
NYTAGM	Bis(2-ethylhexyl) Phthalate	50	mg/kg
NYTAGM	Cadmium	10	mg/kg
NYTAGM	Carbon Disulfide	2.7	mg/kg
NYTAGM	Carbon Tetrachloride	0.6	mg/kg
NYTAGM	Chlorobenzene	1.7	mg/kg
NYTAGM	Chloroethane	1.9	mg/kg
NYTAGM	Chloroform	0.3	mg/kg
NYTAGM	Chromium	50	mg/kg
NYTAGM	Chrysene	0.4	mg/kg
NYTAGM	Cis-1,2-dichloroethene	0.25	mg/kg
NYTAGM	Cobalt	30	mg/kg
NYTAGM-BG	Copper	50	mg/kg
NYTAGM	Delta-BHC	0.3	mg/kg
NYTAGM	Dibenz[a,h]anthracene	0.014	mg/kg
NYTAGM	Dibenzofuran	6.2	mg/kg
NYTAGM	Dieldrin	0.044	mg/kg
NYTAGM	Diethyl Phthalate	7.1	mg/kg
NYTAGM	Dimethyl Phthalate	2	mg/kg
NYTAGM	Di-n-butyl Phthalate	8.1	mg/kg
NYTAGM	Di-n-octyl Phthalate	50	mg/kg
NYTAGM	Endosulfan I	0.9	mg/kg
NYTAGM	Endosulfan II	0.9	mg/kg
NYTAGM	Endosulfan Sulfate	1	mg/kg
NYTAGM	Endrin	0.1	mg/kg
NYTAGM	Ethylbenzene	5.5	mg/kg
NYTAGM	Fluoranthene	50	mg/kg
NYTAGM	Fluorene	50	mg/kg
NYTAGM	Gamma-BHC	0.06	mg/kg
NYTAGM	Gamma-chlordane	0.54	mg/kg
NYTAGM	Heptachlor	0.1	mg/kg
NYTAGM	Heptachlor Epoxide	0.02	mg/kg
NYTAGM	Hexachlorobenzene	0.41	mg/kg
NYTAGM	Indeno[1,2,3-cd]pyrene	3.2	mg/kg
NYTAGM	Iron	2000	mg/kg
NYTAGM	Isophorone	4.4	mg/kg
NYTAGM	Lead	400	mg/kg
NYTAGM	M & P-xylenes	1.2	mg/kg
NYTAGM-US	Manganese	5000	mg/kg
NYTAGM	M-dichlorobenzene	1.6	mg/kg
NY Guidance	M-Dinitrobenzene	8	mg/kg
NYTAGM	Mercury	0.1	mg/kg
NYTAGM	Methylene Chloride	0.1	mg/kg
NYTAGM	Naphthalene	13	mg/kg
NYTAGM-BG	Nickel	29	mg/kg
NYTAGM	Nitrobenzene	0.2	mg/kg
NYTAGM	O-xylene	1.2	mg/kg
NYTAGM	PAH	10000	ug/kg
NYTAGM	PCB	1000	ug/kg

TABLE 4.1-2 SOIL GUIDANCE USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Criteria Type	Constituent	Comparison Criteria	Unit
NYTAGM	P-Chloroaniline	0.22	mg/kg
NYTAGM	Pentachlorophenol	1	mg/kg
NYTAGM	Phenanthrene	50	mg/kg
NYTAGM	Phenol	0.03	mg/kg
NYTAGM	Pyrene	50	mg/kg
NY Guidance	RDX	64	mg/kg
NYTAGM-BG	Selenium	2.2	mg/kg
NYTAGM-BG	Silver	4.9	mg/kg
NYTAGM	Tetrachloroethene	1.4	mg/kg
NYTAGM-BG	Thallium	0.5	mg/kg
NYTAGM	Toluene	1.5	mg/kg
NYTAGM	Trans-1,2-dichloroethene	0.3	mg/kg
NYTAGM	Trichloroethylene	0.7	mg/kg
NYTAGM	Vanadium	150	mg/kg
NYTAGM	Vinyl Chloride	0.2	mg/kg
NYTAGM	Xylenes, Total	1.2	mg/kg
NYTAGM-BG	Zinc	76	mg/kg

NYTAGM Guidance value from NYSDEC TAGM 4046 (NYSDEC 1994a).

NYTAGM-US: eastern United States background concentration from NYSDEC TAGM 4046 (NYSDEC 1944a).

NYTAGM-B: average background concentration from 1998 Phase I RI background soil sampling locations.

NYTAGM-BG: Site-specific background concentration derived for metals on CWM property (Golder 1991b).

NY Guidance: Guidance value from NYSDEC TAGM 3028 (NYSDEC 1992).

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TABLE 4.1-3 GROUND-WATER GUIDANCE CRITERIA USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Criteria Type	Constituent	Comparison Criteria	Unit
NY Standard	1,1,1-Trichloroethane	5	ug/l
NY Standard	1,1,2,2-Tetrachloroethane	5	ug/l
NY Standard	1,1,2-Trichloroethane	5	ug/l
NY Standard	1,1-Dichloroethane	5	ug/l
NY Standard	1,1-Dichloroethylene	5	ug/l
NY Standard	1,2,4-Trichlorobenzene	5	ug/l
NY Standard	1,2,4-Trimethylbenzene	5	ug/l
NY Standard	1,2-Dibromo-3-chloropropane (DBCP)	5	ug/l
NY Standard	1,2-Dichlorobenzene	4.7	ug/l
NY Standard	1,2-Dichloroethane	5	ug/l
NY Standard	1,2-Dichloroethene, Total	5	ug/l
NY Standard	1,2-Dichloropropane	5	ug/l
NY Standard	1,2-Diphenylhydrazine	0	ug/l
NY Standard	1,3,5-Trinitrobenzene	5	ug/l
NY Standard	1,4-Dichlorobenzene	4.7	ug/l
NY Standard	2,2'-Oxybis(1-chloropropane)	5	ug/l
NY Standard	2,4,6-Trinitrotoluene	5	ug/l
NY Standard	2,4-Dichlorophenol	1	ug/l
NY Standard	2,4-Dinitrotoluene	5	ug/l
NY Standard	2,6-Dinitrotoluene	5	ug/l
NY Guidance	2-Butanone	50	ug/l
NY Guidance	2-Chloronaphthalene	10	ug/l
NY Standard	2-Nitroaniline	5	ug/l
NY Standard	2-Nitrotoluene	5	ug/l
NY Standard	3,3'-Dichlorobenzidine	5	ug/l
NY Standard	3-Nitroaniline	5	ug/l
NY Standard	3-Nitrotoluene	5	ug/l
NY Standard	4,4'-DDD	0	ug/l
NY Standard	4,4'-DDE	0	ug/l
NY Standard	4,4'-DDT	0	ug/l
NY Standard	4-Nitrotoluene	5	ug/l
NY Guidance	Acenaphthene	20	ug/l
NY Guidance	Acetone	50	ug/l
NY Standard	Acrylamide	5	ug/l
NY Standard	Acrylonitrile	5	ug/l
NY Standard	Alachlor	35	ug/l
NY Guidance	Aldicarb Sulfone	2	ug/l
NY Standard	Aldrin	0	ug/l
NY Standard	Alpha-BHC	0	ug/l
NY Guidance	Anthracene	50	ug/l
NY Guidance	Antimony	3	ug/l
NY Standard	Aroclor 1016	0.1	ug/l
NY Standard	Aroclor 1221	0.1	ug/l
NY Standard	Aroclor 1232	0.1	ug/l
NY Standard	Aroclor 1242	0.1	ug/l
NY Standard	Aroclor 1248	0.1	ug/l
NY Standard	Aroclor 1254	0.1	ug/l
NY Standard	Aroclor 1260	0.1	ug/l
NY Standard	Arsenic	25	ug/l
NY Standard	Atrazine	7.5	ug/l
NY Standard	Azobenzene	5	ug/l
NY Standard	Barium	1000	ug/l
NY Guidance	Benz[a]anthracene	0.002	ug/l

TABLE 4.1-3 GROUND-WATER GUIDANCE CRITERIA USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Criteria Type	Constituent	Comparison Criteria	Unit
NY Standard	Benzene	0.7	ug/l
NY Standard	Benzidine	5	ug/l
NY Standard	Benzo[a]pyrene	0	ug/l
NY Guidance	Benzo[b]fluoranthene	0002	ug/l
NY Guidance	Benzo[k]fluoranthene	0.002	ug/l
NY Guidance	Benzyl Butyl Phthalate	50	ug/l
NY Guidance	Beryllium	3	ug/l
NY Standard	Beta-BHC	0	ug/l
NY Standard	Bis(2-chloroethoxy)methane	5	ug/l
NY Standard	Bis(2-chloroethyl) Ether	1	ug/l
NY Standard	Bis(2-ethylhexyl) Phthalate	50	ug/l
NY Standard	Boron	1000	ug/l
NY Standard	Bromacil	4.4	ug/l
NY Standard	Bromobenzene	5	ug/l
NY Guidance	Bromodichloromethane	50	ug/l
NY Guidance	Bromoform	50	ug/l
NY Standard	Bromomethane	5	ug/l
NY Standard	Butylate	50	ug/l
NY Standard	Cadmium	10	ug/l
NY Standard	Camphechlor	0	ug/l
NY Standard	Captan	18	ug/l
NY Standard	Carbon Tetrachloride	5	ug/l
NY Standard	Carboxin	50	ug/l
NY Standard	Chloramben	50	ug/l
NY Standard	Chlordane	0.1	ug/l
NY Standard	Chloride	250000	ug/l
NY Standard	Chlorobenzene	5	ug/l
NY Guidance	Chlorodibromomethane	50	ug/l
NY Standard	Chloroethane	5	ug/l
NY Standard	Chloroform	7	ug/l
NY Guidance	Chloromethane	5	ug/l
NY Standard	Chromium	50	ug/l
NY Standard	Chromium (hexavalent Compounds)	50	ug/l
NY Guidance	Chrysene	0.002	ug/l
NY Standard	Cis-1,3-dichloropropene	5	ug/l
NY Standard	Copper	200	ug/l
NY Standard	Cyanide	100	ug/l
NY Standard	Delta-BHC	0	ug/l
NY Standard	Dibromodichloromethane	5	ug/l
NY Standard	Dibromomethane	5	ug/l
NY Standard	Dicamba	0.44	ug/l
NY Standard	Dieldrin	0	ug/l
NY Guidance	Diethyl Phthalate	50	ug/l
NY Guidance	Dimethyl Phthalate	50	ug/l
NY Guidance	Dimethylformamide	50	ug/l
NY Guidance	Di-n-butyl Phthalate	50	ug/l
NY Guidance	Di-n-octyl Phthalate	50	ug/l
NY Standard	Diphenamid	50	ug/l
NY Guidance	Endothall	50	ug/l
NY Standard	Endrin	0	ug/l
NY Standard	Endrin Aldehyde	5	ug/l
NY Standard	Endrin Ketone	5	ug/l
NY Standard	Ethylbenzene	5	ug/l

TABLE 4.1-3 GROUND-WATER GUIDANCE CRITERIA USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Criteria Type	Constituent	Comparison Criteria	Unit
NY Standard	Ethylenethiourea	0	ug/l
NY Standard	Ferbam	4.2	ug/l
NY Guidance	Fluoranthene	50	ug/l
NY Guidance	Fluorene	50	ug/l
NY Standard	Gamma-BHC	0	ug/l
NY Standard	Heptachlor	0	ug/l
NY Standard	Heptachlor Epoxide	0	ug/l
NY Standard	Hexachloro-1,3-butadiene	5	ug/l
NY Standard	Hexachlorobenzene	0.35	ug/l
NY Standard	Hexachlorocyclopentadiene	5	ug/l
NY Standard	Hexachloroethane	5	ug/l
NY Guidance	Hexazinone	50	ug/l
NY Guidance	Indeno[1,2,3-cd]pyrene	0.002	ug/l
NY Standard	Iron	300	ug/l
NY Guidance	Isophorone	50	ug/l
NY Standard	Lead	25	ug/l
NY Standard	Magnesium	35000	ug/l
NY Standard	Malathion	7	ug/l
NY Standard	Manganese	300	ug/l
NY Standard	MCPA (2-methyl-4-chlorophenoxyacetic Acid)	0.44	ug/l
NY Standard	M-dichlorobenzene	5	ug/l
NY Standard	M-Dinitrobenzene	5	ug/l
NY Standard	Mercury	2	ug/l
NY Standard	Methoxychlor	35	ug/l
NY Standard	Methyl Methacrylate	50	ug/l
NY Guidance	Methyl n-butyl ketone	50	ug/l
NY Standard	Methylene Chloride	5	ug/l
NY Standard	Metribuzin	50	ug/l
NY Standard	Mirex	5	ug/l
NY Guidance	Naphthalene	10	ug/l
NY Standard	Nitrilotriacetic Acid	3	ug/l
NY Standard	Nitrobenzene	5	ug/l
NY Standard	Nitrogen, Ammonia	2000	ug/l
NY Standard	Nitrogen, Nitrate	10000	ug/l
NY Guidance	N-nitrosodiphenylamine	50	ug/l
NY Standard	O-xylene	5	ug/l
NY Standard	P-Chloroaniline	5	ug/l
NY Standard	Phenanthrene	50	ug/l
NY Standard	Phenol	1	ug/l
NY Standard	P-Nitroaniline	5	ug/l
NY Standard	Prometon	50	ug/l
NY Standard	Propachlor (2-chloro-n-(1-methylethy)-n-phenylac	35	ug/l
NY Standard	Propazine	16	ug/l
NY Standard	Propham	50	ug/l
NY Guidance	Pyrene	50	ug/l
NY Guidance*	RDX	3.2	ug/l
NY Standard	Selenium	10	ug/l
NY Standard	Silver	50	ug/l
NY Standard	Simazine	50	ug/l
NY Standard	Sodium	20000	ug/l
NY Standard	Styrene	5	ug/l
NY Standard	Sulfate	250000	ug/l
NY Standard	Tebuthiuron	50	ug/l

TABLE 4.1-3 GROUND-WATER GUIDANCE CRITERIA USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Criteria Type	Constituent	Comparison Criteria	Unit
NY Standard	Terbacil	50	ug/l
NY Guidance	Terbufos	0.09	ug/l
NY Standard	Tetrachloroethene	5	ug/l
NY Guidance	Thallium	4	ug/l
NY Standard	Thiram	1.8	ug/l
NY Standard	Toluene	5	ug/l
NY Standard	Trans-1,3-dichloropropene	5	ug/l
NY Standard	Trichloroethylene	5	ug/l
NY Standard	Trifluralin	35	ug/l
NY Standard	Vinyl Chloride	5	ug/l
NY Standard	Xylenes, Total	5	ug/l
NY Standard	Zinc	300	ug/l

NY Standard: Promulgated standards from NYSDEC Technical and Operational Guidance 1.1.1, Ambient Water Quality Standards and Guidance Values (NYSDEC 1993).

NY Guidance: Guidance values from NYSDEC Technical and Operational Guidance 1.1.1, Ambient Water Quality Standards and Guidance Values (NYSDEC 1993).

NY Guidance*: Guidance value from NYSDEC TAGM 3028 (NYSDEC 1992).

TABLE 4.1-4 SURFACE WATER GUIDANCE CRITERIA USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Criteria Type	Constituent	Comparison Criteria	Unit
NY Guidance	1,1,1,2-Tetrachlorroethane	5	ug/l
NY Standard	1,1,2-Trichloroethane	0.6	ug/l
NY Guidance	1,2,4,5-Tetrachlorobenzene	10	ug/l
NY Guidance	1,2-Dichloroethene, Total	5	ug/l
NY Guidance	1,2-Diphenylhydrazine	0.05	ug/l
NY Guidance	2,6-Dinitrotoluene	0.07	ug/l
NY Standard	4,4'-DDD	0.001	ug/l
NY Standard	4,4'-DDE	0.001	ug/l
NY Standard	4,4'-DDT	0.001	ug/l
NY Standard	Acenaphthene	20	ug/l
NY Guidance	Acrylonitrile	0.07	ug/l
NY Guidance	Alachlor	0.3	ug/l
NY Standard	Aldrin	0.001	ug/l
NY Standard	Aluminum	100	ug/l
NY Guidance	Aniline	1	ug/l
NY Guidance	Anthracene	1	ug/l
NY Guidance	Antimony	3	ug/l
NY Guidance	Aroclor 1016	0.0000006	ug/l
NY Guidance	Aroclor 1221	0.0000006	ug/l
NY Guidance	Aroclor 1232	0.0000006	ug/l
NY Guidance	Aroclor 1242	0.0000006	ug/l
NY Guidance	Aroclor 1248	0.0000006	ug/l
NY Guidance	Aroclor 1254	0.0000006	ug/l
NY Guidance	Aroclor 1260	0.0000006	ug/l
NY Standard	Arsenic	190	ug/l
NY Standard	Barium	1000	ug/l
NY Guidance	Benzene	6	ug/l
NY Guidance	Benz[a]anthracene	0.002	ug/l
NY Standard	Beryllium	11	ug/l
NY Standard	Benzidine	0.1	ug/l
NY Guidance	Benzisothiazole	50	ug/l
NY Guidance	Benzo[b]fluoranthene	0.002	ug/l
NY Guidance	Benzo[k]fluoranthene	0.002	ug/l
NY Guidance	Benzo[a]pyrene	0.0012	ug/l
NY Standard	Beryllium	11	ug/l
NY Standard	Bis(2-ethylhexyl) Phthalate	0.6	ug/l
NY Standard	Boron	10000	ug/l
NY Guidance	Bromodichloromethane	50	ug/l
NY Guidance	Bromoform	50	ug/l
NY Standard	Carbofuran	1	ug/l
NY Guidance	Carbon Tetrachloride	0.4	ug/l
NY Standard	Chlorobenzene	5	ug/l
NY Guidance	Chlorodibromomethane	50	ug/l
NY Standard	Chloroform	7	ug/l
NY Standard	Chromium (hexavalent Compounds)	11	ug/l
NY Guidance	Chrysene	0.002	ug/l
NY Standard	Cobalt	5	ug/l
NY Standard	Cyanide	5.2	ug/l
NY Standard	Demeton	0.1	ug/l
NY Standard	Dichlorobenzene (mixed Isomers)	5	ug/l
NY Standard	Dieldrin	0.001	ug/l
NY Guidance	Di-n-butyl Phthalate	50	ug/l
NY Standard	Endosulfan I	0.009	ug/l

TABLE 4.1-4 SURFACE WATER GUIDANCE CRITERIA USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Criteria Type	Constituent	Comparison Criteria	Unit
NY Standard	Endrin	0.002	ug/l
NY Guidance	Ethylbenzene	5	ug/l
NY Guidance	Fluoranthene	50	ug/l
NY Standard	Heptachlor	0.001	ug/l
NY Standard	Hexachloro-1,3-butadiene	1	ug/l
NY Guidance	Hexachlorobenzene	0.02	ug/l
NY Standard	Hydrazine	5	ug/l
NY Standard	Hydroquinone	2.2	ug/l
NY Standard	Iron	300	ug/l
NY Standard	Isodecyl Diphenyl Phosphate	1.7	ug/l
NY Guidance	Isophorone	50	ug/l
NY Standard	Malathion	0.1	ug/l
NY Standard	Mercury	0.2	ug/l
NY Standard	Mirex	0.001	ug/l
NY Standard	Naphthalene	10	ug/l
NY Standard	Nitrobenzene	30	ug/l
NY Guidance	N-nitrosodiphenylamine	50	ug/l
NY Standard	Pentachlorophenol	0.4	ug/l
NY Guidance	Phenanthrene	50	ug/l
NY Standard	Selenium	1	ug/l
NY Standard	Silver	0.1	ug/l
NY Guidance	Tetrachloroethene	1	ug/l
NY Standard	Thallium	8	ug/l
NY Guidance	Toluene	5	ug/l
NY Guidance	Trichloroethylene	11	ug/l
NY Standard	Triphenyl Phosphate	4	ug/l
NY Standard	Vanadium	14	ug/l
NY Standard	Zinc	30	ug/l

NY Standard: Promulgated standards from NYSDEC Technical and Operational Guidance 1.1.1, Ambient Water Quality Standards and Guidance Values (NYSDEC 1993).
NY Guidance: Guidance values from NYSDEC Technical and Operational Guidance 1.1.1, Ambient Water Quality Standards and Guidance Values (NYSDEC 1993).

Note that this is not the complete list of NY State guidance values, but only those for which constiuents were reported in the Phase I results.

TABLE 4.1-5 SEDIMENT GUIDANCE CRITERIA USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Source	Constituent	Comparison Criteria	Unit
NY Bioaccumulation	1,1,1,2-Tetrachloroethane	10.5	ug/kg
NY Bioaccumulation	1,1,2-Trichloroethane	21	ug/kg
NY Bioaccumulation	1,1-Dichloroethylene	0.7	ug/kg
NY Bioaccumulation	1,2-Dichloroethane	24.5	ug/kg
NY Bioaccumulation	4,4'-DDD	0.35	ug/kg
NY Bioaccumulation	4,4'-DDE	0.35	ug/kg
NY Bioaccumulation	4,4'-DDT	0.35	ug/kg
NY Chronic	Acenaphthene	4900	ug/kg
NY Bioaccumulation	Aldrin	3.5	ug/kg
NY Lowest Effects	Antimony	2	mg/kg
NY Bioaccumulation	Aroclor 1016	0.028	ug/kg
NY Bioaccumulation	Aroclor 1221	0.028	ug/kg
NY Bioaccumulation	Aroclor 1232	0.028	ug/kg
NY Bioaccumulation	Aroclor 1242	0.028	ug/kg
NY Bioaccumulation	Aroclor 1248	0.028	ug/kg
NY Bioaccumulation	Aroclor 1254	0.028	ug/kg
NY Bioaccumulation	Aroclor 1260	0.028	ug/kg
NY Lowest Effects	Arsenic	6	mg/kg
NY Bioaccumulation	Azobenzene	35	ug/kg
NY Bioaccumulation	Benz[a]anthracene	45.5	ug/kg
NY Bioaccumulation	Benzene	21	ug/kg
NY Chronic	Benzidine	0.105	ug/kg
NY Bioaccumulation	Benzo[a]pyrene	45.5	ug/kg
NY Bioaccumulation	Benzo[b]fluoranthene	45.5	ug/kg
NY Bioaccumulation	Benzo[k]fluoranthene	45.5	ug/kg
NY Bioaccumulation	Bis(2-chloroethyl) Ether	1.05	ug/kg
NY Chronic	Bis(2-ethylhexyl) Phthalate	6982.5	ug/kg
NY Lowest Effects	Cadmium	0.6	mg/kg
NY Chronic	Camphechlor	0.7	ug/kg
NY Chronic	Carbofuran	7	ug/kg
NY Bioaccumulation	Carbon Tetrachloride	21	ug/kg
NY Bioaccumulation	Chlordane	0.035	ug/kg
NY Chronic	Chlorobenzene	122.5	ug/kg
NY Chronic	Chlorpyrifos	185.5	ug/kg
NY Lowest Effects	Chromium	26	mg/kg
NY Bioaccumulation	Chrysene	45.5	ug/kg
NY Lowest Effects	Copper	16	mg/kg
NY Bioaccumulation	Dichlorobenzene (mixed Isomers)	420	ug/kg
NY Bioaccumulation	Dieldrin	3.5	ug/kg
NY Chronic	Endosulfan I	1.05	ug/kg
NY Bioaccumulation	Endrin	28	ug/kg
NY Chronic	Fluoranthene	35700	ug/kg
NY Bioaccumulation	Heptachlor	0.028	ug/kg
NY Bioaccumulation	Hexachloro-1,3-butadiene	10.5	ug/kg
NY Bioaccumulation	Hexachlorobenzene	5.25	ug/kg
NY Chronic	Hexachlorocyclopentadiene	154	ug/kg
NY Bioaccumulation	Indeno[1,2,3-cd]pyrene	45.5	ug/kg
NY Lowest Effects	Iron	20000	mg/kg
NY Chronic	Isodecyl Diphenyl Phosphate	14.945	ug/kg
NY Lowest Effects	Lead	31	mg/kg
NY Chronic	Malathion	0.7	ug/kg
NY Lowest Effects	Manganese	460	mg/kg
NY Lowest Effects	Mercury	0.15	mg/kg

TABLE 4.1-5 SEDIMENT GUIDANCE CRITERIA USED FOR DATA EVALUATION FOR THE 1998 PHASE I RI

Source	Constituent	Comparison Criteria	Unit
NY Bioaccumulation	Mirex	2.45	ug/kg
NY Lowest Effects	Nickel	16	mg/kg
NY Bioaccumulation	O-Toluidine	17.5	ug/kg
NY Chronic	Pentachlorophenol	1400	ug/kg
NY Chronic	Phenanthrene	4200	ug/kg
NY Lowest Effects	Silver	1	mg/kg
NY Bioaccumulation	Tetrachloroethene	28	ug/kg
NY Bioaccumulation	Trichloroethylene	70	ug/kg
NY Chronic	Triphenyl Phosphate	5.46	ug/kg
NY Bioaccumulation	Vinyl Chloride	2.45	ug/kg
NY Lowest Effects	Zinc	120	mg/kg

NY Bioaccumulation: Human health bioaccumulation guidance values for organic compounds from NYSDEC Technical Guidance for Screening Contaminated Sediments (NYSDEC 1994b).

NY Chronic: Benthic aquatic life chronic toxicity guidance value for organic compounds from NYSDEC Technical Guidance for Screening Contaminated Sediment (NYSDEC 1994b).

NY Lowest Effects: The metals concentration that can be tolerated by the majority of benthic organisms from NYSDEC Technical Guidance for Screening Contaminated Sediment (NYSDEC 1994b).

1.1.1, *Ambient Water Quality Standards and Guidance Values* (NYSDEC 1993). Table 4.1-2 lists the guidance values used for evaluation of ground-water results for the Phase I RI.

For analytes with no value listed in the State's guidance documents, no screening criteria were selected.

4.1.3 Surface Water

As discussed in the Work Plan, surface waters at the former LOOW are categorized as "Class B" and "Class C" water bodies. The best usage of Class B waters is for primary/secondary recreational contact and other uses, except as a source of water supply for drinking, culinary, or food processing purposes. For Class C water, the best usage is for fishing, primary/secondary recreational contact, and other uses, except as a source of water supply for drinking, culinary, or food processing purposes. The regulations (Part 703.5) list ground-water quality standards for specific substances. Guidance values were taken from the NYSDEC TOGS 1.1.1, *Ambient Water Quality Standards and Guidance Values* (NYSDEC 1993). These New York State water-quality standards and guidance values for Class B and C surface water were used for evaluation of data collected during the Phase I RI (Table 4.1-3).

4.1.4 Sediment

The NYSDEC Division of Fish and Wildlife and Division of Marine Resources developed the *Technical Guidance for Screening Contaminated Sediments* (NYSDEC 1994b) to establish criteria for the purpose of identifying contaminated sediments. Four levels of protection are listed for organic compounds: human health bioaccumulation, benthic aquatic life acute toxicity, benthic aquatic life chronic toxicity, and wildlife bioaccumulation. For the sediment criteria established for metals, two levels of protection (lowest and severe effect) are listed. The lowest effect level indicates the level of sediment contamination that can be tolerated by the majority of benthic organisms, but still can cause toxicity in a few species. The concentration at which pronounced disturbance of the sediment dwelling community may be expected is indicated by the severe effect level. The screening criteria used to evaluate the sediment data from this Phase I RI represent the most conservative of the concentrations established (generally the human health bioaccumulation criteria for organic compounds and the lowest effect level for inorganic analytes). As specified in the guidance, the criteria from the guidance were multiplied by the Total Organic Carbon (TOC) in the sediment of interest. The sitewide average value of 35 grams TOC per kg sediment (reported in samples collected during this Phase I RI) was used. Table 4.1-4 lists the guidance values used for evaluation of sediment results for the Phase I RI.

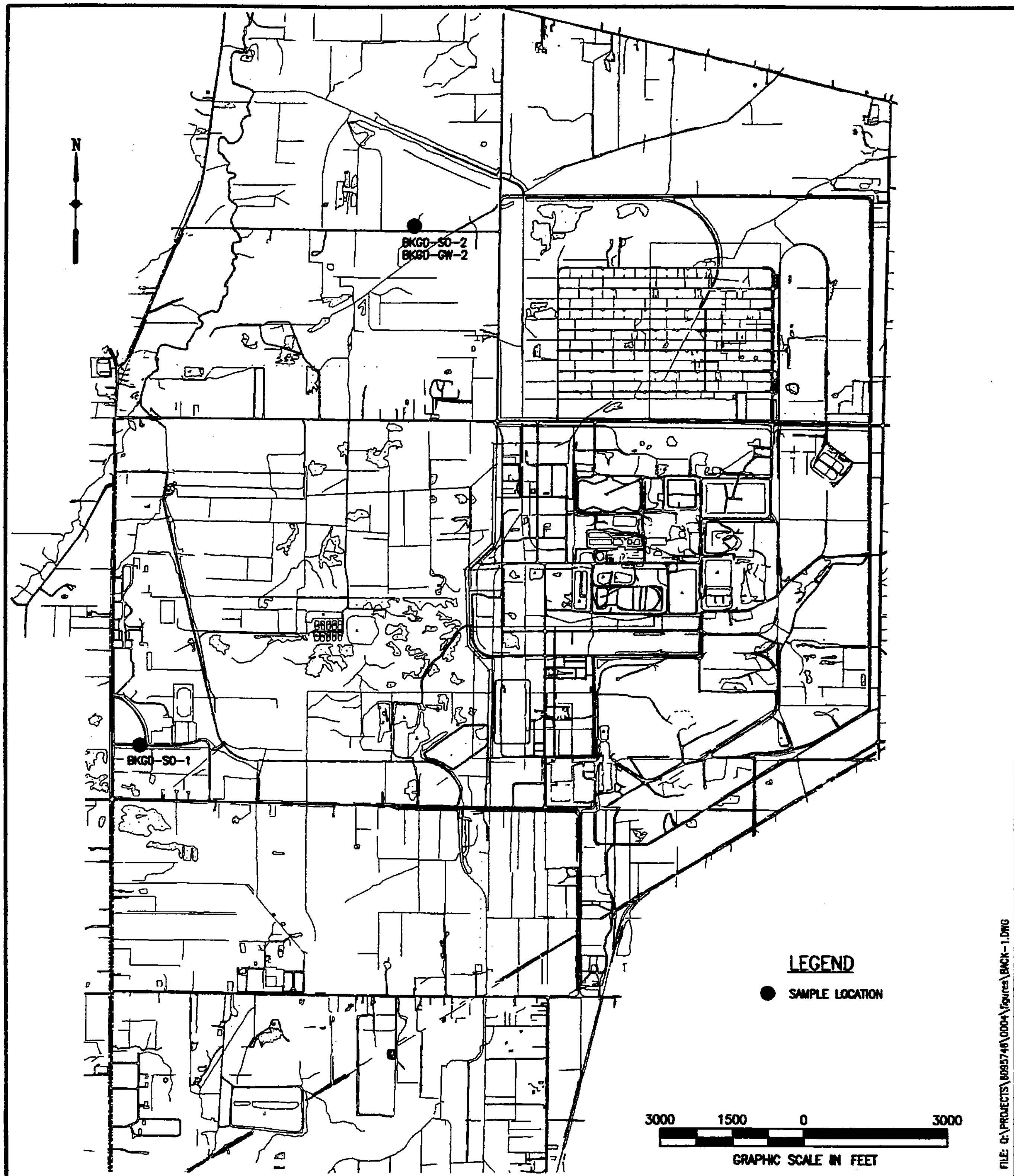
4.1.5 Sludge and Waste Water

Soil and ground water criteria were used in the evaluation of sludge and wastewater samples. In addition, sediment and surface water criteria were also used since the sludge and wastewater samples were collected from some underground lines may have the potential to eventually reach surface drainages.

4.2 BACKGROUND DATA

Background samples were collected to obtain data representing the general area of the former LOOW that was not impacted by site-specific operations. Background data for soil, ground water, sediment, and surface water were collected and used in conjunction with the RGC discussed in Section 4.1. Proposed background sample locations were discussed in the Work Plan; however, these locations were shifted and/or eliminated if property access could not be coordinated with the property owners. In addition, insufficient ground water was present at one of the sample locations to collect samples for all analyses. Therefore, fewer background samples were collected than proposed. The actual locations of samples collected for background purposes are shown in Figures 4.2-1 and 4.2-2. All background sample designations contain the prefix "BKGD". For the background sediment, ground-water, and surface water samples, the "BKGD" suffix is followed by a two character matrix identifier. The matrix identifiers are SD, GW, and SW for sediment, ground water, and surface water, respectively. The matrix identifier is followed by a sequential location number (i.e., -1). The last code represents the beginning depth of the collected sample (i.e., -12 for 12 ft bgs). Note that the background soil sample designations do not have a matrix code imbedded in the designation.

Analytical data corresponding to the soil and ground-water background samples are included in Tables 4.2-1, 4.2-2, and 4.2-3. If an established recommended clean-up objective was offered in TAGM 4046, this value was used. Background criteria were developed for the screening of soil metals data when site background was listed as the recommended soil clean-up objective in TAGM 4046. Background concentrations were established from three sources. The primary source was a site-specific trace metals evaluation performed on a portion of the former LOOW (Golder 1991b). These background concentrations are identified as action level type



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BACKGROUND SOIL AND GROUND-WATER SAMPLING LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	DAB	JBS	SMS	AS SHOWN	JULY 1999	60957.46	4.2-1

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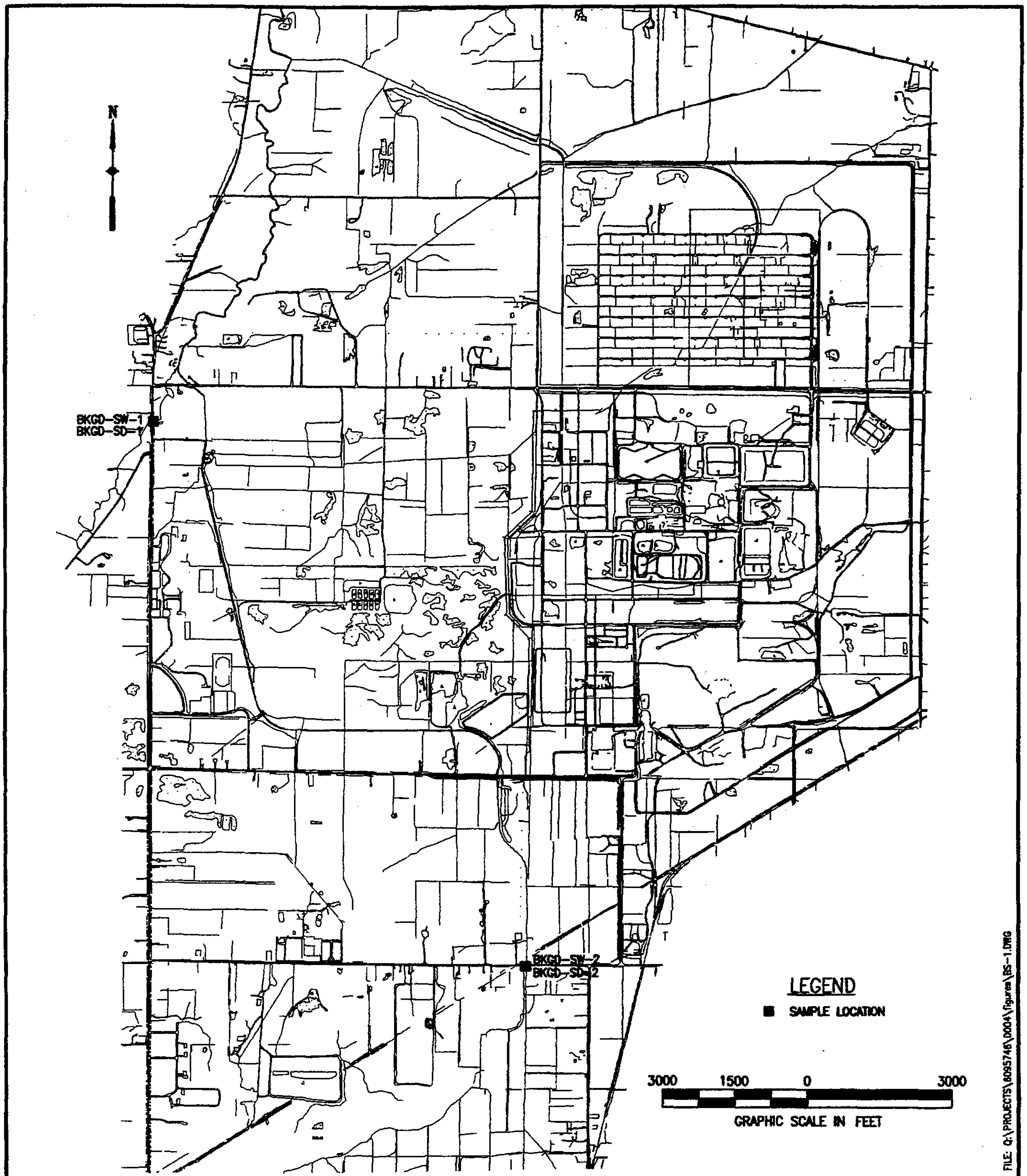

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BASEWIDE RI/FS
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NIAGARA COUNTY, NEW YORK

BACKGROUND SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	DAB	JBS	SMS	AS SHOWN	JULY 1999	60957.46	4.2-2

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Table 4.2-1 Background Samples, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-1-0-0.5	BKGD-1-12-14	BKGD-2-14	BKGD-2-2
E4035	PAH	UG/KG	10000	NYTAGM	378	288	652	1356

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

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Table 4.2-2 Background Samples, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-1-0-0.5	BKGD-1-12-14	BKGD-2-14	BKGD-2-2
E160.3	PERCENT MOISTURE	%			14.6	15.7	17.2	14.9
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	18400	10700	5260	13800
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.65 BN	0.63 BN	0.52 BN	0.5 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	3.8	3.7	3.1	3.8
SW6010	BARIUM	MG/KG	300	NYTAGM	148 E	97.9 E	58.5 E	129 E
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.77	0.4 B	0.12 B	0.71
SW6010	BORON	MG/KG			2.7 BN	3.5 BN	1.4 BN	
SW6010	CALCIUM	MG/KG			3890	54700	45400	7930
SW6010	CHROMIUM	MG/KG	50	NYTAGM	23.6 N	15.2 N	8 N	17.5 N
SW6010	COBALT	MG/KG	30	NYTAGM	12.8	12	4.9 B	10.1
SW6010	COPPER	MG/KG	50	NYTAGM-BG	32.9	38	20.6	30.7
SW6010	IRON	MG/KG	2000	NYTAGM	36400	25100	15000	29300
SW6010	LEAD	MG/KG	400	NYTAGM	8.1	5.7	3.6	11.8
SW6010	LITHIUM	MG/KG			27.1	25.3	12.6	17.9
SW6010	MAGNESIUM	MG/KG			6300	9780	8860	5120
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	699	687	605	455
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	28.5	19.9	10.2	22.9
SW6010	POTASSIUM	MG/KG			1420 N	1620 N	999 N	747 N
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG			0.23 BN	
SW6010	SODIUM	MG/KG			154	195	205	154
SW6010	VANADIUM	MG/KG	150	NYTAGM	30.7	20.1	11.3	26.2
SW6010	ZINC	MG/KG	76	NYTAGM-BG	66.1 N	266 N	30 N	40.4 N
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM				1.4
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM				0.65 P
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM				0.37 P
SW8151	PENTACHLOROPHENOL	UG/KG	1000	NYTAGM		110		
SW8270	BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	50000	NYTAGM		260		
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM				79
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM				8

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

Table 4.2-2 Background Samples, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-1-0-0.5	BKGD-1-12-14	BKGD-2-14	BKGD-2-2
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM				16
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM				19
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	2.5	1.6	4.3	25
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM			4.1	16
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	0.74		0.53	9.6
SW8310	CHRYSENE	UG/KG	400	NYTAGM		1.6		17
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM				2.7
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	2.3		1.3	41
SW8310	FLUORENE	UG/KG	50000	NYTAGM				2.9
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM				8.8
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM			5.5	35
SW8310	PYRENE	UG/KG	50000	NYTAGM	1.5		2.8	31

Note: F) Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cel nts, sample designations, data qualifiers, and acronyms.

Table 4.2-3 Background Samples, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-GW-02
SW6010	ALUMINUM	D	UG/L			167 B*
SW6010	ALUMINUM	T	UG/L			30300 *
SW6010	ANTIMONY	D	UG/L	3	NYGUIDANCE	1.7 B
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	4.3 B
SW6010	ARSENIC	D	UG/L	25	NYSTANDARD	2.7 B
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD	19.5
SW6010	BARIUM	D	UG/L	1000	NYSTANDARD	32.8 B
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	149 B
SW6010	BERYLLIUM	T	UG/L	3	NYGUIDANCE	0.34 B
SW6010	BORON	D	UG/L	1000	NYSTANDARD	44.5 B
SW6010	BORON	T	UG/L	1000	NYSTANDARD	78.7 B
SW6010	CALCIUM	D	UG/L			149000
SW6010	CALCIUM	T	UG/L			474000
SW6010	CHROMIUM	T	UG/L	50	NYSTANDARD	35.9 *
SW6010	COBALT	T	UG/L			13.7 B
SW6010	COPPER	T	UG/L	200	NYSTANDARD	120 E
SW6010	IRON	T	UG/L	300	NYSTANDARD	58300 *
SW6010	LEAD	T	UG/L	25	NYSTANDARD	16.3
SW6010	LITHIUM	D	UG/L			74
SW6010	LITHIUM	T	UG/L			140
SW6010	MAGNESIUM	D	UG/L	35000	NYSTANDARD	181000
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	233000
SW6010	MANGANESE	D	UG/L	300	NYSTANDARD	280
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	3040
SW6010	NICKEL	T	UG/L			45.9
SW6010	POTASSIUM	D	UG/L			4940 EN
SW6010	POTASSIUM	T	UG/L			11400 EN
SW6010	SELENIUM	D	UG/L	10	NYSTANDARD	3.1 B
SW6010	SELENIUM	T	UG/L	10	NYSTANDARD	6.4
SW6010	SODIUM	D	UG/L	20000	NYSTANDARD	86300
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	102000

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

Table 4.2-3 Background Samples, Summary of
Detected Analytes in Ground Water
(Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-GW-02
SW6010	VANADIUM	T	UG/L			60.1
SW6010	ZINC	T	UG/L	300	NYSTANDARD	134
SW7470	MERCURY	D	UG/L	2	NYSTANDARD	0.15 B

Note: F ...) Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cel ... nts, sample designations, data qualifiers, and acronyms.

"NYTAGM-BG" in the "hits only" tables located in Chapters 4 through 12. If a site-specific background metals concentration was not available from the trace metals evaluation, a background concentration was obtained from the list of Eastern U.S. background concentrations in TAGM 4046. These values are identified as action level type "NYTAGM-US" in the data tables. If neither a site-specific nor an Eastern U.S. background metals concentration was available, an average of the reported concentrations from the laboratory analysis of samples collected from background soil locations during the Phase I RI was used as the guidance criteria. For analytes with no value listed in the State's guidance documents, no screening criteria were selected.

Sediment and surface water background samples collected during this Phase I RI represent locations upstream of the samples collected at Component 9 (surface drainages). These sample results are discussed in Chapter 13.

4.3 SITE-WIDE EVALUATION OF BORON, LITHIUM, AND EXPLOSIVES

As discussed in the Work Plan, boron, lithium, and explosives were the analytes used in this Phase I RI as DOD marker parameters (i.e., analytes representing the potential presence of DOD activities and potential impact to the area). Site-wide maps of these DOD marker analytes in soil, ground water and the remaining environmental media (surface water, sediment, wastewater, and sludge) were developed to identify areas where concentrations may be elevated or to detect trends in the data.

Boron was reported in 75 of the soil samples collected during the Phase I RI. Ten of the reported concentrations exceeded the averaged background concentration (10 mg/kg). The distribution of boron in soil (above background) is illustrated in Figure 4.3-1. The samples with the highest reported concentrations were generally located in areas of known DOD impact, such as the buried drum area in Area C and the Trash Pit area.

In ground water, boron was reported in 22 samples (Figure 4.3-2). Four of the concentrations of total boron exceeded 1,000 μg/L (the tap water Risked-Based Concentration established by EPA Region III). These samples were collected at the vicinity shops of the WWTP, the Nitration Houses, Waterline Construction Area 4 (near the Navy IPPP), and in the buried drum area in Area C.

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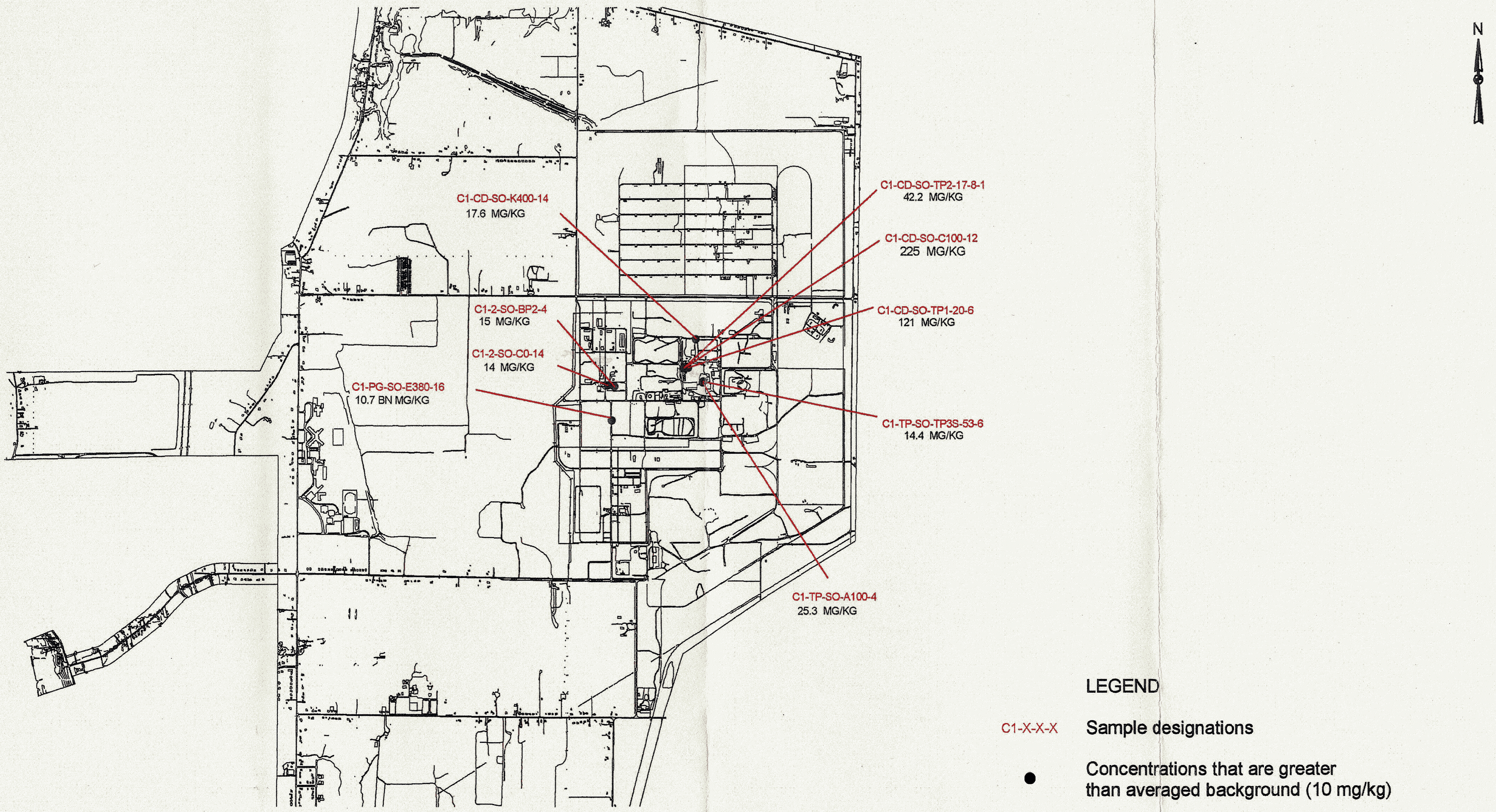

LEGEND

C1-X-X-X Sample designations

● Concentrations that are greater than averaged background (10 mg/kg)

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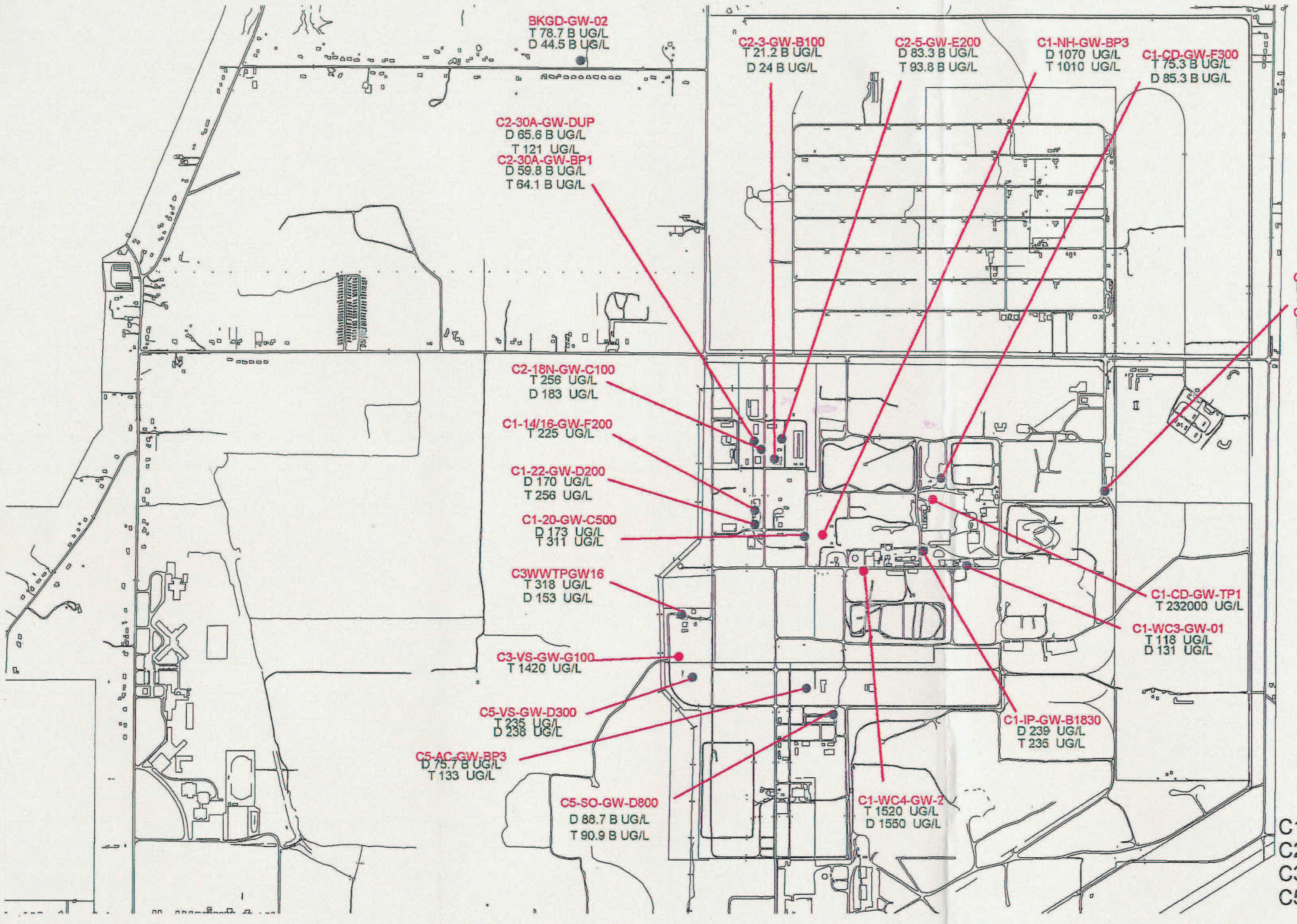
BORON REPORTED IN SOIL

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

DATE: JULY 1999

FIGURE: 4.3-1



N

LEGEND

- ● Concentration less than 1000 ug/L
- ● Concentration greater than 1000ug/L
- T Total concentration
- D Dissolved Concentration
- C1-X-GW-X Ground-water Sample collected from Component 1
- C2-X-GW-X Ground-water Sample collected from Component 2
- C3-X-GW-X Ground-water Sample collected from Component 3
- C5-X-GW-X Ground-water Sample collected from Component 5

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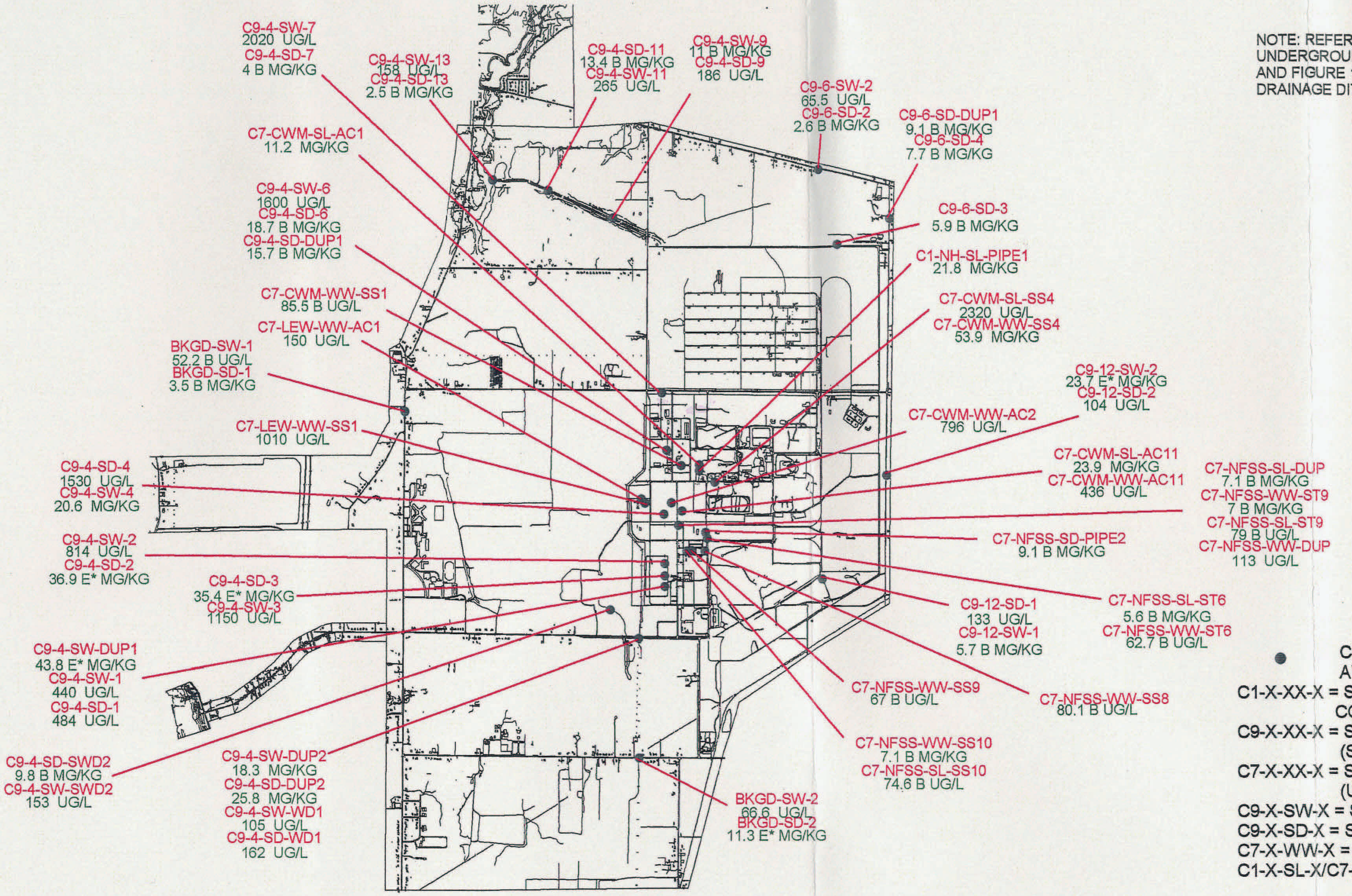
EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BORON REPORTED IN GROUND WATER	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	DATE: JULY 1999 FIGURE: 4.3-2

NOTE: REFER TO FIGURE 11-1 FOR UNDERGROUND LINE LOCATIONS AND FIGURE 13-1 FOR SURFACE DRAINAGE DITCH LOCATIONS.



LEGEND

● CONCENTRATIONS GREATER THAN AVERAGED BACKGROUND

C1-X-XX-X = SAMPLE COLLECTED FROM COMPONENT 1 (PIPE 1)

C9-X-XX-X = SAMPLES COLLECTED FROM COMPONENT 9 (SURFACE DRAINAGE) ie. C9-4-SD-1

C7-X-XX-X = SAMPLES COLLECTED FROM COMPONENT 7 (UNDERGROUND LINES) ie. C7-LEW-SL-AC1

C9-X-SW-X = SURFACE WATER SAMPLES

C9-X-SD-X = SEDIMENT SAMPLE

C7-X-WW-X = WASTEWATER SAMPLE

C1-X-SL-X/C7-X-SL-X = SLUDGE SAMPLE

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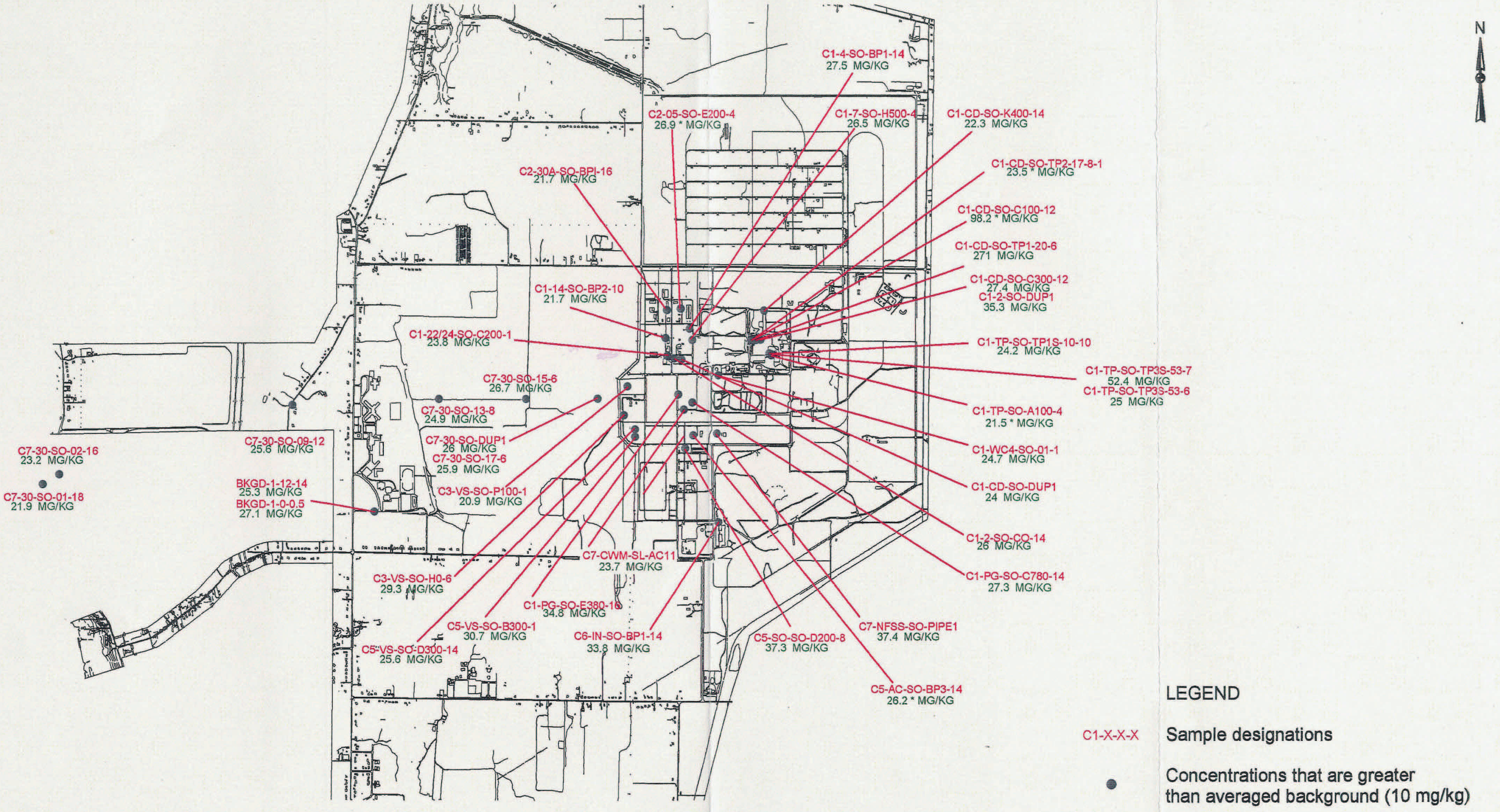
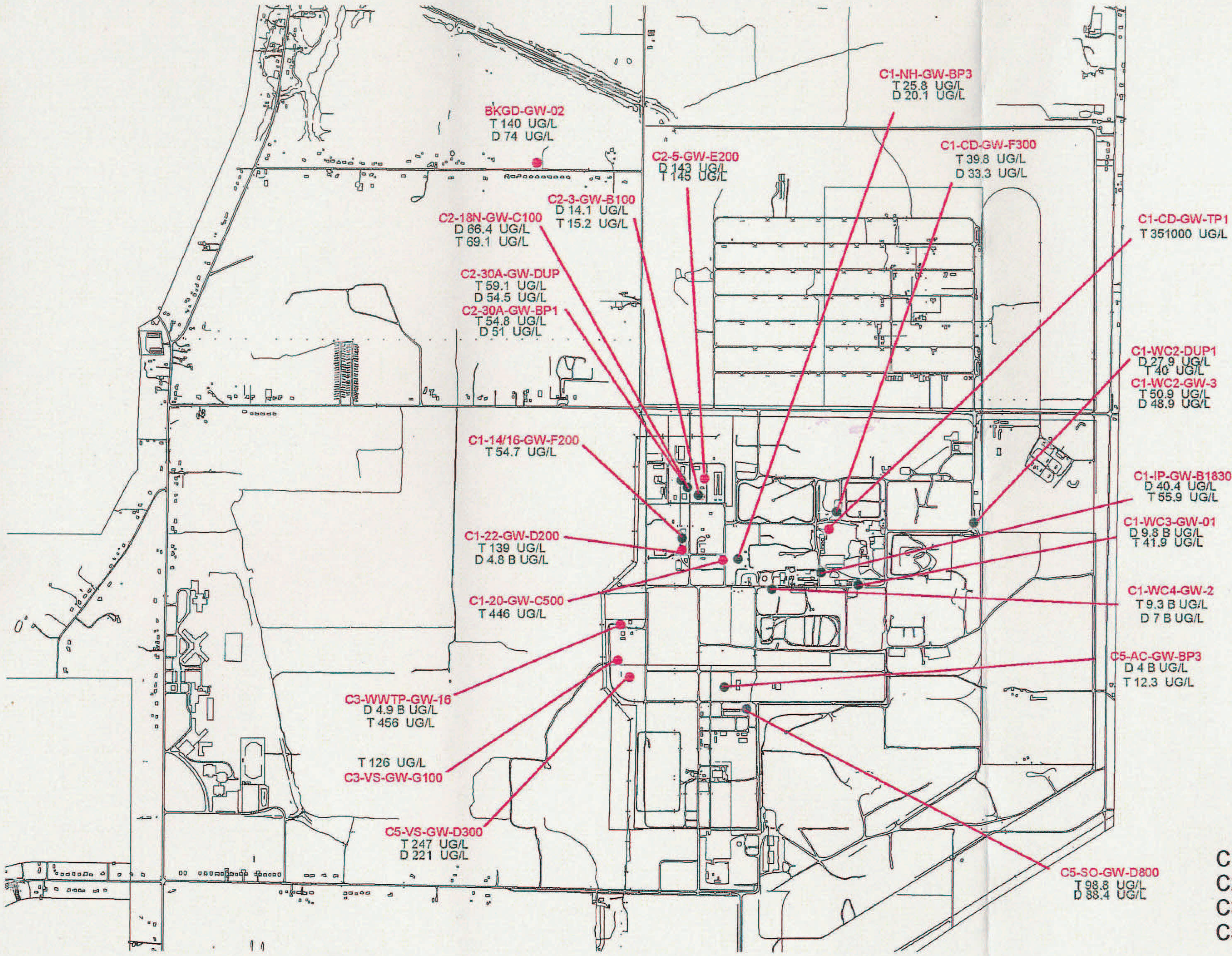
® EA ENGINEERING, SCIENCE, AND TECHNOLOGY	**BORON REPORTED IN OTHER MEDIA**	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	DATE: JULY 1999 FIGURE: 4.3-3



® EA ENGINEERING, SCIENCE, AND TECHNOLOGY	**LITHIUM REPORTED IN SOIL**	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	DATE: JULY 1999 FIGURE: 4.3-4



N

LEGEND

- ● Concentration less than RBC (73 ug/L)
- ● Concentration between RBC and background
- ● Concentration greater than averaged background(107 ug/L)

T Total concentration
D Dissolved Concentration
C1-X-GW-X Ground-water Sample collected from Component 1
C2-X-GW-X Ground-water Sample collected from Component 2
C3-X-GW-X Ground-water Sample collected from Component 3
C5-X-GW-X Ground-water Sample collected from Component 5

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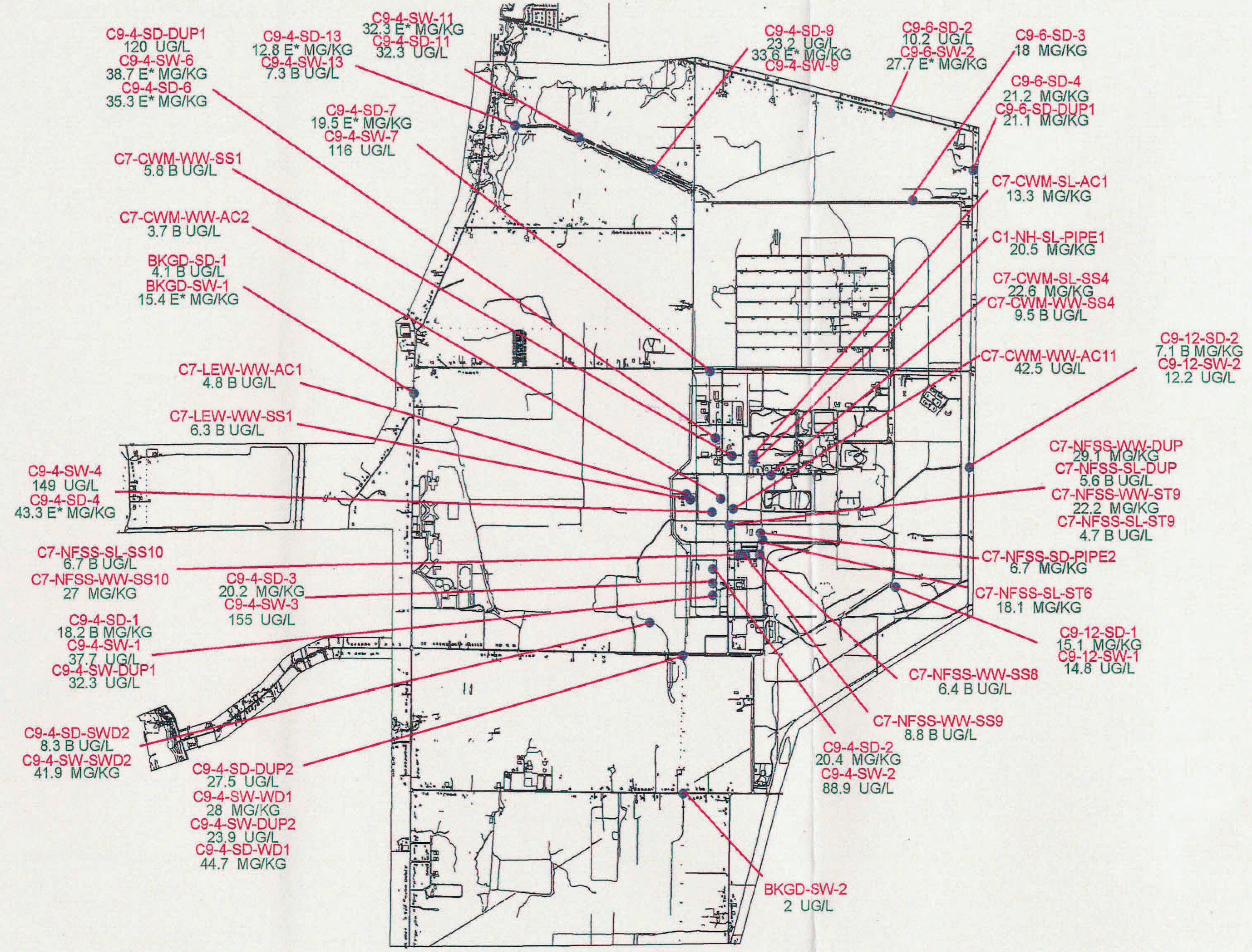
EA ENGINEERING, SCIENCE, AND TECHNOLOGY	LITHIUM REPORTED IN GROUND WATER	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	DATE: JULY 1999 FIGURE: 4.3-5

NOTE: REFER TO FIGURE 11-1 FOR UNDERGROUND LINE LOCATIONS AND FIGURE 13-1 FOR SURFACE DRAINAGE DITCH LOCATIONS.



LEGEND

● CONCENTRATIONS GREATER THAN AVERAGED BACKGROUND

C1-X-XX-X = SAMPLE COLLECTED FROM COMPONENT 1 (PIPE 1)

C9-X-XX-X = SAMPLES COLLECTED FROM COMPONENT 9 (SURFACE DRAINAGE) ie. C9-4-SD-1

C7-X-XX-X = SAMPLES COLLECTED FROM COMPONENT 7 (UNDERGROUND LINES) ie. C7-LEW-SL-AC1

C9-X-SW-X = SURFACE WATER SAMPLES

C9-X-SD-X = SEDIMENT SAMPLE

C7-X-WW-X = WASTEWATER SAMPLE

C1-X-SL-X/C7-X-SL-X = SLUDGE SAMPLE

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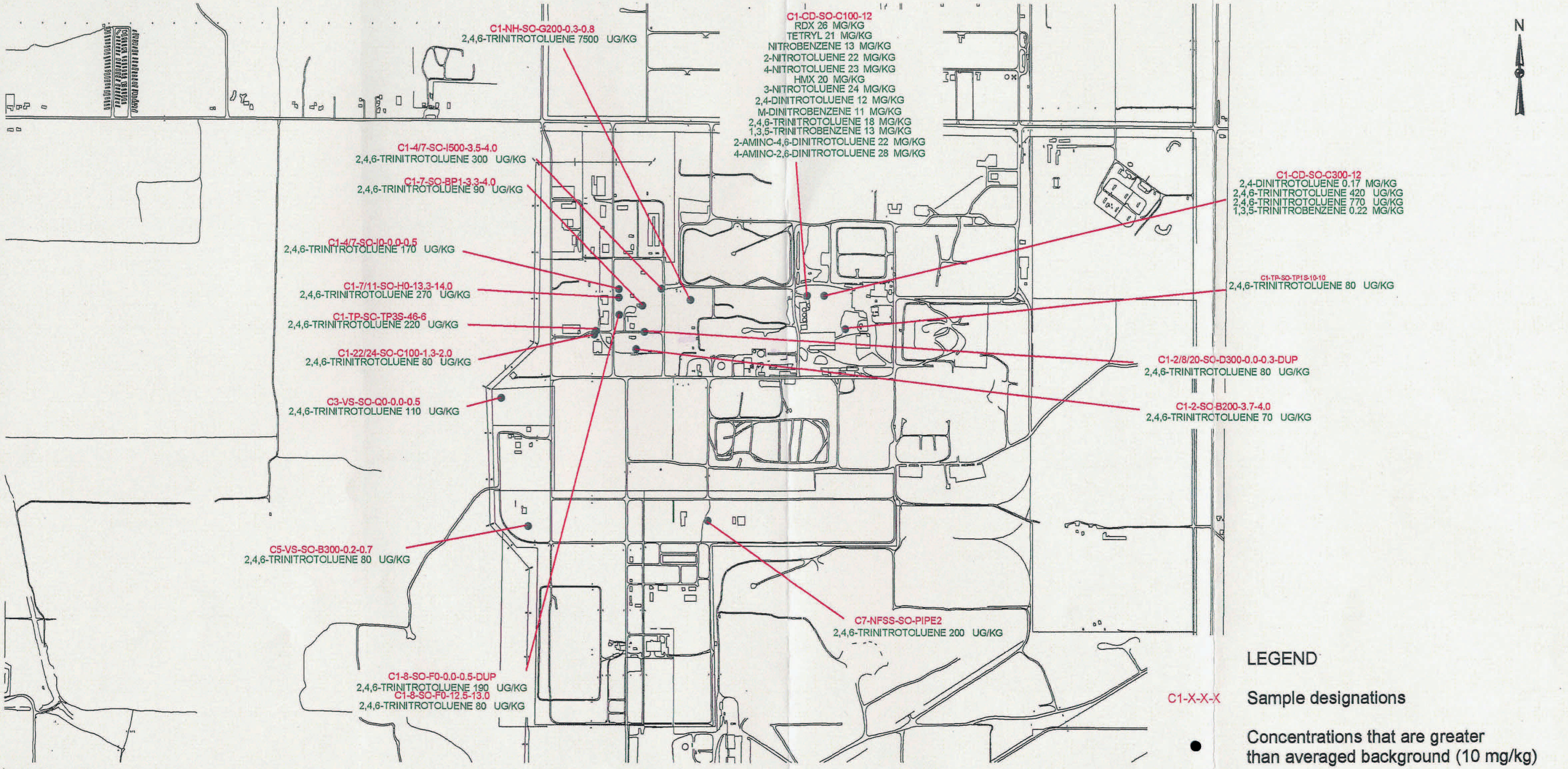
LITHIUM REPORTED IN OTHER MEDIA

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

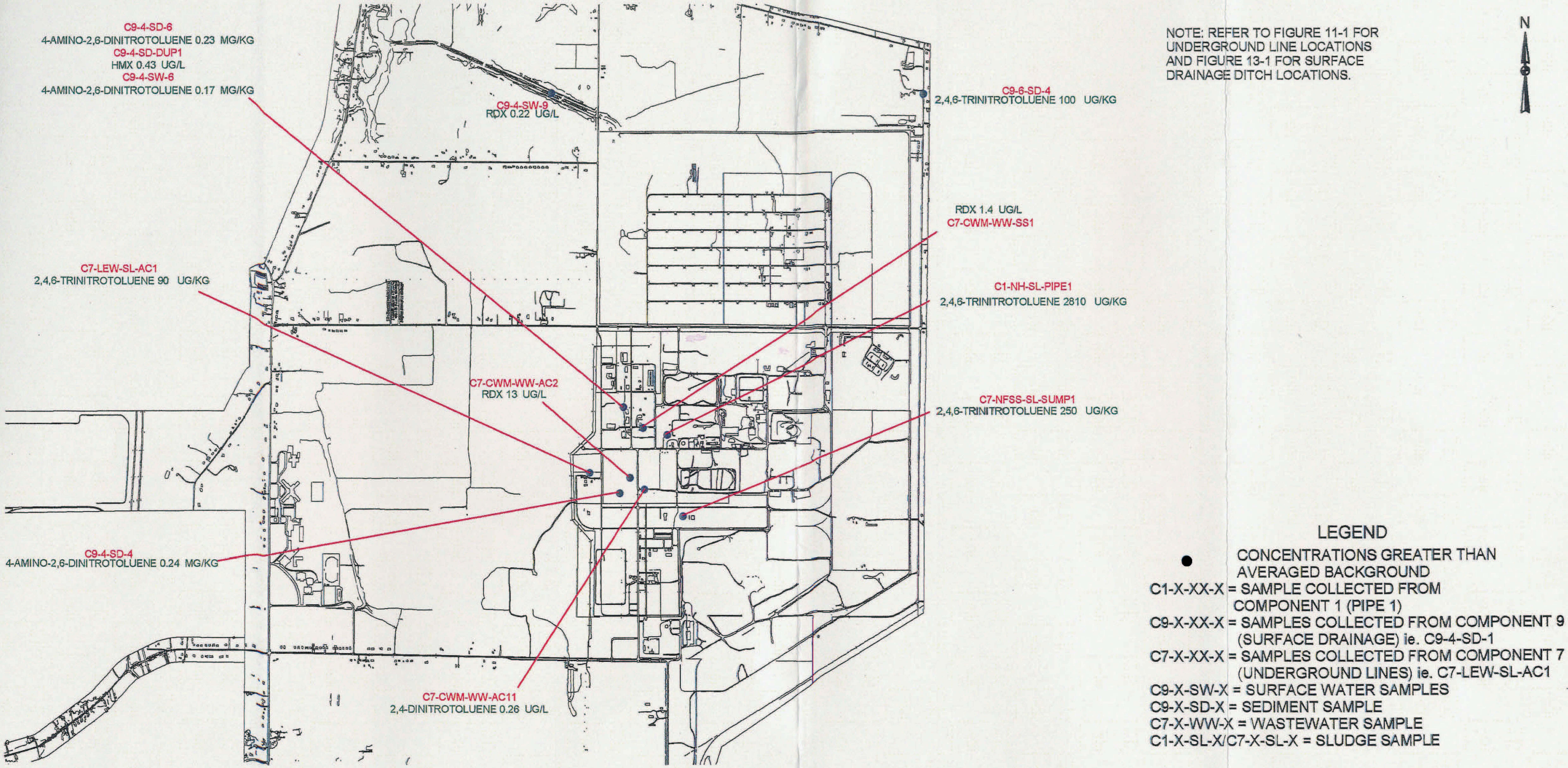
DATE: JULY 1999

FIGURE: 4.3-6



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	**EXPLOSIVES REPORTED IN SOIL**	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	DATE: JULY 1999 FIGURE: 4.3-7

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	**EXPLOSIVES REPORTED IN GROUND WATER**	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	DATE: JULY 1999 FIGURE: 4.3-8



NOTE: REFER TO FIGURE 11-1 FOR UNDERGROUND LINE LOCATIONS AND FIGURE 13-1 FOR SURFACE DRAINAGE DITCH LOCATIONS.

LEGEND

● CONCENTRATIONS GREATER THAN AVERAGED BACKGROUND

C1-X-XX-X = SAMPLE COLLECTED FROM COMPONENT 1 (PIPE 1)

C9-X-XX-X = SAMPLES COLLECTED FROM COMPONENT 9 (SURFACE DRAINAGE) ie. C9-4-SD-1

C7-X-XX-X = SAMPLES COLLECTED FROM COMPONENT 7 (UNDERGROUND LINES) ie. C7-LEW-SL-AC1

C9-X-SW-X = SURFACE WATER SAMPLES

C9-X-SD-X = SEDIMENT SAMPLE

C7-X-WW-X = WASTEWATER SAMPLE

C1-X-SL-X/C7-X-SL-X = SLUDGE SAMPLE

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EA ENGINEERING, SCIENCE, AND TECHNOLOGY

EXPLOSIVES REPORTED IN OTHER MEDIA

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

DATE: JULY 1999

FIGURE: 4.3-9

Boron reported in surface water, sediment, wastewater, and sludge samples are shown in Figure 4.3-3. It is useful to note trends in concentrations along drainage pathways.

Lithium was reported in 79 of the soil samples collected during this Phase I RI. The 39 samples with concentrations greater than the averaged background (20.73 mg/kg) are shown on Figure 4.3-4. Eight sample results exceeded 30 mg/kg, suggesting that the background concentration is actually closer to 30 mg/kg. Similar to the distribution of boron in soil, the highest concentrations of lithium were reported at the buried drum area in Area C and the Trash Pit area.

Lithium was reported in 22 ground-water samples (Figure 4.3-5). Eight of the reported concentrations exceeded the averaged background concentration of 107 μg/L. These samples were collected at the WWTP and its vicinity shops, the shops area on NFSS property, the buried drum area in Area C, AFP-68 (Process Areas 5, 20, and 22), and the downgradient background sample location.

Lithium reported in surface water, sediment, wastewater, and sludge samples are shown in Figure 4.3-6. It is useful to note trends in concentrations along drainage pathways.

The soil samples where explosives were reported are shown in Figure 4.3-7. TNT was reported more often than other explosives due to the greater number of samples analyzed for TNT. Screening for TNT was conducted on all soil samples using immunoassay analysis. A subset of samples was submitted for laboratory analysis of a larger explosive suite. TNT was reported in 18 samples. Other explosive analytes were reported in the samples collected from the buried drum area in Area C.

The explosives reported in ground water samples are shown in Figure 4.3-8. The concentrations generally did not exceed their respective screening criteria. Patterns or distributions were not observed for the analytes or their concentrations.

Explosives reported in surface water, sediment, wastewater, and sludge samples are shown in Figure 4.3-9. Patterns or distributions were not observed for the analytes or their concentrations.

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4.4 LABORATORY DATA EVALUATION

4.4.1 Laboratory Data Reports

As part of the data analysis process, the laboratory assigns qualifiers to the data that describe the results. The qualifiers help to assess whether the objectives defined in the QAPP were achieved for precision and accuracy, sample representativeness, data comparability, and data completeness (PARCC). The qualifiers are included in the data tables that summarize detected analytes (Chapters 5 through 13), as well as the summary data tables in Appendix C. A key to the data tables, including the laboratory-assigned data qualifiers, is presented in Table 4.1-1. The qualifiers, laboratory reports, and Quality Assurance/Quality Control (QA/QC) data were qualitatively evaluated in conjunction with the development of this report.

During the Phase I RI, 12 of the samples collected for analysis by the contract laboratory were split with USACE for analysis at their QA/QC laboratory. The results from the USACE laboratory are not yet available (July 1999). When these results become available, they may be submitted as an addendum to this report.

4.4.2 Comparison of Laboratory Data with Field Screening Results

As discussed in the Work Plan, laboratory data analysis was used to confirm the results of field screening. A minimum of 5 percent of the field screening samples were sent to the laboratory for confirmatory analysis. The comparison of field screening data with the corresponding laboratory results is discussed in Chapters 5 through 13 for each area investigated during the Phase I RI.

In general, the differences noted between analytes reported in screening samples and those reported in laboratory analytical samples were due to differences in achievable detection limits among the methods used. Lower detection limits were achievable for field screening of VOCs; therefore, more VOCs were reported in samples screened in the field than in samples analyzed by the laboratory. Conversely, the detection limit for TNT was higher for the field screening method than for the laboratory method, and TNT was reported in several laboratory samples where corresponding detections were not reported in the field. The field screening method for PAHs and PCB yielded a gross number for concentrations, whereas concentrations of individual PAHs and PCB Aroclors were reported by the laboratory. In addition, the field screening method for analysis of PAH and PCB is specific to a combination of PAHs and to a specific PCB Aroclor. The individual mix of PAHs and PCB within the sample may have a different response factor than the PAH mix or Aroclor used to develop the method. The sum of concentrations reported by the laboratory was generally lower than the reported screening concentration. This could be due in part to the fact that immunoassay analysis can report both false positives and false negatives, depending on matrix interferences and the presence and concentration of other contaminants. However, because the immunoassay analyses results were used for screening only, matrix spikes were not performed for the immunoassay analyses.

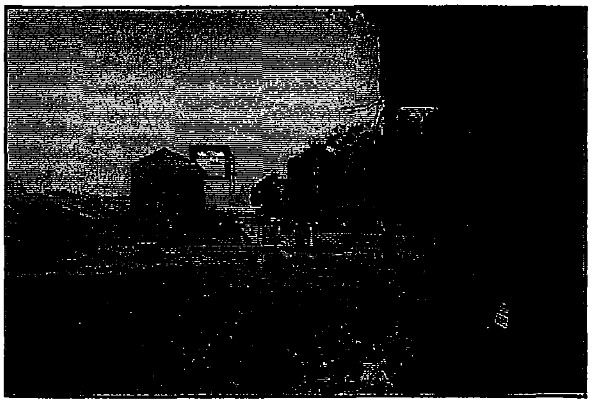
5. COMPONENT 1 (CWM) DATA RESULTS AND EVALUATION

5.1 NITRATION HOUSES

5.1.1 Site Background

There are three buildings currently on CWM property that were associated with the fifth production line of the former LOOW TNT plant. The buildings consist of a mononitration house, bi-trinitration house, and a fortifier house. These nitration houses were involved with producing TNT from raw materials, such as toluene and nitric and sulfuric acids. Storage tanks and above- and below-ground piping were located at each of the buildings and were used for transporting raw materials and wastes (EA 1998a).

5.1.2 Field Reconnaissance and Surface Features



Photograph 5.1-1 The acid fortifier house. The bi-trinitration house is in the foreground, and the mononitration house is in the background.

Photograph 5.1-2 Acid fume recovery lines.

During the Phase I RI, a site reconnaissance was performed prior to establishing a sampling grid at the nitration house area (Figure 5.1-1). The mononitration house, fortifier house, and bi-trinitration house were still standing (Photo 5.5-1). A detailed description of each building is available in the Work Plan and the initial site reconnaissance performed by Acres (Acres 1988). The acid fume recovery building foundation and rubble associated with the collapse of the acid fume recovery overhead pipelines were visible (Photo 5.1-2). It appeared as though the pipes had been filled with concrete. The water-filled pit located just southeast of the acid fume recovery foundation was still visible (Photo 5.1-3). It is believed to be a tank pit. One manhole, presumably associated with the former LOOW acid waste lines, was found just north of the rubble from the acid fume recovery building. During the

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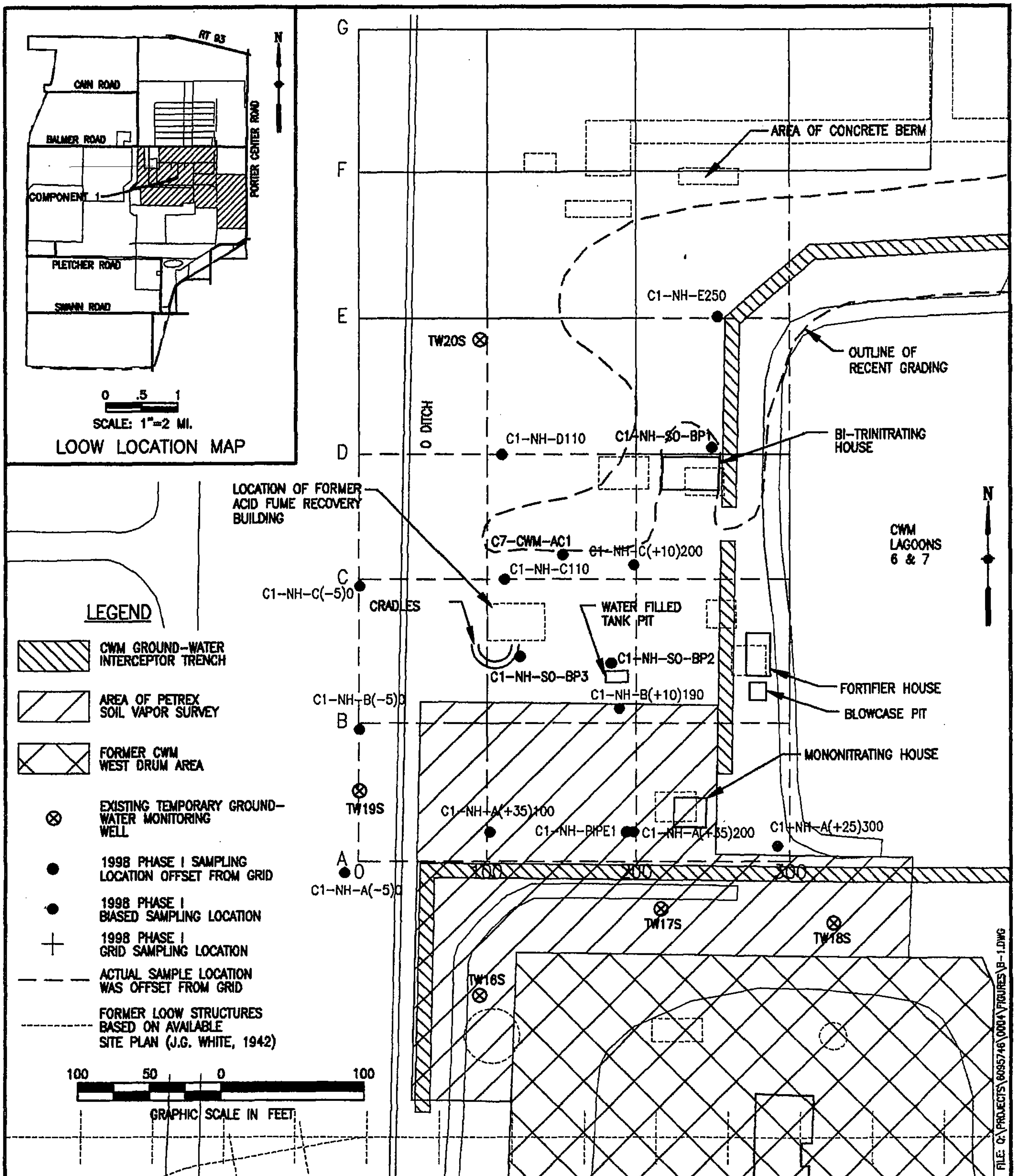

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BASEWIDE RI/FS
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COMPONENT 1 (CWM) FORMER LOOW NITRATION HOUSES SAMPLING GRID LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	BCR	FDV	SMS	AS SHOWN	JULY 1999	60957.46	5.1-1

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reconnaissance performed by Acres, two manholes were found in this area. Since that time, the northern manhole was destroyed, presumably during excavation by CWM. The area between the manhole and the bi-trinitration house was recently graded by CWM. An area devoid of undergrowth was observed west-northwest of the water-filled tank pit (location of BP3 on Figure 5.1-1).

Small concrete foundations, approximately 2 by 3 ft and 3.5 by 5 ft, were located off of the northeast corner of the bi-trinitration house and the mononitration house, respectively. These may have been associated with storage tanks used to support the activities at each building. A concrete berm was located approximately 200 ft north of the bi-trinitration house. This berm was presumably associated with the former LOOW wash house.

A capped metal stick-up and valve stick-up was observed approximately 25 ft west of the mononitration house (at location PIPE1 on Figure 5.1-1).

Photograph 5.1- 3 Liquid filled pit just south of the former acid fume recovery building.

The area surrounding the blow case pit, located just south of the fortifier house, was overgrown with cattails, and the pit was full of liquid.

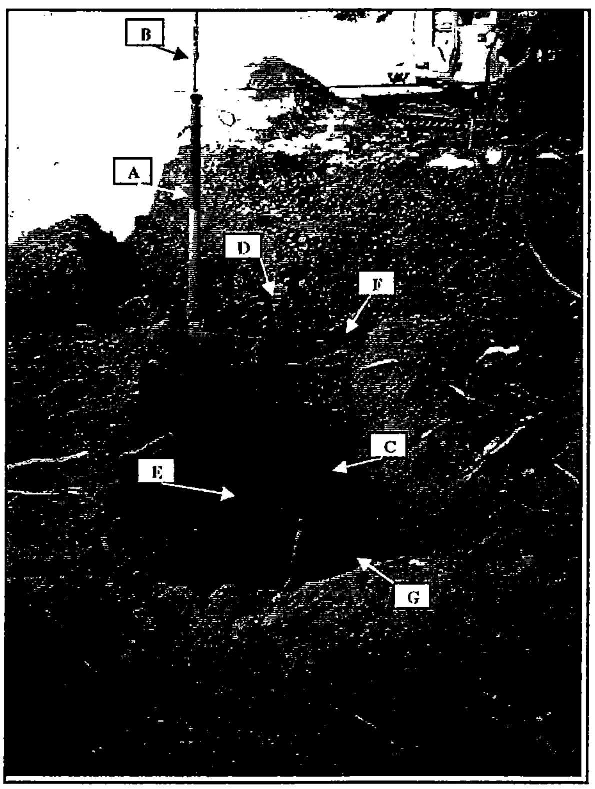
The nitration houses are located west and north of two Solid Waste Management Units (SWMUs) identified on CWM property during the RCRA Facility Assessment (RFA). The nitration houses are located north of the former West Drum Area, an area formerly used by CWM for drum storage, and west of CWM Lagoons 6 and 7. Ground-water interceptor trenches were installed by CWM south and east of the nitration houses to intercept potentially contaminated ground water from the former West Drum Area and the lagoons, respectively.

The ground surface in the nitration house area has some topographic relief, most likely related to re-grading during past site activities. The bi-trinitration house is at the topographic high of the sampling grid that was established at the site for this Phase I RI. It is estimated that the ground surface at the northern rows of the sampling grid is approximately 4 to 6 ft below the surface elevation of the bi-trinitration house. The northernmost row, the east-west trending G row, is located adjacent to a CWM storm water collection basin. South of the bi-trinitration house, the ground surface is generally flat. Boring locations to the southwest appear slightly lower (approximately 2 to 3 ft) than those borings at the bi-trinitration house.

The O Ditch runs north to south, between the north-south trending 0 and 100 rows in the west side of the sampling grid.

5.1.3 Trenching and Excavation

During the Phase I RI, an excavation was performed to evaluate whether an underground storage tank was associated with the vent pipe (western stick-up) and apparent valve (eastern stick-up) west of the mononitration house. Prior to excavating, a qualitative magnetometer survey was performed in the vicinity of the stick-ups. A survey grid with 5-ft grid intervals was established. Magnetometer sweeps were performed along the grid lines to evaluate for the presence of buried metal. A positive response, indicative of a buried metal mass, was reported in the vicinity of the stick-ups, with the greatest response on the north side of the pipes.



Photograph 5.1-4 Excavation of stick-up valve at the mononitration house.

The excavation was initiated at the base of the stick-ups. Photograph 5.1-4, looking west, shows the stepped excavation pit and the stick-ups (A and B on Photo) to the left in the background. The stick-ups descended 3 ft below ground surface (bgs). From this point, the vent stick-up (B on Photo) turned to the east and terminated into the valve stick-up. From the valve stick-up (A on Photo), a 1-in. diameter pipe emerged from the east side of the bottom of the valve stick-up, at 3 ft bgs, and trended to the east for approximately 6 in. Then, the pipe elbowed and trended to the north for approximately 14 in., elbowed again and trended to the east for 5.5 ft, and terminated at a north-south trending pipe of the same diameter (C on Photo and Figures 5.1-2 and 5.1-3). This north-south trending pipe was not excavated. A magnetometer sweep of the area north and south of the "T" did not indicate a large buried metal mass. An underground tank was not uncovered

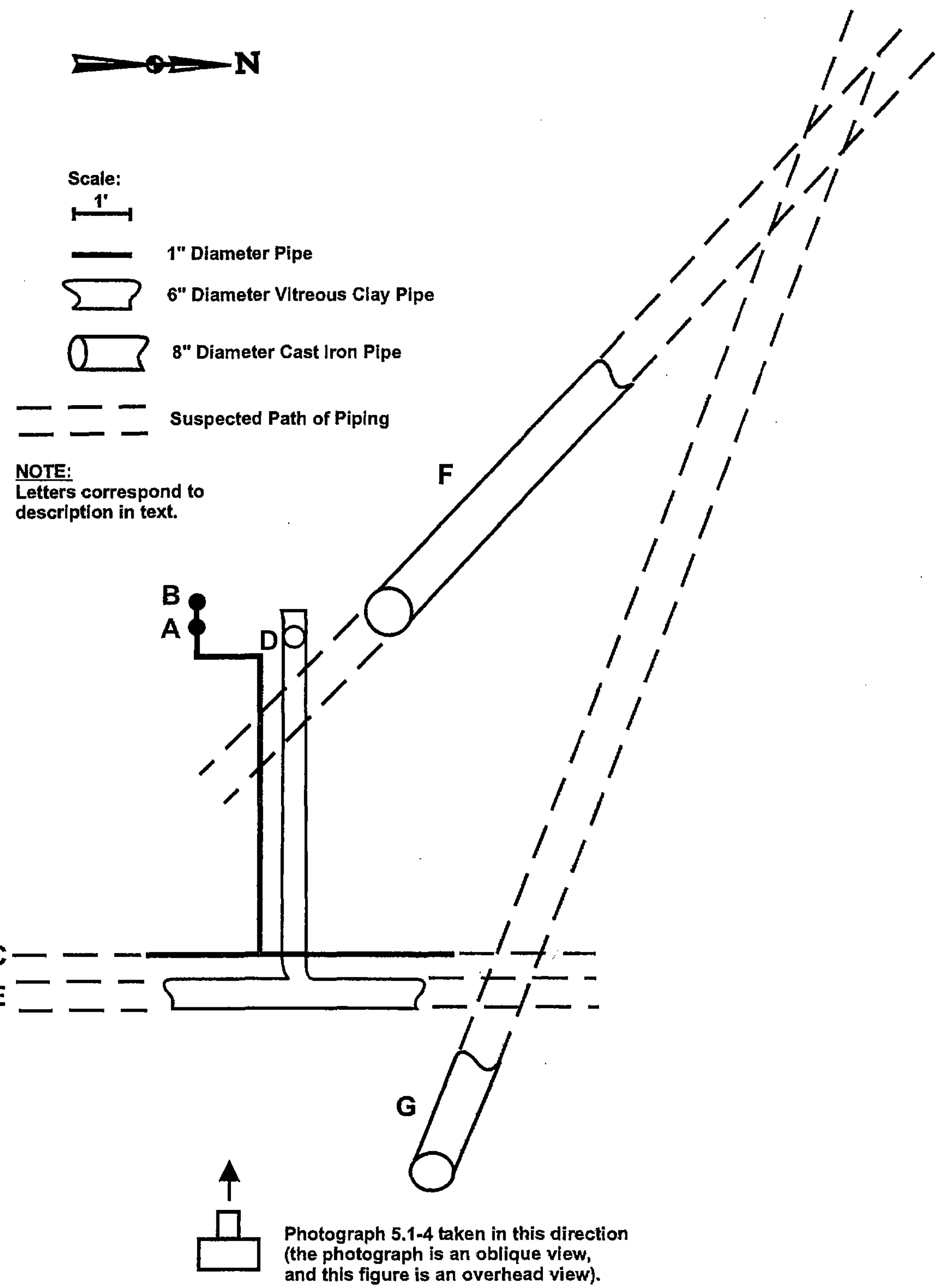


Figure 5.1-2. Overhead View of Stick-Up Valve Excavation (At Mononitration House).

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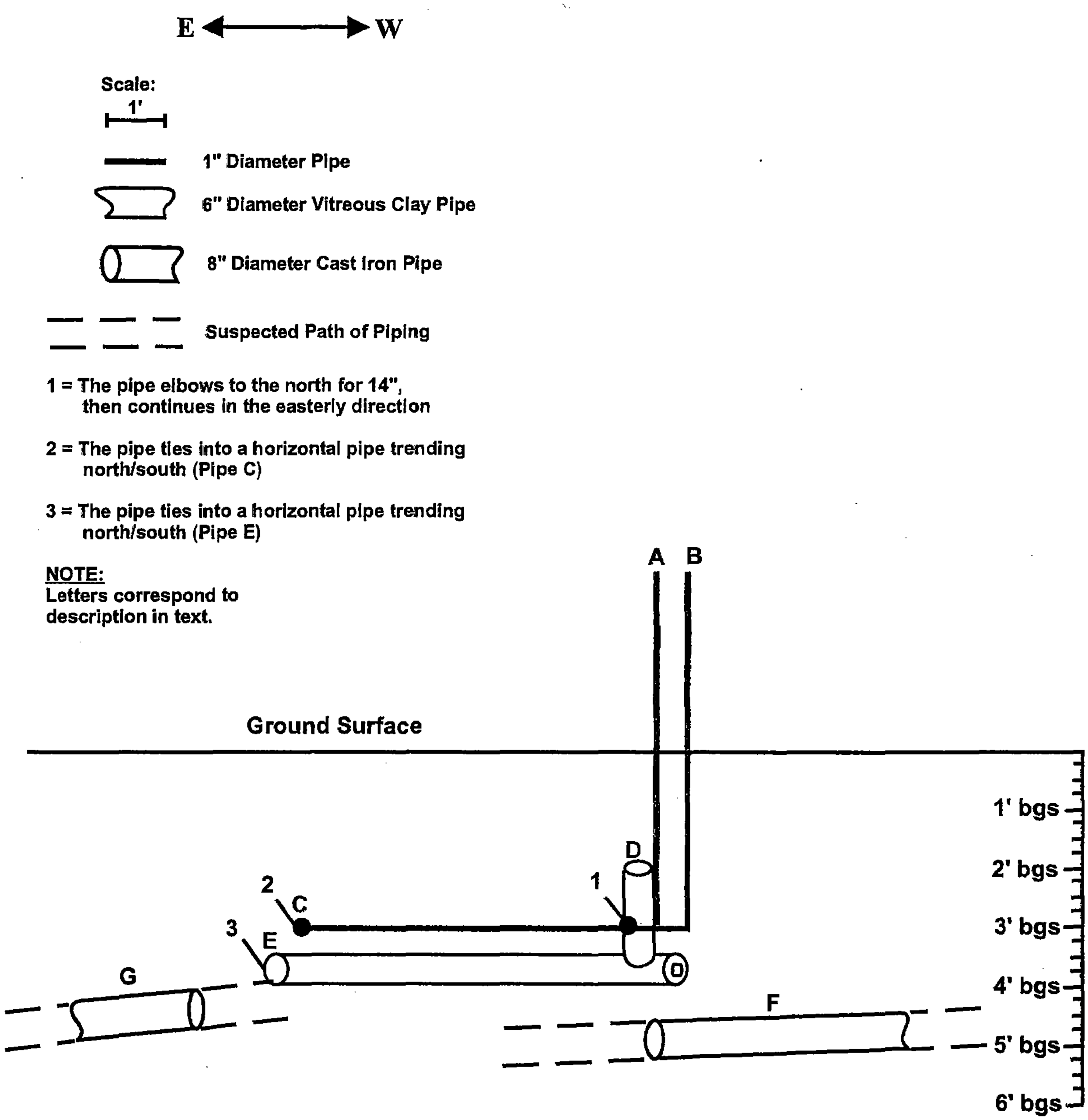

Figure 5.1-3. Side View (Facing South) of Stick-Up Valve Excavation (At Mononitration House).

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during the excavation. The pipeline may continue to the tank pit that was associated with the acid fume recovery building.

During excavation of the vent pipes, several other underground pipelines were unearthed. At approximately 2.5 ft bgs and 1.5 ft north of the stick-ups, a vertical, 6-in. diameter, vitreous clay pipe was encountered (D on Photo and Figures 5.1-2 and 5.1-3). The pipe descended to a depth of 4 ft bgs to an east-west trending "T." The west end of the "T" was broken and sealed with a concrete plug. The east side of the "T" trended east for 6 ft, ending in a north-south trending vitreous clay pipe (E on Photo and Figures 5.1-2 and 5.1-3). Approximately 3 ft north of the stick-ups, an 8-in. diameter cast iron pipe was unearthed (F on Photo and Figures). This pipe was trending northwest-southeast. Presumably this pipeline initiated the positive response in the magnetometer survey. A similar pipe was also unearthed 4 ft north of the first cast iron pipe (G on Photo and Figures).

The vitreous clay pipes were presumably associated with the former LOOW sanitary sewer system or acid sewer system (Wehran 1978). The clay pipe was opened and the sludge contents within were sampled. In addition, the soil beneath the vitreous clay pipe was also sampled. The sample results for the sludge collected from within the pipe are discussed in Section 11.1, ~~regarding underground LOOW utilities.~~

5.1.4 Soil Sampling Program

Field activities at the former LOOW nitration houses during the Phase I RI included collection of surface soil, subsurface soil, sludge, and ground-water samples. The ground-water sampling program is discussed in Section 5.1.8. The sludge sampling was conducted in association with the excavation of underground lines and is discussed in Section 11.1.

A sampling grid with a 100-ft interval was established across the area (Figure 5.1-1). Grid points were given alpha-numeric designations, with A0 being the southwestern origin of the grid. Due to the presence of a CWM ground-water interceptor trench at the A line, the eastern portion of this line was shifted to the north. In addition, location E300 was shifted to the west and re-designated E250 to avoid another CWM interceptor trench. Grid locations C100 and D100 were shifted to the east by 10 ft to be off of the berm of O Ditch and into the forested area. Minor shifts were performed on other locations to avoid rubble and concrete.

In addition, three biased sampling locations were established within the grid. The first location, BP1, was located near the northeast corner of the bi-trinitration house, adjacent to a concrete structure which may have been associated with storage tanks. BP2 was located adjacent to the northwest corner of the liquid-filled tank pit. BP3 was located in the area devoid of ground vegetation, adjacent to and northwest of the tank cradles associated with the acid fume recovery building.

An additional soil sample, PIPE1, was collected from beneath the vitreous clay pipe that was exposed during the excavation.

Direct push methodology was used to conduct sampling at each grid and biased point location. Surface soil samples, ranging in depth from 0 to 1 ft bgs, and subsurface soil samples, ranging in depth from 4 to 13.5 ft bgs, were collected from each location. Soil samples were used to describe site stratigraphy and were field screened for VOCs, PAHs, PCB, and TNT. Because grid locations A(+25)300, B300, C300, and D300 were located on the CWM SWMU side of the interceptor trench, samples from these locations were screened for DOD marker compounds (TNT) only.

Soil screening results were evaluated, and locations with the highest concentrations of constituents of potential concern (COPC) were re-sampled, re-screened, and submitted for confirmatory laboratory analysis of full suite parameters, as discussed in Sections 5.1.6 and 5.1.7.

5.1.5 Site Stratigraphy

Copies of the boring logs from the Phase I RI are included in Appendix A.

Surface Soil

Surface soil samples ranged in composition from an Upper Clay Till (UCT) gravel mix (possibly fill) in row G, to a thin layer of clayey silt (0.5 to 1 ft) overlying UCT at most locations. Surface soil was generally dry to moist.

Subsurface Stratigraphy

Subsurface stratigraphy in the vicinity of the nitration houses is best described by subdividing the grid into three regions: the F and G rows to the north, the eastern perimeter, and the central and southwestern portions of the grid.

The F and G rows are topographically lower than the remainder of the grid. In general, UCT was encountered from near the surface to 8 to 10 ft bgs, where contact between the UCT and GLC was reported (Figure 5.1-4). Typical UCT stratigraphy was reported in this area, consisting of dry, stiff clay with silt laminations and discontinuous, narrow sand lenses (less than 1 in.). Exceptions included a water-bearing fine sand layer, consisting of a 1- to 2-ft lens, encountered at G300 between 7 and 8 ft bgs. A moist silt lens was also reported at G0, at 4 to 4.5 ft bgs, which is approximately the level of the surface water in the Central Drainage Ditch, located adjacent to the soil boring.

Along the eastern perimeter of the grid [A(+25)300 through D300], dry to moist UCT was encountered from 10 to 14 ft bgs, with typical dry UCT presumed from 2 to 10 ft bgs. Interbedded moist silt lenses were observed within the UCT, but no substantial water-bearing unit was observed along the north-south trending 300 ft row. The Glaciolacustrine Clay (GLC) was not encountered before the borings were terminated at 14 ft bgs.

In the central, western, and southwestern areas of the grid, two water-bearing sand/silt/gravel (SM/ML) units were observed. The sand/silt layers were encountered as distinct units in location BP2, and were separated by an interbedded clay layer. The units were classified as having different color characteristics (pale yellowish brown at 8 to 9 ft bgs and moderate yellowish brown at 10 to 12 ft bgs). However, the units may both be classified as Upper Silt Till (UST) and may be hydraulically connected, as the alternating sand, silt, and UCT units appear discontinuous.

The upper sand/silt was also encountered in borings to the southwest [C110, C(+10)200, BP3, B100, A(-5)0], directly overlying a clay layer (UCT or GLC). The thickness of the upper layer was greater than 2 ft at C(+10)200, but it rose and apparently pinched out to the southwest as the moist clay layer rose. The bottom contact between the silt and UCT rose to 8.3 ft bgs at A(-5)0.

The lower sand/silt was encountered in borings northwest of BP2 (D0, D110, and E100), as a silty sand and/or gravel lens. The lower lens was generally moist to wet, and not as saturated as the upper lens. The thickness of the lower lens appeared to be maintained at 2 ft or greater, varying in depth between 10 to 14 ft bgs.

5.1.6 Soil Screening Results

VOCs were reported in 6 of the 66 original soil samples collected from the 33 direct push locations within the nitration house grid. The highest concentrations of VOCs, ranging up to

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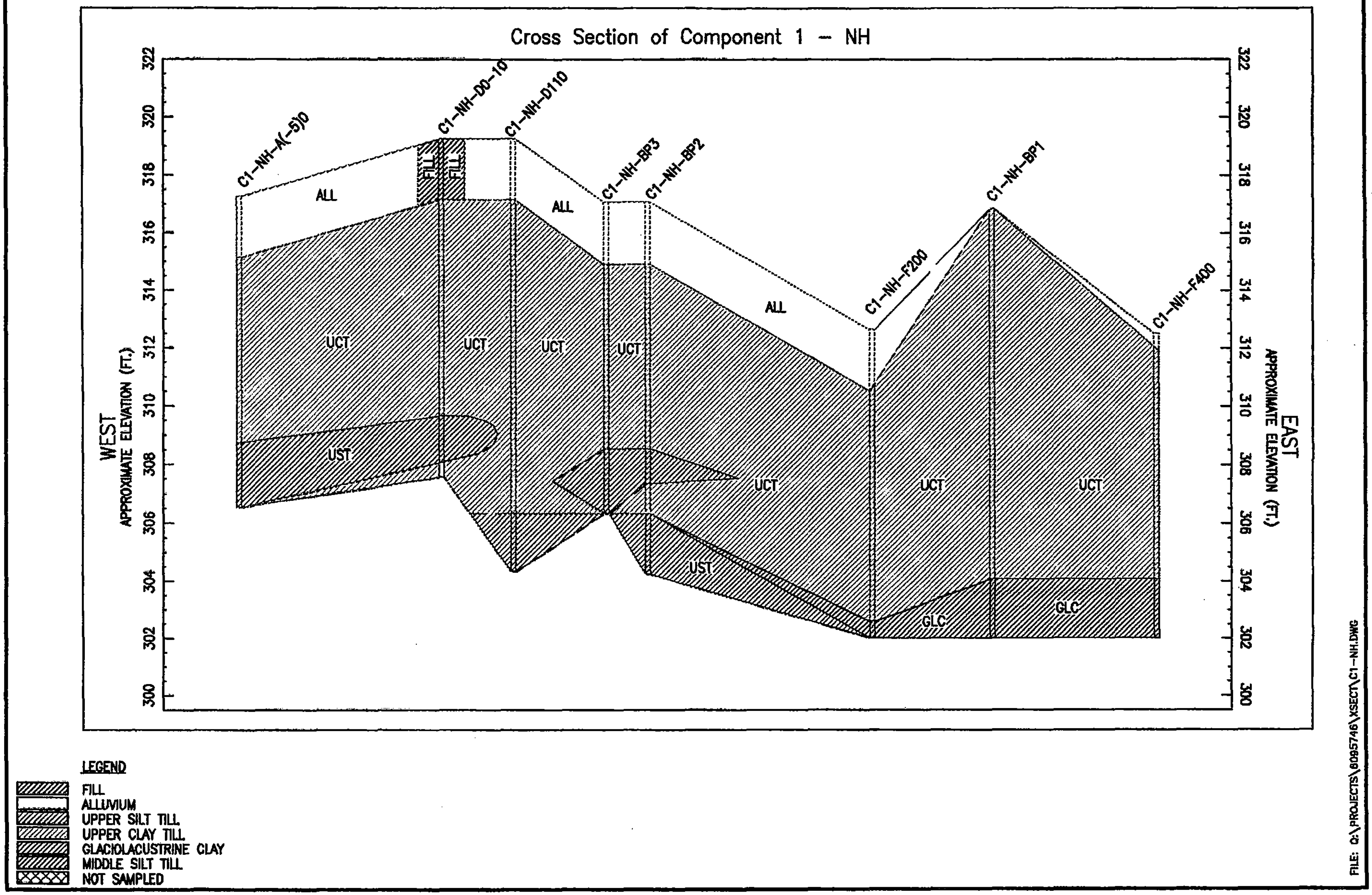

Cross Section of Component 1 - NH
WEST
APPROXIMATE ELEVATION (FT.)
EAST
APPROXIMATE ELEVATION (FT.)
C1-NH-A(-5)0
C1-NH-D0-10
C1-NH-D110
C1-NH-BP3
C1-NH-BP2
C1-NH-F200
C1-NH-BP1
C1-NH-F400
FILL
FILL
ALL
ALL
ALL
UCT
UCT
UCT
UCT
UCT
UCT
UCT
UST
UST
GLC
GLC
322
320
318
316
314
312
310
308
306
304
302
300
LEGEND
FILL
ALLUVIUM
UPPER SILT TILL
UPPER CLAY TILL
GLACIOLACUSTRINE CLAY
MIDDLE SILT TILL
NOT SAMPLED
FILE: Q:\PROJECTS\6095746\XSEC1\C1-NH.DWG

FIGURE 5.1-4

41.76 µg/kg of trans 1,2-DCE, were reported in location D0 at 10 ft. This concentration exceeded 1/10th of the NY State comparison criteria (Table 5.1-1).

PAHs were reported in all soil samples submitted for screening. However, the reported total PAH concentration did not exceed the NYSDEC TAGM recommended soil clean-up objective of 10,000 µg/kg for total carcinogenic SVOCs. Reported concentrations exceeded 1/10th of the comparison criteria in the following locations:

A(+35)200 (13.5 ft bgs)	B100 (surface)	BP1 (surface and 12.1 ft bgs)
C(+10)200 (surface)	C(-5)0 (surface)	E100 (surface)
E250 (9.5 ft bgs)	F100 (surface)	F200 (surface)
F300 (6.7 ft bgs)	F400 (surface)	G100 (surface)
G200 (1.3 ft bgs)	G300 (surface)	G400 (surface)

TNT was reported in location G200 at 0.3 ft with a concentration of 7,500 µg/kg. This concentration exceeds 1/10th of the NY State comparison criteria.

In addition, VOCs and PAHs were reported in the grab sample collected from beneath the vitreous clay pipe. The concentration of PAHs exceeded 1/10th of the NY State comparison criteria.

5.1.7 Laboratory Analyses and Confirmatory Soil Sample Results

Due to the reported presence of VOCs in samples D0 at 10 ft bgs and BP3 at 8.9 ft bgs, and TNT in the sample collected from G200 at 0.3 ft bgs, these locations were re-sampled, re-screened, and submitted for confirmatory laboratory analysis. Sample depths for those samples selected for laboratory analysis may have varied slightly from the depth of the original sample. In addition, the soil sample collected from beneath the clay pipe was also submitted for laboratory analysis, but was not re-submitted for field screening.

Re-screening Results

Although the sample from D0 at 10 ft was collected from the same interval as the original screening sample, trans 1,2-DCE was not reported in this second sample. PCE and TCE were reported, but in lower concentrations than the original sample. In addition, m&p xylene, not reported in the original sample, was reported in the second sample at a concentration of

89.98 μg/kg. The reported concentrations did not exceed 1/10th of the NY State comparison criteria.

The sample from BP3 for laboratory analysis was collected from a depth of 8 ft bgs. The three constituents reported in the original sample were not reported in the screening results of the resample. However, 1,1-DCE was reported in the resample.

The soil sample for laboratory confirmation from location G200 was collected from a depth of 1 ft bgs. TNT was not reported in the screening results of the resample.

Laboratory Results

Confirmatory soil samples were submitted for laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives (Table 5.1-2). The discussion in this section focuses on analytes that were reported in the samples at concentrations exceeding 1/10th of the NY State comparison criteria discussed in Chapter 4. These concentrations are highlighted in Table 5.1-2.

The concentrations of the majority of VOCs reported in the screening results were below the reporting limits for the laboratory results and therefore, were not expected to be reported in the laboratory data. The only reported VOC exceeding the soil screening criteria was an estimated concentration of acetone, a common laboratory contaminant, in the surface sample collected from G200.

SVOCs were reported in concentrations below 1/10th of the comparison criteria in samples collected from BP3, D0, and G200. PAHs exceeded 1/10th of the comparison criteria in the soil samples collected from G200 and exceeded the full value of the criteria in the sample collected from beneath the pipe (PIPE1).

The reported concentration of the pesticide methoxychlor exceeded 1/10th of the NY State comparison criteria in location G200 and in the sample collected from beneath the pipe (PIPE1). In addition, aldrin and dieldrin exceeded 1/10th of the comparison criteria in PIPE1. The PCB Aroclor 1260 was reported in G200. The reported concentration did not exceed 1/10th of the NY State comparison criteria.

Several metals exceeded 1/10th of the NY State comparison criteria. Iron exceeded the full value of criteria in each of the samples submitted. Antimony also exceeded the full value of the criteria in the sample collected from G200.

Generally, potential COPC were reported in highest concentrations in the surface soil sample collected from G200 and in PIPE1. G200 is located in a grassy area south of a CWM storm water collection pond, north of the former LOOW wash house.

The PAHs and PCB reported in the G200 and PIPE1 sample may not be indicative of expected COPC from former DOD-LOOW activities at this location.

5.1.8 Ground-Water Sampling Program and Results

Due to the presence and concentration of potential constituents of concern reported in the screening of the soil sample, the central location within the nitration house grid, and the stratigraphy indicating the presence of a water-bearing zone, a 1-in. temporary ground-water sampling point was installed in location BP3. The screening interval was between 5 to 10 ft bgs and included a lens of saturated fine sand. A ground-water sample was collected and submitted for laboratory analysis of full suite TCL/TAL analytes, boron, lithium, and explosives.

VOCs, pesticides, and metals were reported in concentrations exceeding the ground-water NY State comparison criteria (Table 5.1-3). The VOCs 1,1-DCA, 1,2-DCE, and TCE exceeded the criteria. Five additional VOCs exceeded $1/10^{th}$ of the NY State comparison criteria. However, these constituents may be from the former CWM West Drum Area to the south or from CWM Lagoons 6 and 7 to the east. The reported pesticides exceeded the criteria of 0 µg/L. Concentrations of boron, copper, iron, and manganese, as well as the essential nutrients magnesium and sodium, exceeded the screening criteria. Six additional metals exceeded $1/10^{th}$ of the NY State comparison criteria. The reported concentrations of the laboratory quality control duplicate exceeded control limits for aluminum and iron. The reported concentration of boron may indicate an impact from former DOD (AFP-68) use. SVOCs, PAHs, PCB, cyanide, and explosives were not reported in the ground-water sample collected from the nitration houses.

5.1.9 Conclusions and Recommendations

The nitration houses lie downgradient of the former CWM West Drum Storage Area, an area where the subsurface has been impacted primarily by VOCs, including non-aqueous phase liquid (NAPL). A Petrex soil vapor survey (Johnson 1998) and VOC analysis conducted on soil headspace from borings within the interior of the nitration house grid also reported VOCs within the area of the nitration houses. However, the potential source of reported VOC within the area of the nitration houses was not established. In addition, the potential source of VOCs in the vicinity of D0 has not been established. The VOCs reported in the ground water at location BP3 and in the soil at location D0 are recommended for further investigation.

Total PAH concentrations exceeding 1/10th of the NY State comparison criteria were reported in the surface soil at several locations within the existing nitration house area. These elevated PAHs are likely from deteriorating road surfaces and grading activities within the nitration house area and are not recommended for further investigation. However, total PAH concentrations exceeding 1/10th of the NY State comparison criteria were reported in the subsurface soil in the vicinity of A(+35)200, BP1, E250, and F300. With the exception of the elevated concentrations reported in location F300, the elevated PAHs are recommended for further investigation. Location F300 is in the vicinity of a former CWM soil storage pile with reported concentrations of PAHs and is therefore not recommended for further investigation under this HTRW project (URS 1986).

With the exception of the elevated boron reported in the ground-water sample collected from BP3, the metals concentrations reported in the soil and ground-water samples collected from within the area of the nitration houses appear to be indicative of site-specific background concentrations. However, a background metals concentration evaluation is recommended to more completely evaluate the reported metals concentrations. The elevated boron concentration reported in the ground-water sample from this area may indicate a possible impact from DOD activities associated with AFP-68 or the Navy IPPP and is recommended for further investigation.

The remaining underground lines may be providing a pathway for migration. There is evidence that these pipelines have acted as preferential pathways in the past (SCA 1979). However, because these pipelines may have been impacted by COPC associated with non-DOD use of the area, these lines and the associated potential impact from the lines, are not eligible for further investigation under this HTRW project.

The former LOOW buildings are still in existence, are in disrepair, and contain asbestos containing materials. However, the buildings are not eligible for demolition or removal under this HTRW project.

Table 5.1-1 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-A(+25)300-0.0-0.5	C1-NH-SO-A(+25)300-12.4-12.9	C1-NH-SO-A(+35)100-0.4-0.9	C1-NH-SO-A(+35)100-10.0-10.5	C1-NH-SO-A(+35)200-0.0-0.5	C1-NH-SO-A(+35)200-13.5-14.0	C1-NH-SO-A(-5)0-0.0-0.5	C1-NH-SO-A(-5)0-0.0-0.5 DUP	C1-NH-SO-A(-5)0-8.0-8.5	C1-NH-SO-B(+10)190-0.0-0.5
E4035	PAH	UG/KG	10000	NYTAGM	NA	NA	286	904	353	1109	336	511	812	471
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE										
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM	NA	NA						NA		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA	NA						NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA	NA						NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA	NA						NA		
GC	TOLUENE	UG/KG	1500	NYTAGM	NA	NA						NA		
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA	NA						NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA	NA						NA	0.62	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.1-1 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-A(+25)300-0.0-0.5	C1-NH-SO-B(+10)190-11.5-12.0	C1-NH-SO-B(-5)0-0.0-0.5	C1-NH-SO-B(-5)0-0.0-0.5 DUP	C1-NH-SO-B(-5)0-10.0-10.5	C1-NH-SO-B100-0.5-1.0	C1-NH-SO-B100-0.5-1.0-DUP	C1-NH-SO-B100-8.1-8.6	C1-NH-SO-B300-0.5-1.0	C1-NH-SO-B300-13.5-14.0	C1-NH-SO-BP1-0.1-0.6	C1-NH-SO-BP1-12.1-12.6
E4035	PAH	UG/KG	10000	NYTAGM	NA	912	722	NA	168	3266	3043	404	NA	NA	2124	1170
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE				NA								
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM	NA						NA		NA	NA		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA						NA		NA	NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA						NA		NA	NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA						NA		NA	NA		
GC	TOLUENE	UG/KG	1500	NYTAGM	NA						NA		NA	NA		
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA						NA		NA	NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA						NA		NA	NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.1-1 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-A(+25)300-0.0-0.5	C1-NH-SO-BP2-0.5-1.0	C1-NH-SO-BP2-0.5-1.0-DUP	C1-NH-SO-BP2-11.0-11.5	C1-NH-SO-BP2-8.2-8.7	C1-NH-SO-BP3-0.5-1.0	C1-NH-SO-BP3-8-REP	C1-NH-SO-BP3-8.0-DUP	C1-NH-SO-BP3-8.9-9.4	C1-NH-SO-C(+10)200-0.0-0.5	C1-NH-SO-C(+10)200-8.5-9.0
E4035	PAH	UG/KG	10000	NYTAGM	NA	431	490	298	843	482	405	330	377	1712	225
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE											
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM	NA		NA					NA	1.01		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA		NA				0.07	NA			
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA		NA					NA			
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA		NA					NA	1.37		1.2
GC	TOLUENE	UG/KG	1500	NYTAGM	NA		NA					NA			
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA		NA					NA			
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA		NA					NA	3.24		4.31

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

Table 5.1-1 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-A(+25)300-0.0-0.5	C1-NH-SO-C(-5)0-0.0-0.5	C1-NH-SO-C(-5)0-9.5-10.0	C1-NH-SO-C110-0.0-0.5	C1-NH-SO-C110-8.0-8.5	C1-NH-SO-C300-0.1-0.6	C1-NH-SO-C300-0.1-0.6-DUP	C1-NH-SO-C300-12.0-12.5	C1-NH-SO-D0-0.0-0.5	C1-NH-SO-D0-10-REP	C1-NH-SO-D0-10.0-10.5
E4035	PAH	UG/KG	10000	NYTAGM	NA	1271	168	660	388	NA	NA	NA	702	278	237
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE											
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM	NA					NA	NA	NA			
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA					NA	NA	NA			
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA					NA	NA	NA		89.95	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA					NA	NA	NA		3.71	10.81
GC	TOLUENE	UG/KG	1500	NYTAGM	NA					NA	NA	NA			
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA					NA	NA	NA			41.76
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA					NA	NA	NA		5.75	19.34

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.1-1 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-A(+25)300-0.0-0.5	C1-NH-SO-D110-0.0-0.5	C1-NH-SO-D110-12.0-12.5	C1-NH-SO-D200-0.0-0.5	C1-NH-SO-D200-11.3-11.8	C1-NH-SO-D300-0.0-0.5	C1-NH-SO-D300-12.8-13.3	C1-NH-SO-E0-0.0-0.5	C1-NH-SO-E0-9.5-10.0	C1-NH-SO-E100-0.5-1.0
E4035	PAH	UG/KG	10000	NYTAGM	NA	663	623	329	225	NA	NA	458	443	1032
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE										
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM	NA					NA	NA			
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA					NA	NA			
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA					NA	NA			
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA					NA	NA			
GC	TOLUENE	UG/KG	1500	NYTAGM	NA					NA	NA			
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA					NA	NA			
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA					NA	NA		2.49	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.1-1 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-A(+25)300-0.0-0.5	C1-NH-SO-E100-10.1-10.6	C1-NH-SO-E100-2.5-3.0	C1-NH-SO-E200-0.0-0.5	C1-NH-SO-E200-9.0-9.5	C1-NH-SO-E250-0.3-0.8	C1-NH-SO-E250-9.5-10.0	C1-NH-SO-F0-0.0-0.5	C1-NH-SO-F0-0.0-0.5-DUP	C1-NH-SO-F0-7.5-8.0
E4035	PAH	UG/KG	10000	NYTAGM	NA	245	321	582	632	290	1006	872	929	544
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE										
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM	NA								NA	
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA								NA	
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA								NA	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA								NA	
GC	TOLUENE	UG/KG	1500	NYTAGM	NA								NA	
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA								NA	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA								NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.1-1 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-A(+25)300-0.0-0.5	C1-NH-SO-F100-0.2-0.7	C1-NH-SO-F100-11.0-11.4	C1-NH-SO-F100-11.0-11.4-DUP	C1-NH-SO-F200-0.0-0.5	C1-NH-SO-F200-6.0-6.5	C1-NH-SO-F300-0.0-0.5	C1-NH-SO-F300-2.0-3.0-COMP	C1-NH-SO-F300-2.0-3.0-DUP	C1-NH-SO-F300-6.7-7.2
E4035	PAH	UG/KG	10000	NYTAGM	NA	1430	91	99	5232	562	2221	484	684	1005
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE										
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM	NA			NA					NA	
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA			NA					NA	
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA			NA					NA	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA			NA					NA	
GC	TOLUENE	UG/KG	1500	NYTAGM	NA			NA					NA	
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA			NA					NA	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA			NA					NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.1-1 *Component 1, Former* LOOW Nitration Houses, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-A(+25)300-0.0 0.5	C1-NH-SO-F400-0.2-0.7	C1-NH-SO-F400-8.8-9.3	C1-NH-SO-G0-0.5-1.0	C1-NH-SO-G0-4.0-4.5	C1-NH-SO-G100-0.5-1.0	C1-NH-SO-G100-8.0-8.5	C1-NH-SO-G200-0.3-0.8	C1-NH-SO-G200-1-REP	C1-NH-SO-G200-1.3-1.8
E4035	PAH	UG/KG	10000	NYTAGM	NA	2614	375	267	430	2333	541	904	2249	7001
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE								7500		
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM	NA									
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA									
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA									
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA									
GC	TOLUENE	UG/KG	1500	NYTAGM	NA									
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA									
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA									

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.1-1 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-A(+25)300-0.0 0.5	C1-NH-SO-G200-8.2-8.7	C1-NH-SO-G300-0.4-0.9	C1-NH-SO-G300-8.2-8.7	C1-NH-SO-G300-8.2-8.7-DUP	C1-NH-SO-G400-0.2-0.7	C1-NH-SO-G400-6.4-6.9	C1-NH-SO-PIPE1-REP
E4035	PAH	UG/KG	10000	NYTAGM	NA	487	3433	269	NA	1442	538	4633
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE					NA			
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM	NA							
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA							
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA							
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA							0.38
GC	TOLUENE	UG/KG	1500	NYTAGM	NA							0.12
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA							
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA							0.14

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 5.1-2 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-BP3-8-REP	C1-NH-SO-D0-10-REP	C1-NH-SO-G200-1-REP	C1-NH-SO-PIPE1-REP
E160.3	PERCENT MOISTURE	%			13.4	12.9	8.9	12.3
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	3520	5650	9990	6430
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.14 BN	0.33 BN	0.65 BN	0.46 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	1.5	2.6	3	2.9
SW6010	BARIUM	MG/KG	300	NYTAGM	52.2	83.1	97.8	49.6
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.08 B	0.18 B	0.44 B	0.19 B
SW6010	BORON	MG/KG			3.5 B	4.8 B	6.8 B	3.9 B
SW6010	CADMIUM	MG/KG	10	NYTAGM			1.7	
SW6010	CALCIUM	MG/KG			32200 *	46300 *	36600 *	35600
SW6010	CHROMIUM	MG/KG	50	NYTAGM	5	9.3	33.8	12.5
SW6010	COBALT	MG/KG	30	NYTAGM	3.4 B	5.7	7.9	5.1 B
SW6010	COPPER	MG/KG	50	NYTAGM-BG	17.5	30.7	28.8	27.5
SW6010	IRON	MG/KG	2000	NYTAGM	10500	15600	21800	19000
SW6010	LEAD	MG/KG	400	NYTAGM	3.2	7	11.8	6 *
SW6010	LITHIUM	MG/KG			6.3	13.5	19.3	11.6
SW6010	MAGNESIUM	MG/KG			4030	7170	7610	3350 N
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	624	740	637	501
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	6.5	12.4	17	10.4
SW6010	POTASSIUM	MG/KG			648	941	1290	634
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG				1.2
SW6010	SODIUM	MG/KG			323	198	215	179
SW6010	VANADIUM	MG/KG	150	NYTAGM	9.3	12.8	20.3	13 E
SW6010	ZINC	MG/KG	76	NYTAGM-BG	19.6	36.2	54.4	73.3 N
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG		0.11 B	0.13 B	
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM			3.1	10 P
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM			2.5 P	
SW8081	ALDRIN	UG/KG	41	NYTAGM			2.5 P	16 P

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

Table 5.1-2 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-BP3-8-REP	C1-NH-SO-D0-10-REP	C1-NH-SO-G200-1-REP	C1-NH-SO-PIPE1-REP
SW8081	ALPHA-BHC	UG/KG	110	NYTAGM		0.16		
SW8081	ALPHA-CHLORDANE	UG/KG	540	NYTAGM				4.1 P
SW8081	BETA-BHC	UG/KG	200	NYTAGM			0.43 P	
SW8081	DELTA-BHC	UG/KG	300	NYTAGM				7.2 P
SW8081	DIELDRIN	UG/KG	44	NYTAGM				9.7
SW8081	ENDOSULFAN I	UG/KG	900	NYTAGM			0.27 P	3.7 P
SW8081	ENDRIN ALDEHYDE	UG/KG					2.3 P	
SW8081	ENDRIN KETONE	UG/KG						3.3 P
SW8081	GAMMA-BHC	UG/KG	60	NYTAGM		0.22 P		
SW8081	GAMMA-CHLORDANE	UG/KG	540	NYTAGM				0.63 P
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM			2.4 P	10:00 PM
SW8081	METHOXYCHLOR	UG/KG						2.7 P
SW8082	AROCLOR 1260	UG/KG	1000	NYTAGM			70	
SW8260B	ACETONE	UG/KG	200	NYTAGM			390 J	
SW8270C	BIS(2-ETHYLHEXYL) PHTHAL	UG/KG	50000	NYTAGM	650	4000	820	
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM			48	1100
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM			4	76
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM	0.72		13	230
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM			17	250
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	3.9		21	280
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM			20	140
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	1.1		9	110
SW8310	CHRYSENE	UG/KG	400	NYTAGM	1.2		15	200
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM			3.1	21
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	1.6	1.1	31	580 D
SW8310	FLUORENE	UG/KG	50000	NYTAGM				17
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM			7.2	74

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

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Table 5.1-2 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-SO-BP3-8-REP	C1-NH-SO-D0-10-REP	C1-NH-SO-G200-1-REP	C1-NH-SO-PIPE1-REP
SW8310	NAPHTHALENE	UG/KG	13000	NYTAGM				13
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM		0.78	16	300 D
SW8310	PYRENE	UG/KG	50000	NYTAGM	1.2	0.74	24	450 D

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 5.1-3 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-GW-BP3
SW6010	ALUMINUM	D	UG/L			323 *
SW6010	ALUMINUM	T	UG/L			3810 *
SW6010	ANTIMONY	D	UG/L	3	NYGUIDANCE	1.5 B
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	2.1 B
SW6010	ARSENIC	D	UG/L	25	NYSTANDARD	5.7 B
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD	8.8 B
SW6010	BARIUM	D	UG/L	1000	NYSTANDARD	58.3 B
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	85.8 B
SW6010	BORON	D	UG/L	1000	NYSTANDARD	1070
SW6010	BORON	T	UG/L	1000	NYSTANDARD	1010
SW6010	CALCIUM	D	UG/L			370000
SW6010	CALCIUM	T	UG/L			388000
SW6010	CHROMIUM	T	UG/L	50	NYSTANDARD	5.8 B*
SW6010	COPPER	D	UG/L	200	NYSTANDARD	271 E
SW6010	COPPER	T	UG/L	200	NYSTANDARD	267 E
SW6010	IRON	D	UG/L	300	NYSTANDARD	108 *
SW6010	IRON	T	UG/L	300	NYSTANDARD	7570 *
SW6010	LEAD	D	UG/L	25	NYSTANDARD	1.2 B
SW6010	LEAD	T	UG/L	25	NYSTANDARD	3
SW6010	LITHIUM	D	UG/L			20.1
SW6010	LITHIUM	T	UG/L			25.8
SW6010	MAGNESIUM	D	UG/L	35000	NYSTANDARD	127000
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	130000
SW6010	MANGANESE	D	UG/L	300	NYSTANDARD	555
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	949
SW6010	NICKEL	D	UG/L			830
SW6010	NICKEL	T	UG/L			841

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.1-3 Component 1, Former LOOW Nitration Houses, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-NH-GW-BP3
SW6010	POTASSIUM	D	UG/L			5600 EN
SW6010	POTASSIUM	T	UG/L			6270 EN
SW6010	SELENIUM	D	UG/L	10	NYSTANDARD	7.3
SW6010	SELENIUM	T	UG/L	10	NYSTANDARD	7.6
SW6010	SODIUM	D	UG/L	20000	NYSTANDARD	458000
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	451000
SW6010	ZINC	D	UG/L	300	NYSTANDARD	14.3 B
SW6010	ZINC	T	UG/L	300	NYSTANDARD	30.8
SW7470	MERCURY	T	UG/L	2	NYSTANDARD	0.15 B
SW8081	4,4'-DDD	N	UG/L	0	NYSTANDARD	0.01
SW8081	GAMMA-BHC	N	UG/L	0	NYSTANDARD	0.02
SW8260B	1,1,1-TRICHLOROETHAN	N	UG/L	5	NYSTANDARD	4
SW8260B	1,1,2-TRICHLOROETHAN	N	UG/L	5	NYSTANDARD	0.6
SW8260B	1,1-DICHLOROETHANE	N	UG/L	5	NYSTANDARD	6
SW8260B	1,2-DICHLOROETHANE	N	UG/L	5	NYSTANDARD	3
SW8260B	1,2-DICHLOROETHENE, T	N	UG/L	5	NYSTANDARD	8
SW8260B	CHLOROFORM	N	UG/L	7	NYSTANDARD	2
SW8260B	TETRACHLOROETHENE	N	UG/L	5	NYSTANDARD	2
SW8260B	TRICHLOROETHYLENE	N	UG/L	5	NYSTANDARD	36 D

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

5.2 AREAS C AND NORTH OF C

5.2.1 Site Background

Area C (and north of Area C) was one of five areas identified by Olin in 1981 suspected of containing waste disposed during the decommissioning of the Navy IPPP and AFP-68. Olin personnel indicated that approximately 200 to 300 drums were placed in an east-west trench, located west of SLF-7. Investigations conducted by Ecology and Environment and Acres identified a geophysical anomaly in area C, southwest of SLF 7. However, the anomaly was never fully characterized. In addition, the northern and western portion of Area C was not fully characterized during the previous geophysical survey due to the presence of a CWM clean soil pile.

In addition to the Olin reports, review of historical aerial photographs revealed an area of ground scarring in Areas C and north of C in the 1960 and 1963 timeframe, during use by the DOD (EA 1998c). This ground scarring may have been the result of disposal activities. It is known that the ground water in the western portion of Area C, in the vicinity of CWM piezometer P1202S, has been impacted by COPC.. The source of the COPC within P1202S has not been located.

5.2.2 Field Reconnaissance and Surface Features

During the Phase I RI investigation a site reconnaissance was performed prior to establishing a geophysical survey and soil sampling grid in Areas C and north of C. The area north of Area C is located between SLF7 and SLF12 and is extensively used by CWM for container storage and storage of clean soil. It is bordered by asphalt/gravel roads on the north, east, and west side, and by a dirt/gravel road on the southern side. The eastern road and the western road correspond to the position of former LOOW First Avenue and Second Avenue, respectively. Adjacent to and east of Second Avenue is a gravel/asphalt parking area used by CWM to store trailers and roll-off containers. Between this parking area and Second Avenue is a small southerly flowing surface water drainage swale. The central and eastern areas are not paved, and are used to store roll-off containers and associate HDPE liners. The southern dirt/gravel road trends east-west between SLF12 and the CWM waste stabilization area, and separates Area C from north of C. Westerly flowing B Ditch is south of and parallels this dirt/gravel road (see Chapter 13). CWM's oil water separator and leachate collection facility is located south of this dirt road, in Area C. During this Phase I RI investigation there were two clean soil piles present, one in Area C the other in the area north of Area C.

CWM is currently operating a ground-water interim remedial action for PW1202S, located on Second Avenue, on the western border of the area north of Area C.

The surface soil in the area has been extensively graded by CWM and consists primarily of fill and clay, presumably UCT.

5.2.3 Geophysical Survey Program and Results

Area North of C

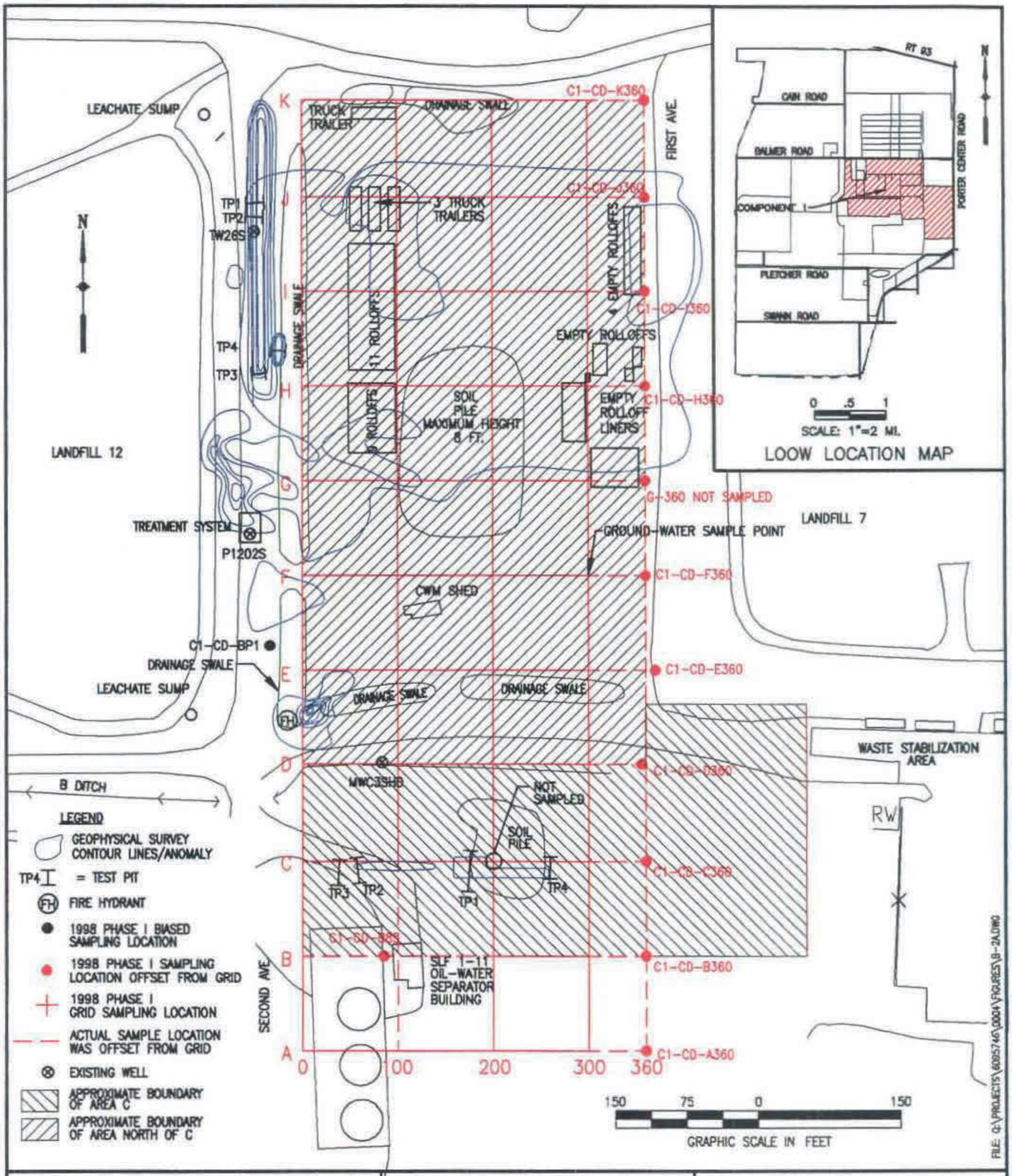
During this Phase I RI investigation, an EM geophysical survey was performed to close data gaps left in the previous survey due to the presence of a large CWM clean soil pile in the northern portion of the area north of Area C. In addition, an area of historical ground scarring in the western portion of the area north of Area C (on and adjacent to Second Avenue) was not fully characterized in past investigations.

A survey grid with 100-ft intervals was established from Second Avenue east to First Avenue, and south to B Ditch (Figure 5.2-1). Several areas of high EM results were observed in the vicinity of the storage containers and roll-off containers. This was presumably interference from the metallic containers. An anomaly was also reported on the southern portion of the grid, in the vicinity of a fire hydrant and metal surface water pipe beneath the driveway just east of the fire hydrant. A significant EM anomaly, not attributable to surface artifacts, was recorded on Second Avenue, generally between CWM P1202S and temporary well TW26S, and extending north of TW26S approximately 50 ft. A second smaller, circular anomaly was identified on the eastern edge of Second Avenue between grid rows H and I. The anomaly located north of P1202S is likely due to a series of temporary wells, electrical lines, and conduit located just northwest of the P1202S treatment building.

The locations of the long linear anomaly and the small circular anomaly between the H and I rows were verified by a magnetometer sweep and marked for excavation.

Area C

The geophysical anomaly discovered by Ecology and Environment was relocated using available historical maps (Acres 1989) and by performing a qualitative magnetometer sweep over the area. The magnetometer sweep indicated an anomaly approximately 30 ft south of the anomaly



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 1 (CWM) AREAS C AND NORTH OF C SAMPLING GRID LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	DLR	JBS	BCR	AS SHOWN	JULY 1999	60957.46	5.2-1

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indicated on the historical maps. This discrepancy may have been due to the lack of adequate map references remaining at the site.

The magnetometer sweep identified the anomaly as being approximately 10-ft wide by 210-ft long with a null of approximately 20 ft in the center of the anomaly, indicating two separate anomalies (Figure 5.2-2). The anomaly trended east-west and was located 70-ft north of the CWM leachate collection facility. The location of the anomaly was marked for excavation.

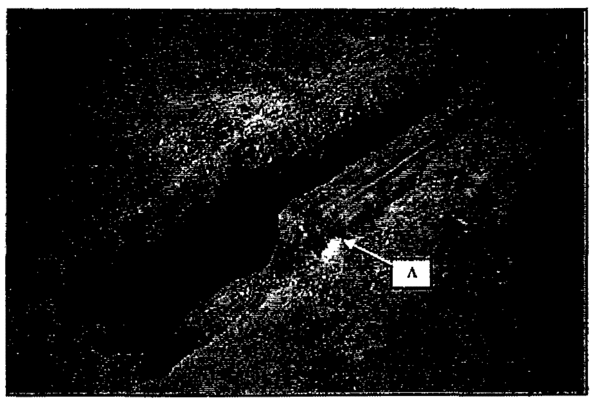
5.2.4 Trenching Activities, Sampling Program, and Results

5.2.4.1 Trenching Activities

Trenching was performed in Areas C and north of C during this Phase I RI to evaluate the identity of geophysical anomalies reported at the site. Test trenches, approximately 3 ft in width, were excavated perpendicularly to the surveyed anomaly.

Area North of C

Three test trenches were excavated perpendicular to the linear anomaly reported between P1202S TW26S and north of TW26S. The first trench was excavated approximately 30 ft north of TW26S. The trench trended east-west and was 16 ft long by 3 ft wide. What appeared to be a concrete foundation with steel rebar was encountered at 1-ft bgs (A on Photo 5.2-1). The foundation was 6 in. thick. The anomaly reported during the geophysics survey was presumably this foundation. The second test trench, with the same dimension of the first, was excavated 15 ft south of and parallel to the first trench. What appeared to be a continuation of the same concrete foundation was encountered at 1 ft bgs. The third test pit was excavated approximately 160 ft south of second test trench. What was presumably the same foundation was unearthed at 1 ft bgs. The excavation was not continued beneath this reinforced concrete foundation. Soil was not encountered during the test pitting in this area. There was no staining of the observed fill or concrete foundation. Photograph 5.2-1 shows the concrete foundation (label A).



Photograph 5.2-1 Reinforced concrete foundation excavated in Area North of C.

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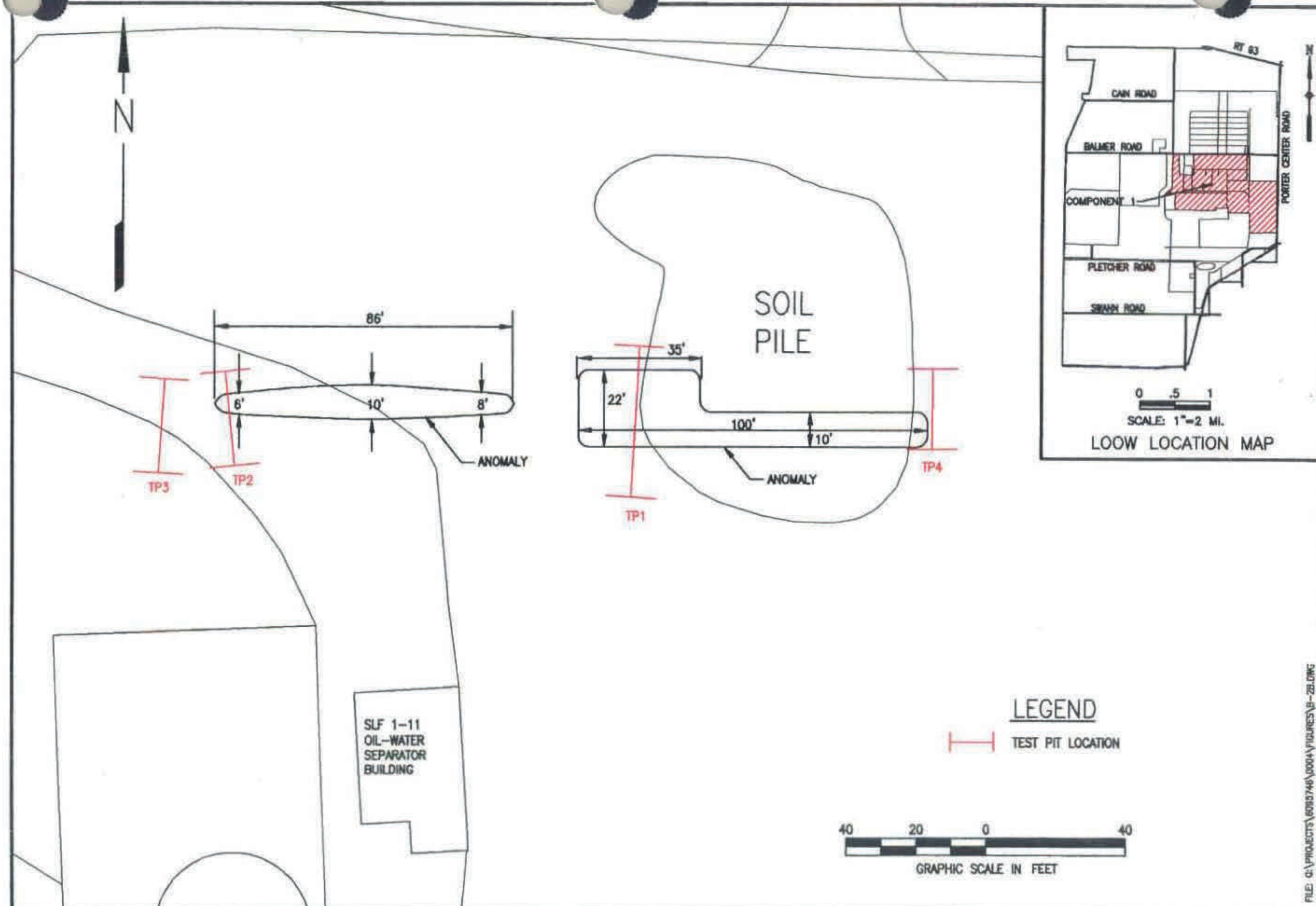

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 1 (CWM) AREA C TEST PITS	DESIGNED BY DLR	DRAWN BY JBS	DATE MAY 1999	PROJECT NO. 60957.46
			CHECKED BY BCR	PROJECT MGR. HGP	SCALE AS SHOWN	FIGURE 5.2-2

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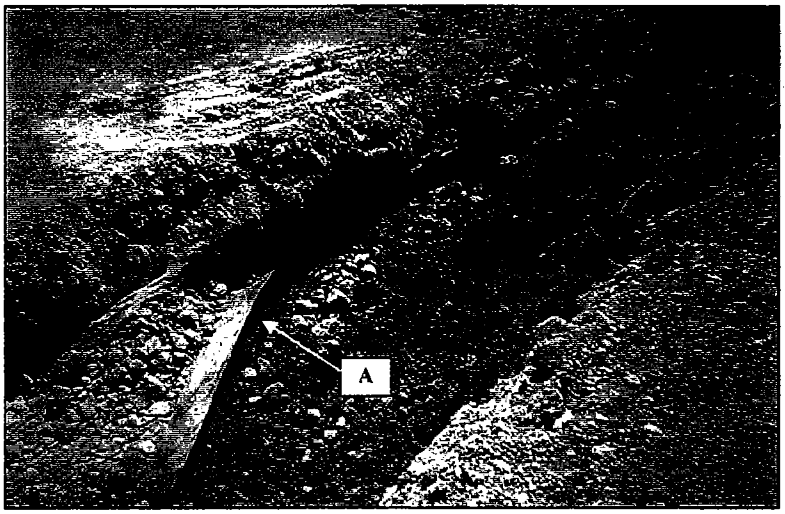
An additional anomaly was reported on the eastern edge of Second Avenue. A fourth test trench was excavated in the vicinity of the anomaly. The test trench trended east-west and was 15 ft long by 3 ft wide. At 2 ft bgs, a piece of steel I-beam was unearthed (A on Photo 5.2-2), upon further excavation, an additional piece of metal and rebar was unearthed. The pieces of metal were removed and a magnetometer sweep was performed in the area of the former anomaly. There was no response with the magnetometer, confirming that the anomaly had been removed. Photograph 5.2-2 shows the I-beam that was unearthed from test trench 4.



Photograph 5.2-2 I-beam unearthed in Area North of C, test trench 4.

Area C

Test trenches were performed perpendicularly to the anomaly reported in Area C. The first test trench was excavated approximately 70 ft north and 30 ft east of the CWM leachate collection facility. The excavation was performed across the eastern end of the western anomaly. During the excavation, metal 55-gallon drums and high-pressure gas cylinders were unearthed at 6 ft bgs. The integrity of the drums had been compromised and most were crushed (Photograph 5.2-3).

The majority of the high-pressure gas cylinders were in a similar condition. However, there were a few high-pressure gas cylinders that appeared to be intact (Photograph 5.2-4). The containers appeared to be stacked approximately 4 deep, from 6 to 9 ft bgs. The area of containers encountered within TP1 was approximately 20 ft wide, from north to south and

Photograph 5.2-3 Containers removed from Area C drum trench, looking northwest.

spanned the entire 4 ft width of the test trench. Three drums and two cylinders were extracted from TP1. Approximately 4 containers remained in the test pit. During removal of one of the crushed drums a liquid was observed within the crushed drum and within the test trench. Although this was believed to be trapped ground water, a sample of this liquid, C1-CD-GW-TP1, was collected and submitted for laboratory analysis of VOCs, SVOCs, PAHs, pesticides, PCB, PCP, TAL metals, boron, lithium, explosives, and cyanide. A sample of the soil from between and beneath the containers, C1-CD-SO-TP1-20-6, was submitted for laboratory analysis of the same list of analytes. Results of the analysis are discussed below. Photograph 5.2-3 shows the 5 containers that were removed. Photograph 5.2-4 is a close-up of the two high-pressure cylinders. The final dimensions of TP1 were 43 ft long by 4 ft wide by 11 ft deep.

Photograph 5.2-4 Close-up of high-pressure gas cylinders removed from drum trench

A second test trench was excavated within the western edge of the anomaly, approximately 70 ft north and 28 ft west of the CWM leachate collection facility. A petroleum-like and a fertilizer-like odor was encountered at 8 ft bgs. A greasy substance was encountered at the same interval. A sample of this substance, C1-CD-SO-TP2-17-8-1, was submitted for laboratory analysis of full suite TCL/TAL analytes, boron, lithium, and explosives. A soil sample from the vicinity of the grease staining, C1-CD-SO-TP2-18-8-2, was field screened for VOCs, PAHs, PCB, and TNT. Results of the analysis are discussed below. Crushed 55-gallon drums were encountered at 6-ft bgs. At this end of the apparent drum trench, the drums were stacked approximately 3 deep, from 6-ft to 8-ft bgs. The width of the drum area from north to south within TP2 was approximately 8 ft. Drums were not removed from TP2. In an attempt to verify that a second deeper drum trench below the first did not exist, a magnetometer sweep was performed in the trench beneath the drums that were removed. Unfortunately, the nearby drums still present in the drum trench interfered with the magnetometer sweep and rendered it inconclusive.

Two additional test trenches, TP3 and TP4, were excavated outside of the geophysical anomaly, on the west and east ends, respectively. The purpose of these test trenches was to verify, as reported by the magnetometer survey, the end of the drum trench. TP3 trended north to south a length of 27ft, extended a width of 3 ft, and to a depth of 10 ft. There were no drums or stained soil encountered within the test trench. A soil sample, C1-CD-SO-TP3-12-10 was collected 12 ft south of the northern end of TP3, from a depth of 10 ft. The sample was submitted for full suite laboratory analysis.

TP4 trended north to south a distance of 23 ft, extended a width of 3 ft, and to a depth of 10 ft. There were no drums or stained soil encountered within the test trench.

5.2.4.2 Test Trench Sampling Program and Results

Samples collected from the test pits within the drum trench were screened for VOC, PCB, PAHs, and TNT. A subset of these samples was submitted for laboratory analysis of full suite TCL/TAL analytes, boron, lithium, and explosives. In addition, a sample was collected from test trench 3, outside of the drum trench was submitted for full suite laboratory analysis. A soil sample was collected from test trench 4, but was inadvertently not shipped for analysis.

In addition, an aqueous sample was collected from within test trench 1 in Area C and analyzed for full suite TCL/TAL analytes, boron, lithium, and explosives.

A description of the sample designation for samples collected from within the test pits is as follows. Following the "-SO" for the matrix identifier, is the test trench number ("-TP2"), followed by the distance from the northern terminus of the test trench ("-17"), followed by the depth from within the test trench that the sample was taken ("-8"). Additional sequential numbers represent samples collected from within the same area.

Screening Results

The sample of the greasy substance collected from test trench 2, TP2-17-8-1, reported concentrations of total PAHs and cis 1,2-DCE in exceedance of the NY State comparison criteria. In addition, ethylbenzene, o-xylene, and toluene concentrations exceeded 1/10th of the criteria in the soil screening results. The soil sample collected from the vicinity of the greasy substance, TP2-17-8-2.0, reported concentrations of total PAHs and benzene in exceedance of the screening criteria. Toluene exceeded 1/10th of the comparison criteria in the soil sample collected from TP2-17-8-2.0. PCB and TNT were not reported in the samples screening results for the test trench samples. Analytes reported in concentrations exceeding the method detection limit are summarized in Table 5.2-1.

Test Trench Laboratory Analytical and Screening Confirmatory Results

Samples collected from within test trenches 1, 2, and 3 at Area C were submitted for full suite TCL/TAL, boron, lithium, and explosives analyses (Table 5.2-2).

Results from the sample collected from test trench 1 (TP1-20-6) and test trench 2 (TP2-17-8-1) reported concentrations of benzene in exceedance of the NY State comparison criteria. The concentration reported in TP1 was estimated. In addition, the reported total xylene concentration exceeded the screening criteria and the concentration of toluene exceeded 1/10th of the criteria in the sample collected from TP2. VOCs were not reported in the sample collected from TP3. SVOCs, primarily PAHs, were also reported in each of the samples from the test trenches. Benz[a]anthracene exceeded the NY State comparison criteria, and chrysene, naphthalene, phenanthrene, and dibenzofuran exceeded 1/10th of the criteria in the sample collected from TP2.

Trace concentrations of pesticides were reported in the samples from TP2 and TP3.

The reported concentration of antimony exceeded the NY State comparison criteria in the sample collected from TP1. Iron exceeded the criteria in each of the samples collected from within the test trenches. Other metals , including some essential nutrients, exceeded 1/10th of the NY State comparison criteria. Although adequate background concentrations for boron and lithium have not been developed for this site, the concentration of boron and lithium in the sample collected from TP1 were elevated in comparison with the boron and lithium concentrations reported for the majority of other soil samples collected during the Phase I investigation. This suggests a potential impact is associated with former DOD (AFP-68 or Navy IPPP) activities.

PCB, cyanide, and explosives were not reported in the samples collected from the Area C test trenches.

Results from the test trench samples indicate that the impact to soil is primarily confined to the area of the test trench, as defined by the magnetometer survey. Test trenching was performed by Acres in an area approximately 30 ft north of the drum trench. Samples collected from the trench did not report VOCs, SVOCs, pesticides, PCB, or metals. Trace concentrations of pesticides were reported in the samples collected by Acres (Acres 1990a).

Test Trench Aqueous Sample Results

Ground-water screening criteria were exceeded for VOCs, SVOCs, PAHs, pesticides, metals, including boron, and explosives (Table 5.2-3). Concentrations of VOCs ranged up to 9,600 µg/L of acetone, 8,000 µg/L of methylene chloride, and 840 µg/L of benzene, for example. SVOCs ranged up to 1,200 µg/L of phenol. PAHs ranged up to 4.4 µg/L naphthalene. Pesticides ranged up to 0.79µg/L heptachlor epoxide. Metals concentrations ranged up to 1,630,000 µg/L iron, 351,000 µg/L lithium, and 232,000 µg/L boron, for example. Explosives ranged up to 130 µg/L of nitrobenzene.

PCB and cyanide were not reported in the aqueous sample from test trench 1.

Ground-water samples analyzed by Acres from MWC3S (depth of 13 ft), located approximately 100 ft north of the drum trench, reported trace concentrations of methylene chloride and acetone (Acres 1990a). In addition, the deep well MWC3S, reported trace concentrations of lithium.

The results indicate that ground water has been impacted in the area of the drum trench, however, little impact was reported down gradient, based on historical data.

5.2.5 Direct Push Soil Sampling Program

Field activities at Areas C and north of C during the Phase I RI included collection of surface soil, subsurface soil, and ground-water samples from direct push boring locations. The ground-water sampling program is discussed in Section 5.2.9. The direct push soil sampling program is discussed below.

A sampling grid with an approximate 100-ft interval was established across the area (Figure 5.2-1). Grid points were given alphanumeric designations, with A0 being the southwestern origin of the grid. From the origin, the grid extended to the north 1,000 ft, to row K, and to the east 360 ft. Due to the presence of a CWM SLF7, the 400-ft row was shifted to the west, to approximately 360 ft east of the origin line. Grid location B100 was shifted to the west, to B85, due to the presence of CWM's leachate collection building. Refusal was encountered at 7 ft bgs at location G360, with no recovery and location C200 was on a CWM clean soil pile. Therefore, samples were not collected from these two locations. Minor shifts were performed on other locations to avoid roll-off containers.

In addition to the grid locations, one biased point, BP1, was installed adjacent to and west of the surface drainage that runs south through the area.

Direct push technology was used to perform sampling at each grid location. Due to the extensive use and grading of the area by CWM, only subsurface samples were collected at Areas C and north of C. Subsurface samples ranged in depth from 7.5 to 14 ft bgs. Soil samples were used to describe site stratigraphy and were field screened for VOCs, PAHs, PCB, and TNT.

Soil screening results were evaluated and locations exhibiting elevated concentrations of potential constituents of concern were re-sampled, re-screened, and submitted for confirmatory laboratory analysis for DOD constituents of concern as discussed in Sections 5.2.7 and 5.2.8.

5.2.6 Site Stratigraphy

Surface Soil

The ground surface is a mixture of sand and gravel roadbed material with isolated vegetation. Surface soil samples collected from the Areas C and north of C were generally classified as gravelly, clayey-silts but can be classified as fill due to the extensive grading that has occurred in the area. A gravel layer, up to a few inches thick, exists on the surface in most areas. Soil samples were generally dry.

Subsurface Stratigraphy

Subsurface soil samples were collected from 6 to 12 ft bgs. The samples generally consisted of moderate brown to pale brown, moist, silty clays to clayey silts (Figure 5.2-3). Some localities (along the B and C rows) exhibited a higher percentage of silty sands. Refusal occurred at few locations (F360, K0, K200, J200, and G400) between 6 and 12 ft bgs. Copies of the boring logs from the Phase I RI are included in Appendix A.

5.2.7 Soil Screening Results

VOCs were reported in 2 of the original 54 direct push samples collected from Areas C and north of C. The highest concentrations of VOCs, which ranged up to 283.18 μg/kg of toluene, were reported in the sample from C100 at 11.5 ft (Table 5.2-1). The reported concentration of benzene in the sample collected from location C100 exceeded the NY State comparison criteria. The reported concentrations of 1,1-DCE, toluene, and TCE exceeded $1/10^{th}$ of the NY State

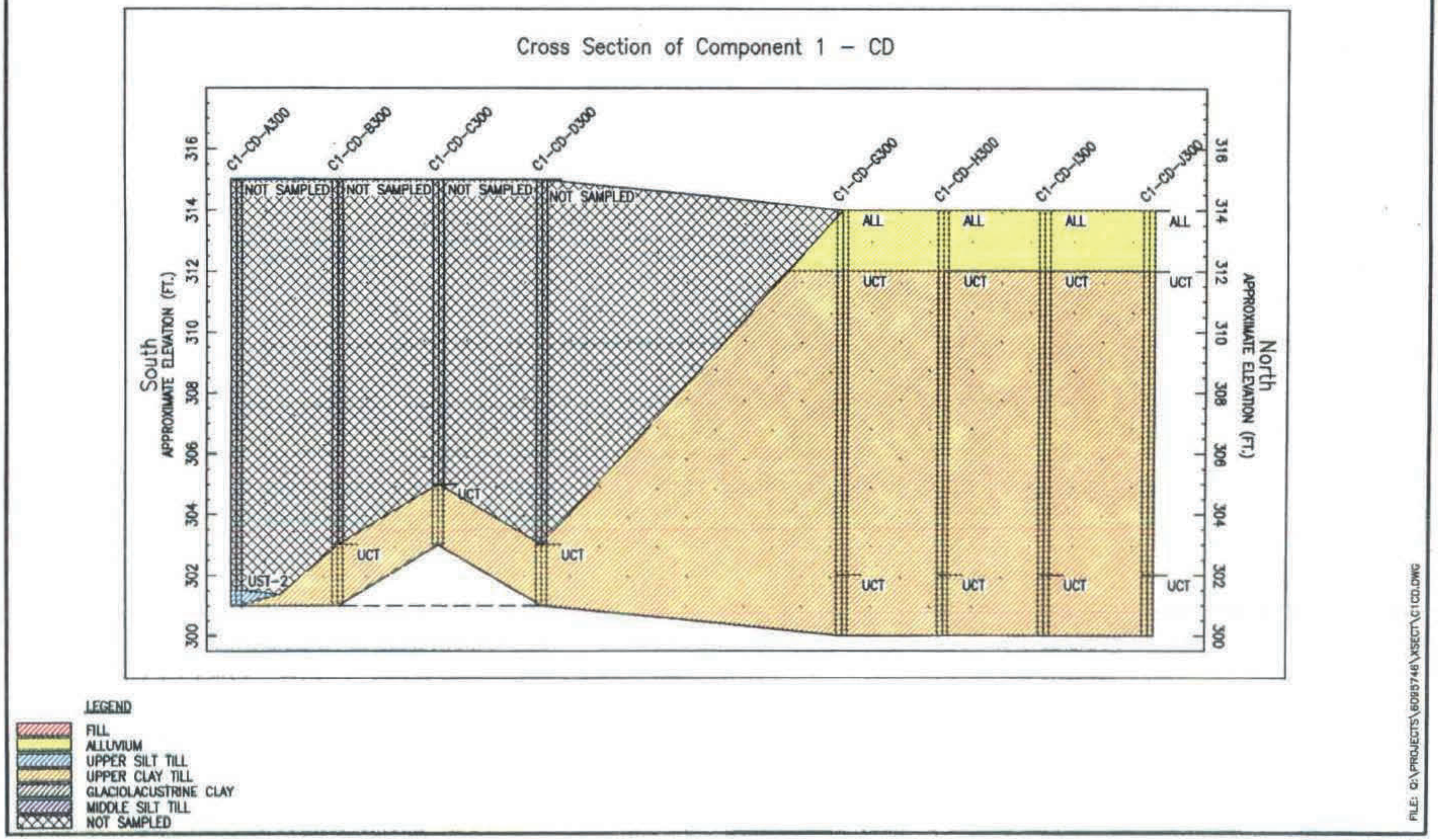

Cross Section of Component 1 - CD
South
APPROXIMATE ELEVATION (FT.)
North
APPROXIMATE ELEVATION (FT.)
C1-CD-A300
C1-CD-B300
C1-CD-C300
C1-CD-D300
C1-CD-G300
C1-CD-H300
C1-CD-I300
C1-CD-J300
NOT SAMPLED
ALL
UCT
UST-2
316
314
312
310
308
306
304
302
300
LEGEND
FILL
ALLUVIUM
UPPER SILT TILL
UPPER CLAY TILL
GLACIOLACUSTRINE CLAY
MIDDLE SILT TILL
NOT SAMPLED
FILE: Q:\PROJECTS\6093748\XSECT\C1CD.DWG

FIGURE 5.2-3

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comparison criteria in the same sample. The reported concentration of 1,1-DCE in the sample collected from location K360 (13.5 ft) exceeded 1/10th of the NY State comparison criteria.

PAHs were reported in all of the original soil samples submitted for screening. However, the reported total PAH concentration did not exceed the NY State comparison criteria. Total PAH concentrations reported in samples collected from locations A0, D300, D360I300, I360, J300, and K300 exceeded 1/10th of the NY State comparison criteria.

TNT was reported in location C300 at 11.5 ft with a concentration of 770 µg/kg. This concentration did not exceed 1/10th of the NY State comparison criteria.

PCB were not reported in the soil samples collected from Areas C and north of C.

5.2.8 Laboratory Analyses and Confirmatory Soil Sample Results

Due to the reported presence of VOCs in sample C100 at 11.5, and TNT in sample C300 at 11.5 ft these locations were re-sampled, re-screened, and submitted for confirmatory laboratory analysis subsequent to the field screening of the original sample. Also, due to its location down gradient of an area of historical ground disturbance (currently under SLF7) and its proximity to Areas A and B, K360 was re-sampled, re-screened, and submitted for laboratory analysis. The sample depths for soil collected for laboratory analysis differed slightly from the original soil sample depths.

The samples collected from C300 and K360 were analyzed for DOD marker compounds (boron, lithium, and explosives) as discussed in the final work plan (EA 1998a). Due to its close proximity to the drum trench that was discovered in Area C, the sample collected from C110 was analyzed for full suite TCL/TAL analytes, boron, lithium, and explosives.

<u>Re-screening Results</u>

Benzene and toluene were reported in the sample re-collected from C100. The screening result for benzene exceeded the NY State comparison criteria. Trans 1,2-DCE and TCE, reported in the original sample from this location, were not reported in the re-sample. The reported concentration of toluene and total PAHs exceeded 1/10th of the NY State comparison criteria.

TNT was reported in the re-sample collected from C300. In addition, the total PAH concentration reported in the recollected sample exceeded 1/10th of the NY State comparison criteria.

1,1,1-TCA, benzene, PCE, and toluene were reported in the re-sample from K360; these were not reported in the original sample from that location. The concentration of benzene exceeded 1/10th of the NY State comparison criteria.

Laboratory Results

The laboratory analysis for VOCs for C100 reported an estimated concentration of toluene and methylene chloride. The concentration of benzene reported in the screening result was below the reporting limit for the laboratory and, therefore, was not expected in the laboratory data. The reported laboratory concentration of methylene chloride exceeded the NY State comparison criteria. The summary of detected analytes for soil are located in Table 5.2-2.

SVOCs, primarily consisting of PAHs, and pesticides were reported in the laboratory results for C100. These concentrations did not exceed the NY State comparison criteria. However, the reported concentrations of benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, and dibenz[a,h]anthracene exceeded 1/10th of the comparison criteria.

The reported concentration of iron exceeded the NY State comparison criteria in the sample collected from C100. Several additional metals exceeded 1/10th of the comparison criteria. Although boron and lithium do not have NY State comparison criteria values, the reported concentrations in the sample collected from C100 were elevated in comparison to reported concentrations in other samples collected during this Phase I investigation. This may suggest an impact from former DOD (AFP-68 or Navy IPPP) activities.

Although TNT was not reported in the screening result for C1-CD-SO-C100-12, it was reported in the laboratory result for that sample. The explosives 1,3,5-trinitrobenzene (TNB), 2,4 – dinitrobenzene (DNB), and nitrobenzene exceeded the NY State comparison criteria in the sample collected from C100.

PCB and cyanide were not reported in the laboratory results for C100.

Boron and lithium were reported in the laboratory results for the samples collected from C300 and K360. Although boron and lithium do not have NY State comparison criteria values, the reported concentration of boron in the sample collected from K360 were elevated in comparison to reported concentrations in other samples collected during this Phase I investigation. Explosives were reported in the sample collected from location C300. The concentration of 2,4-dinitrotoluene (DNT) exceeded 1/10th of the NY State comparison criteria.

5.2.9 Ground-Water Sampling Program and Results

A 2-in. temporary ground-water sampling point was installed in location F300. Although no constituents of potential concern were reported in the soil screening results for this location, the lithology suggested the presence of a water-bearing zone at 13.5 ft bgs. The screening interval for the sampling point was set at 9 to14 ft bgs. A ground-water sample was collected and analyzed for total and dissolved boron and lithium, and explosives. A summary of the detected analytes in ground water is located in Table 5.2-3.

Boron and lithium were reported in the ground-water sample from F300, in concentrations less than the screening criteria. RDX was reported at a concentration of 0.48 μg/L.

5.2.10 Conclusions and Recommendations

Results indicate the major impact to the area is a result of the drum trench located in the vicinity of the C line. This is most likely the drum trench described by Olin representatives in the 1980s (Acres 1989b).

The type of constituents reported in samples collected from within the drum trench are indicative of potential COPC associated with DOD AFP-68 and the Navy IPPP. An impact from former LOOW activities is also evidenced by the reported explosives in this area. Likewise, the former LOOW TNT waste line is located approximately 30 ft north of the drum trench. Possible COPC from this line may be impacting the subsurface. It should be noted that the waste line is already identified for removal (Weston 1997b).

It is recommended that the drums and impacted soil from the drum trench be removed and confirmatory sampling be performed. Although the areal extent of impact to ground water is expected to be minimal, this should be verified.

The elevated PAHs reported in the subsurface soil samples collected from locations A0, D300, and D360 are recommended for further investigation. Because of the potential impact from non-

DOD site use (URS 1986), the reported PAHs in subsurface soil samples collected from I360, I300, J300 and K300 are not eligible for further investigation under this HTRW project.

With the exception of the samples collected within and directly adjacent to the drum trench, the metals concentrations reported in the soil samples collected from within Area C and north of C appear to be indicative of site-specific background concentrations. However, a background metals concentration evaluation is recommended to more completely evaluate the reported metals concentrations.

In addition, boron concentrations exceeding background concentration in K360 may indicate that the northeastern portion of the area may have been impacted by DOD activities. However, there is evidence that this area may have also been impacted by non-DOD site use (URS 1986). As such, it is not eligible for further investigation under this HTRW project.

Table 5.2-1 Component 1, Areas C and North of C, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-SO-A0-9.5-10.0	C1-CD-SO-A100-9.5-10.0	C1-CD-SO-A200-11.5-12.0	C1-CD-SO-A300-13.5-14.0	C1-CD-SO-A360-11.5-12.0	C1-CD-SO-A360-11.5-12.0-DUP	C1-CD-SO-B0-9.5-10.0	C1-CD-SO-B200-11.5-12.0	C1-CD-SO-B300-13.5-14.0	C1-CD-SO-B360-11.5-12.0	C1-CD-SO-B360-11.5-12.0-DUP	C1-CD-SO-B85-9.5-10.0	C1-CD-SO-BP1-8.0	C1-CD-SO-BP1-8.0-DUP
E4035	PAH	UG/KG	10000	NYTAGM	1068	955	931	469	398	528	382	543	285	275	NA	903	771	NA
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE											NA			NA
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM						NA								
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM						NA								
GC	BENZENE	UG/KG	60	NYTAGM						NA								
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM						NA								
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM						NA								
GC	O-XYLENE	UG/KG	1200	NYTAGM						NA								
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM						NA								
GC	TOLUENE	UG/KG	1500	NYTAGM						NA								
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM						NA								
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM						NA								

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.2-1 Component 1, Areas C and North of C, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-SO-A0-9.5-10.0	C1-CD-SO-C0-11.5-12.0	C1-CD-SO-C100-11.5-12.0	C1-CD-SO-C100-11.5-12.0-DUP	C1-CD-SO-C100-12-REP	C1-CD-SO-C300-11.5-12.0	C1-CD-SO-C300-12-REP	C1-CD-SO-C360-13.5-14.0	C1-CD-SO-D0-13.5-14.0	C1-CD-SO-D100-13.5-14.0	C1-CD-SO-D200-11.5-12.0	C1-CD-SO-D200-11.5-12.0-DUP	C1-CD-SO-D300-13.5-14.0
E4035	PAH	UG/KG	10000	NYTAGM	1068	347	300	303	1922	405	1063	664	780	780	480	NA	1007
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE						770	420					NA	
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM				NA									
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM			176.82	NA									
GC	BENZENE	UG/KG	60	NYTAGM			89.04	NA	196.11								
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA									
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA									
GC	O-XYLENE	UG/KG	1200	NYTAGM				NA									
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				NA			1.23						
GC	TOLUENE	UG/KG	1500	NYTAGM			283.18	NA	176.79								
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM			16.37	NA									
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			114.23	NA									

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.2-1 Component 1, Areas C and North of C, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-SO-A0-9.5-10.0	C1-CD-SO-D360-13.5-14.0	C1-CD-SO-E0-9.5-10.0	C1-CD-SO-E0-9.5-10.0-DUP	C1-CD-SO-E100-11.5-12.0	C1-CD-SO-E100-11.5-12.0-DUP	C1-CD-SO-E200-12.5-13.0	C1-CD-SO-E300-13.5-14.0	C1-CD-SO-E360-9.5-10.0	C1-CD-SO-F0-9.5-10.0	C1-CD-SO-F100-13.5-14.0	C1-CD-SO-F200-13.5-14.0	C1-CD-SO-F300-13.5-14.0
E4035	PAH	UG/KG	10000	NYTAGM	1068	1249	260	265	271	303	583	956	962	377	494	449	449
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE													
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM				NA		NA							
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM				NA		NA							
GC	BENZENE	UG/KG	60	NYTAGM				NA		NA							
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA		NA							
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA		NA							
GC	O-XYLENE	UG/KG	1200	NYTAGM				NA		NA							
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				NA		NA							
GC	TOLUENE	UG/KG	1500	NYTAGM				NA		NA							
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM				NA		NA							
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM				NA		NA							

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.2-1 Component 1, Areas C and North of C, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-SO-A0-9.5-10.0	C1-CD-SO-F360-13.5-14.0	C1-CD-SO-G0-9.5-10.0	C1-CD-SO-G100-11.5-12.0	C1-CD-SO-G200-13.5-14.0	C1-CD-SO-G300-13.5-14.0	C1-CD-SO-H0-9.5-10.0	C1-CD-SO-H100-9.5-10.0	C1-CD-SO-H200-11.5-12.0	C1-CD-SO-H300-13.5-14.0	C1-CD-SO-H360-13.5-14.0	C1-CD-SO-I0-7.5-8.0	C1-CD-SO-I100-9.5-10.0	C1-CD-SO-I200-11.5-12.0
E4035	PAH	UG/KG	10000	NYTAGM	1068	459	561	817	977	753	836	235	359	872	807	898	271	693
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM														
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM														
GC	BENZENE	UG/KG	60	NYTAGM														
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM														
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM														
GC	O-XYLENE	UG/KG	1200	NYTAGM														
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM														
GC	TOLUENE	UG/KG	1500	NYTAGM														
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM														
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM														

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.2-1 Component 1, Areas C and North of C, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-SO-A0-9.5-10.0	C1-CD-SO-I300-13.5-14.0	C1-CD-SO-I360-13.5-14.0	C1-CD-SO-I360-13.5-14.0-DUP	C1-CD-SO-J0-11.5-12.0	C1-CD-SO-J100-9.5-10.0	C1-CD-SO-J200-10.5-11.0	C1-CD-SO-J300-13.5-14.0	C1-CD-SO-J360-13.5-14.0	C1-CD-SO-J360-13.5-14.0-DUP	C1-CD-SO-K0-7.5-8.0	C1-CD-SO-K100-7.5-8.0	C1-CD-SO-K200-10.0-10.5
E4035	PAH	UG/KG	10000	NYTAGM	1068	1085	1280	1264	370	370	211	1179	519	NA	345	361	243
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE										NA			
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM				NA									
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM				NA									
GC	BENZENE	UG/KG	60	NYTAGM				NA									
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA									
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA									
GC	O-XYLENE	UG/KG	1200	NYTAGM				NA									
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				NA									
GC	TOLUENE	UG/KG	1500	NYTAGM				NA									
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM				NA									
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM				NA									

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.2-1 Component 1, Areas C and North of C, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-SO-A0-9.5-10.0	C1-CD-SO-K300-13.5-14.0	C1-CD-SO-K360-13.5-14.0	C1-CD-SO-K360-13.5-14.0-DUP	C1-CD-SO-K360-14.0-DUP-REP	C1-CD-SO-K360-14.0-REP	C1-CD-SO-TP2-17-8-1-REP	C1-CD-SO-TP2-17-8-2.0	C1-CD-SO-TP3-12-10-REP	C1-CD-SO-TP4-12-9.0
E4035	PAH	UG/KG	10000	NYTAGM	1068	1080	773	NA	578	645	28148	11076	611	925
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE				NA						
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM				NA	NA	9.88			NA	NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM			48.18	NA	NA		19.1		NA	NA
GC	BENZENE	UG/KG	60	NYTAGM				NA	NA	6.47		260.34	NA	NA
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA	NA		52849.04		NA	NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA	NA		1220.84		NA	NA
GC	O-XYLENE	UG/KG	1200	NYTAGM				NA	NA		485.5		NA	NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				NA	NA	1.47	1.71		NA	NA
GC	TOLUENE	UG/KG	1500	NYTAGM				NA	NA	26.77	561.7	351.56	NA	NA
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM			0.19	NA	NA				NA	NA
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			0.08	NA	NA				NA	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.2-2 Component 1, Areas C and North of C, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-SO-C100-12-REP	C1-CD-SO-C300-12-DUP	C1-CD-SO-C300-12-REP	C1-CD-SO-K360-14.0-REP	C1-CD-SO-TP1-20-6-REP	C1-CD-SO-TP2-17-8-1-REP	C1-CD-SO-TP3-12-10-REP
E160.3	PERCENT MOISTURE	%			12.5	NA	NA	NA	13.8	8.7	10.2
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	7420 *	NA	NA	NA	10100	5020 *	2360 •
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.44 BN*	NA	NA	NA	0.63 BN	0.2 BN*	0.17 BN*
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	2.8	NA	NA	NA	2.9	3.5	1.5
SW6010	BARIUM	MG/KG	300	NYTAGM	89.7	NA	NA	NA	121	82.9	43
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.28 B	NA	NA	NA	0.38 B	0.14 B	0.03 B
SW6010	BORON	MG/KG			225	9.3 B	9.8 B	17.6	121	42.2	
SW6010	CALCIUM	MG/KG			46200	NA	NA	NA	50100	37300	26500
SW6010	CHROMIUM	MG/KG	50	NYTAGM	12.7 *	NA	NA	NA	14.7	7 *	3.3 •
SW6010	COBALT	MG/KG	30	NYTAGM	6.6	NA	NA	NA	9.2	5.2	2.1 B
SW6010	COPPER	MG/KG	50	NYTAGM-BG	23.1 N	NA	NA	NA	29.1	30.5 N	15.6 N
SW6010	IRON	MG/KG	2000	NYTAGM	16900	NA	NA	NA	24900	12500	6020
SW6010	LEAD	MG/KG	400	NYTAGM	4.6 *	NA	NA	NA	7.6 *	2.9 *	1.6 *
SW6010	LITHIUM	MG/KG			98.2 *	27.4	35.3	22.3	271	23.5 *	5.9 •
SW6010	MAGNESIUM	MG/KG			9620	NA	NA	NA	9030 N	6840	5040
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	671	NA	NA	NA	835	643	445
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	14.7 *	NA	NA	NA	19.7	12 *	6.9 *
SW6010	POTASSIUM	MG/KG			1950 *	NA	NA	NA	2000	874 *	456 •
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG		NA	NA	NA	1.2	0.3 B	
SW6010	SILVER	MG/KG	4.9	NYTAGM-BG		NA	NA	NA	0.43 B		
SW6010	SODIUM	MG/KG			974	NA	NA	NA	449	187	116
SW6010	VANADIUM	MG/KG	150	NYTAGM	14	NA	NA	NA	20.2 E	10.9	4.2 B
SW6010	ZINC	MG/KG	76	NYTAGM-BG	35.5 N*	NA	NA	NA	44.6 N	25.7 N*	12.5 N*
SW8081	4,4'-DDD	UG/KG	2900	NYTAGM		NA	NA	NA			0.45 P
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM	0.58	NA	NA	NA			
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM		NA	NA	NA		0.26 P	
SW8081	ALDRIN	UG/KG	41	NYTAGM	0.35 P	NA	NA	NA		0.68	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.2-2 Component 1, Areas C and North of C, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-SO-C100-12-REP	C1-CD-SO-C300-12-DUP	C1-CD-SO-C300-12-REP	C1-CD-SO-K360-14.0-REP	C1-CD-SO-TP1-20-6-REP	C1-CD-SO-TP2-17-8-1-REP	C1-CD-SO-TP3-12-10-REP
SW8081	ALPHA-BHC	UG/KG	110	NYTAGM	0.46 P	NA	NA	NA			
SW8081	BETA-BHC	UG/KG	200	NYTAGM	0.73 J	NA	NA	NA			
SW8081	ENDRIN	UG/KG	100	NYTAGM	0.77	NA	NA	NA			
SW8081	GAMMA-BHC	UG/KG	60	NYTAGM		NA	NA	NA			0.25
SW8081	GAMMA-CHLORDANE	UG/KG	540	NYTAGM	0.31 P	NA	NA	NA		0.23 P	
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	0.54 P	NA	NA	NA		1.5 P	1.1 P
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM	0.18 P	NA	NA	NA		0.48 P	
SW8260B	BENZENE	UG/KG	60	NYTAGM		NA	NA	NA	180 J	2700	
SW8260B	ETHYLBENZENE	UG/KG	5500	NYTAGM		NA	NA	NA		310	
SW8260B	METHYLENE CHLORIDE	UG/KG	100	NYTAGM	7200	NA	NA	NA			
SW8260B	TOLUENE	UG/KG	1500	NYTAGM	94 J	NA	NA	NA		880	
SW8260B	XYLENES, TOTAL	UG/KG	1200	NYTAGM		NA	NA	NA		2600	
SW8270C	BENZYL BUTYL PHTHALATE	UG/KG	50000	NYTAGM		NA	NA	NA	140		
SW8270C	BIS(2-ETHYLHEXYL) PHTHALAT	UG/KG	50000	NYTAGM	440	NA	NA	NA			
SW8270C	DIBENZOFURAN	UG/KG	6200	NYTAGM		NA	NA	NA		730	
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM	120	NA	NA	NA		660	
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM	13	NA	NA	NA			
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM	32	NA	NA	NA		340 D	
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM	50	NA	NA	NA		2.1	
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	78	NA	NA	NA	1.4	11	3.2
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	64	NA	NA	NA		4	1.9
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	34	NA	NA	NA	0.72	0.97	
SW8310	CHRYSENE	UG/KG	400	NYTAGM	34	NA	NA	NA		98	0.71
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM	5.2	NA	NA	NA			
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	89	NA	NA	NA	2.1	1900 D	
SW8310	FLUORENE	UG/KG	50000	NYTAGM	5.6	NA	NA	NA		560 D	
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM	22	NA	NA	NA		3	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.2-2 Component 1, Areas C and North of C, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-SO-C100-12-REP	C1-CD-SO-C300-12-DUP	C1-CD-SO-C300-12-REP	C1-CD-SO-K360-14.0-REP	C1-CD-SO-TP1-20-6-REP	C1-CD-SO-TP2-17-8-1-REP	C1-CD-SO-TP3-12-10-REP
SW8310	NAPHTHALENE	UG/KG	13000	NYTAGM	9.7	NA	NA	NA		2000	
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	45	NA	NA	NA	3.1	6100 D	5
SW8310	PYRENE	UG/KG	50000	NYTAGM	71	NA	NA	NA	1.9	190	1.1
SW8330	1,3,5-TRINITROBENZENE	MG/KG	4	NYGUIDANCE	13		0.22				
SW8330	2,4,6-TRINITROTOLUENE	MG/KG	40	NYGUIDANCE	18						
SW8330	2,4-DINITROTOLUENE	MG/KG	1	NYGUIDANCE	12		0.17				
SW8330	2-AMINO-4,6-DINITROTOLUENE	MG/KG			22						
SW8330	2-NITROTOLUENE	MG/KG	800	NYGUIDANCE	22						
SW8330	3-NITROTOLUENE	MG/KG	800	NYGUIDANCE	24						
SW8330	4-AMINO-2,6-DINITROTOLUENE	MG/KG			28						
SW8330	4-NITROTOLUENE	MG/KG	800	NYGUIDANCE	23						
SW8330	HMX	MG/KG			20						
SW8330	M-DINITROBENZENE	MG/KG	8	NYGUIDANCE	11						
SW8330	NITROBENZENE	MG/KG	0.2	NYTAGM	13						
SW8330	RDX	MG/KG	64	NYGUIDANCE	26						
SW8330	TETRYL	MG/KG			21						

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 5.2-3 Component 1, Areas C and North of C, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-GW-F300	C1-CD-GW-TP1
SW6010	ALUMINUM	T	UG/L			NA	761000
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	NA	21.4
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD	NA	88.5
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	NA	7280
SW6010	BERYLLIUM	T	UG/L	3	NYGUIDANCE	NA	31.6
SW6010	BORON	D	UG/L	1000	NYSTANDARD	85.3 B	NA
SW6010	BORON	T	UG/L	1000	NYSTANDARD	75.3 B	232000
SW6010	CALCIUM	T	UG/L			NA	2960000 E*
SW6010	CHROMIUM	T	UG/L	50	NYSTANDARD	NA	1120
SW6010	COBALT	T	UG/L			NA	727
SW6010	COPPER	T	UG/L	200	NYSTANDARD	NA	3130
SW6010	IRON	T	UG/L	300	NYSTANDARD	NA	1630000 E*
SW6010	LEAD	T	UG/L	25	NYSTANDARD	NA	875
SW6010	LITHIUM	D	UG/L			33.3	NA
SW6010	LITHIUM	T	UG/L			39.8	351000
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	NA	715000 *
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	NA	53400 *
SW6010	NICKEL	T	UG/L			NA	1480
SW6010	POTASSIUM	T	UG/L			NA	123000 *
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	NA	388000 *
SW6010	VANADIUM	T	UG/L			NA	865
SW6010	ZINC	T	UG/L	300	NYSTANDARD	NA	6410
SW7470	MERCURY	T	UG/L	2	NYSTANDARD	NA	3.9
SW8081	4,4'-DDE	N	UG/L	0	NYSTANDARD	NA	0.04 P
SW8081	4,4'-DDT	N	UG/L	0	NYSTANDARD	NA	0.07
SW8081	BETA-BHC	N	UG/L	0	NYSTANDARD	NA	0.32 P
SW8081	DIELDRIN	N	UG/L	0	NYSTANDARD	NA	0.05 P

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.2-3 Component 1, Areas C and North of C, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-GW-F300	C1-CD-GW-TP1
SW8081	ENDOSULFAN SULFATE	N	UG/L			NA	0.03 P
SW8081	ENDRIN ALDEHYDE	N	UG/L	5	NYSTANDARD	NA	0.32
SW8081	HEPTACHLOR EPOXIDE	N	UG/L	0	NYSTANDARD	NA	0.79 P
SW8151	PENTACHLOROPHENOL	N	UG/L			NA	1.2
SW8260B	2-BUTANONE	N	UG/L	50	NYGUIDANCE	NA	230
SW8260B	ACETONE	N	UG/L	50	NYGUIDANCE	NA	9600 D
SW8260B	BENZENE	N	UG/L	0.7	NYSTANDARD	NA	840
SW8260B	CARBON TETRACHLORIDE	N	UG/L	5	NYSTANDARD	NA	17
SW8260B	CHLOROFORM	N	UG/L	7	NYSTANDARD	NA	53
SW8260B	METHYLENE CHLORIDE	N	UG/L	5	NYSTANDARD	NA	8000 BD
SW8260B	TOLUENE	N	UG/L	5	NYSTANDARD	NA	12
SW8260B	XYLENES, TOTAL	N	UG/L	5	NYSTANDARD	NA	13
SW8270C	1,2,4-TRICHLOROBENZENE	N	UG/L	5	NYSTANDARD	NA	38
SW8270C	2,4,5-TRICHLOROPHENOL	N	UG/L			NA	710
SW8270C	2,4,6-TRICHLOROPHENOL	N	UG/L			NA	66
SW8270C	2,4-DICHLOROPHENOL	N	UG/L	1	NYSTANDARD	NA	22
SW8270C	2-NITROPHENOL	N	UG/L			NA	8
SW8270C	4-METHYLPHENOL	N	UG/L			NA	320
SW8270C	4-NITROPHENOL	N	UG/L			NA	9
SW8270C	PHENOL	N	UG/L	1	NYSTANDARD	NA	1200
SW8310	ACENAPHTHENE	N	UG/L	20	NYGUIDANCE	NA	2.2
SW8310	ANTHRACENE	N	UG/L	50	NYGUIDANCE	NA	0.15
SW8310	BENZ[A]ANTHRACENE	N	UG/L	0.002	NYGUIDANCE	NA	0.5
SW8310	BENZO[A]PYRENE	N	UG/L	0	NYSTANDARD	NA	0.26
SW8310	BENZO[B]FLUORANTHENE	N	UG/L	2	NYGUIDANCE	NA	0.35
SW8310	BENZO[GHI]PERYLENE	N	UG/L			NA	0.21
SW8310	BENZO[K]FLUORANTHENE	N	UG/L	0.002	NYGUIDANCE	NA	0.17

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = nc' lyzed
blank = tected

Table 5.2-3 Component 1, Areas C and North of C, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-CD-GW-F300	C1-CD-GW-TP1
SW8310	CHRYSENE	N	UG/L	0.002	NYGUIDANCE	NA	2.6
SW8310	DIBENZ[A,H]ANTHRACENE	N	UG/L			NA	0.03
SW8310	FLUORANTHENE	N	UG/L	50	NYGUIDANCE	NA	1.4
SW8310	FLUORENE	N	UG/L	50	NYGUIDANCE	NA	0.4
SW8310	INDENO[1,2,3-CD]PYRENE	N	UG/L	0.002	NYGUIDANCE	NA	0.13
SW8310	NAPHTHALENE	N	UG/L	10	NYGUIDANCE	NA	4.4
SW8310	PHENANTHRENE	N	UG/L	50	NYSTANDARD	NA	2
SW8310	PYRENE	N	UG/L	50	NYGUIDANCE	NA	0.97
SW8330	2,4,6-TRINITROTOLUENE	N	UG/L	5	NYSTANDARD		2.7
SW8330	2,4-DINITROTOLUENE	N	UG/L	5	NYSTANDARD		0.52
SW8330	2-AMINO-4,6-DINITROTOLUENE	N	UG/L				1.5
SW8330	4-AMINO-2,6-DINITROTOLUENE	N	UG/L				1.7
SW8330	NITROBENZENE	N	UG/L	5	NYSTANDARD		130 D
SW8330	RDX	N	UG/L	3.2	NYGUIDANCE	0.48	130 D
SW9012	CYANIDE	T	MG/L	0.1	NYSTANDARD	NA	0.46

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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5.3 WATERLINE CONSTRUCTION AREAS

5.3.1 Site Background

During the installation of a new waterline in 1986, CWM encountered four areas of visibly impacted soil that were later designated Waterline Construction Areas (WCA) 1 through 4. Limited data are available regarding the WCAs; however, CWM believes that these areas coincide with the locations of abandoned underground lines from the former LOOW TNT production facility (CWM 1993). Three of these WCAs, 2, 3, and 4, have been included in the Phase I RI. According to personnel at CWM, impacted soil from WCA1 was associated with a former LOOW UST that was removed by CWM. Because the UST was removed by CWM without USACE oversight, WCA1 is no longer eligible for investigation under this DERP-FUDS HTRW project.

WCA2 is located on the east side of the southern end of Marshall Street. WCA3 and WCA4 area located along M Street.

5.3.2 Field Reconnaissance and Surface Features

The WCAs are located within areas heavily used by CWM, in paved areas on the shoulder of roads receiving moderate traffic flow. Buildings currently being used by CWM are located adjacent to these WCAs.

WCA2 is located on the east side of Marshall Street, between Marshall Street and the CWM PCB Warehouse to the east. The PCB Warehouse was originally uses as the LOOW box factory. CWM SLF11 is located approximately 50 ft west of WCA2. RMU-1 is located approximately 200 ft southwest of WCA2. Approximately 50 ft southeast of WCA2 is a groundwater recovery and treatment system that was installed by CWM after discovery of a leaking underground storage tank (UST) south of the PCB warehouse.

WCA3 is in located approximately 200 ft south of an abandoned railroad bed, formerly used by the DOD, and approximately 60 ft south of a CWM truck scale along the north side of M Street in the vicinity of former LOOW area shop building (Building 722A). CWM Facultative Pond 3 is approximately 120 ft south of WCA3. The surface consists primarily of asphalt with one grass island on the east side of WCA3. Approximately 23.3 yd^3 of stained soil were excavated from this area and placed in SLF-11 by CWM during the construction of the waterline.

The area of investigation for WCA4 is located south of CWM's Aggressive Biological Treatment Unit (ABTU) Tank 58 on the south side of M Street. WCA4 was in the vicinity of the former LOOW supervisor's office (Building 704B). Another building was built in the same location during site ownership by AEC and site use by the Air Force for the Navy Interim Production Pilot Plant. The area of investigation is currently covered in grass and there is a surface water drainage that travels along the south side of M Street, north of the area of investigation for WCA4. Approximately 217 yd^3 of soil were removed from the excavation by CWM during the construction of the waterline

5.3.3 Soil Sampling Program

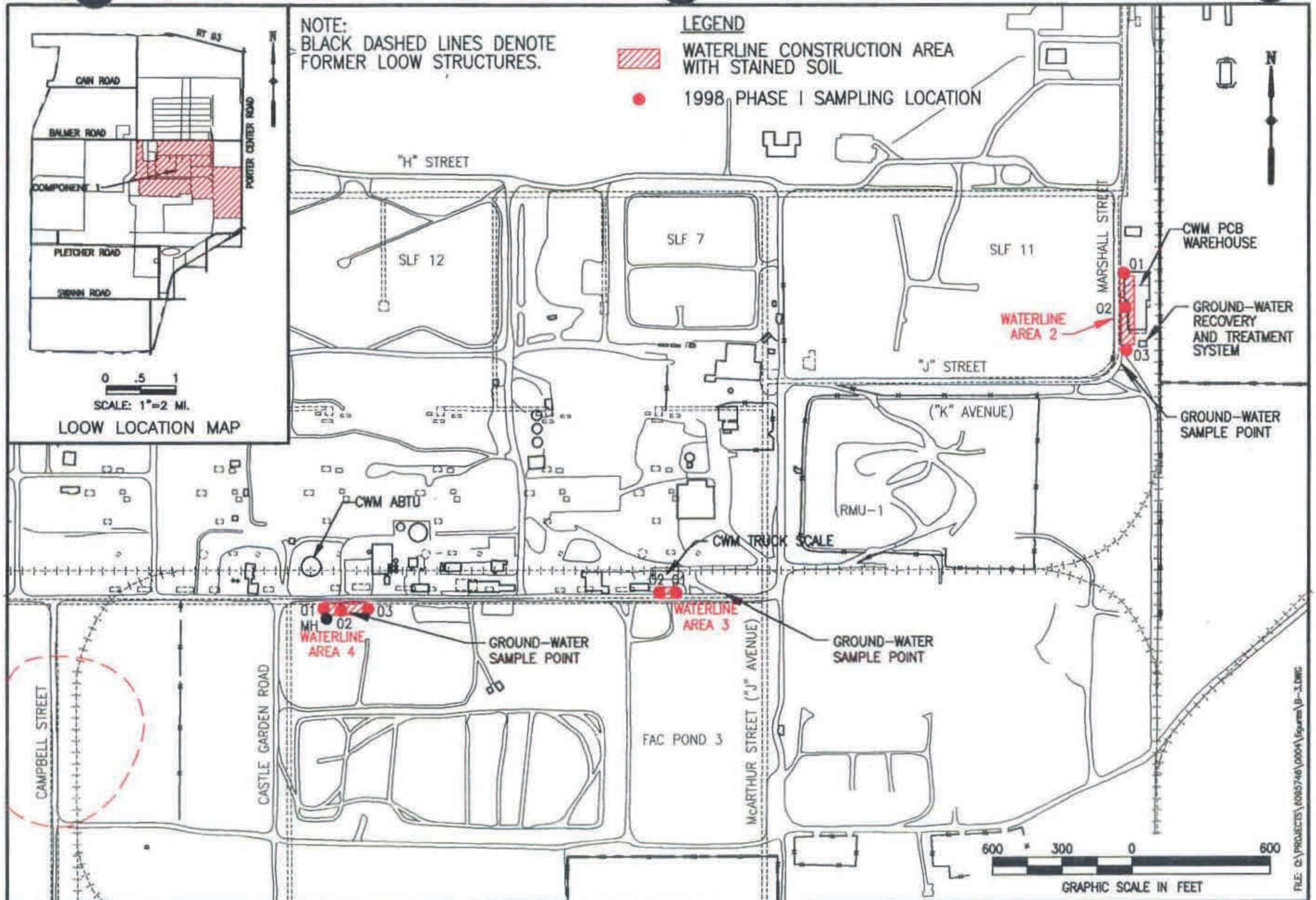
Field activities at the WCAs during the Phase I RI included collection of surface soil, subsurface soil, and ground-water samples. The ground-water sampling program is discussed in Section 5.3.7.

Soil sampling locations were placed adjacent to the areas of impacted soil, as described on the waterline construction plans provided by CWM (Krehbiel 1985). The exception to this is WCA4. The area of investigation for WCA4 was moved to a grassy area south of M Street due to the location of sampling points on the north side of M Street for the investigation of the Navy IPPP. Rather than duplicate sampling locations on M Street, the points were moved south, closer to the location of underground utility lines associated with the former LOOW and which may be associated with the impacted soil observed at WCA4. Results for the samples collected in association with the Navy IPPP are in Section 5.7.

A total of three subsurface soil samples were collected from three locations placed at WCA2 (Figure 5.3-1). Two soil sampling locations were placed at WCA3, and a total of two subsurface soil samples were collected. Due to the presence of asphalt, subsurface samples only were collected from WCAs 2 and 3. Three soil sampling locations were placed at WCA4. Surface soil and subsurface soil samples were collected from each location for a total of six soil samples. When encountered, samples of stained soil were collected for analyses.

Direct push technology was used to perform sampling at each location. Surface soil samples ranged in depth from 0 to 1 ft bgs. Subsurface soil samples ranged from 5.5 to 8 ft bgs.

Samples were used to describe site stratigraphy and were submitted for field screening of VOCs, PAHs, PCB, and TNT. Soil screening results were evaluated and locations exhibiting elevated



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 1 (CWM) WATERLINE CONSTRUCTION AREA SAMPLING LOCATIONS	DESIGNED BY DLR	DRAWN BY FDV	DATE JULY 1999	PROJECT NO. 60957.46
			CHECKED BY BCR	PROJECT MGR. HGP	SCALE AS SHOWN	FIGURE 5.3-1

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concentrations of potential constituents of concern were re-sampled, re-screened, and submitted for confirmatory laboratory analysis as discussed in Sections 5.3.5 and 5.3.6.

5.3.4 Site Stratigraphy

Surface Soil

Surface soil encountered at WCA4 generally consisted of pale to moderate brown, dry to moist, sandy and clayey silts. Due to past use, it is expected that the surface soil has been altered through grading. The UCT was generally encountered 2 to 4 ft bgs, immediately below the silt layer.

Subsurface Stratigraphy

Subsurface stratigraphy was generally characterized as moist to wet, mottled UCT with minor silt, fine sand, and/or gravel. The target unit for collection of a subsurface soil sample for field screening was the Upper Silt Till. This silt unit was discontinuous.

Black staining was observed in two of the locations at WC2 (most prominent at C1-WC2-SO-02). In most locations, the UCT layer was encountered from 2 to 4 ft bgs. A clayey silt layer was found to exist at location C1-WC2-SO-03 from 6 to 8 ft bgs. A wet sandy silt layer was found at C1-WC4-SO-02 from 4 to 6 ft bgs.

In general, little water was reported in subsurface strata at the WCAs. The presence of UCT between 2 and 10 ft bgs was common for most locations. The boring logs can be found in Appendix A.

5.3.5 Soil Screening Results

VOCs were reported in 5 of the original 11 samples collected from the WCAs, in concentrations that did not exceed the NY State comparison criteria (Table 5.3-1). PCB were reported in two of the samples. A total PCB concentration exceeding the NY State comparison criteria was reported in the results for the sample collected from WC4-1 at 0 ft to 0.5 ft bgs. The surface soil sample collected from location WCA4-2 reported concentrations of PCB exceeding 1/10th the NY State comparison criteria. PAHs were reported but did not exceed the NY State comparison criteria. However, the concentrations reported in samples collected from WCA2-1, WCA4-1, WCA4-2, and WCA4-3 exceeded 1/10th of the comparison criteria. TNT was not reported in the soil samples collected from the WCAs.

Analysis of stained soil by CWM at WCA2 during excavation of the area reported total VOCs over 60 mg/kg including carbon tetrachloride, 1,2-dichloroethene (1,2-DCE), 1,1-DCE, ethyl benzene, PCE, toluene, and TCE(CWM 1993). PCE and TCE were reported in the soil screening results for the stained soil at WCA2 during this Phase I RI, but in lower concentrations.

5.3.6 Laboratory Analyses and Confirmatory Soil Sample Results

Subsequent to obtaining the results indicating the presence of VOC in the sample collected from WC2-3 at 7.5 to 8 ft bgs, and in the sample collected from WC3-2 at 7 to 7.5 bgs, samples from those locations were recollected, re-screened, and submitted for confirmatory laboratory analysis (Table 5.3-2). These samples were submitted to the laboratory for analysis of boron, lithium, and explosives.

Although samples collected from this area were not proposed for laboratory analysis of PCB, due to the reported presence of PCB at WC4-1 and due to the lack of an adequate number of confirmatory samples for the PCB screening analysis, the surface soil location at WC4-1 was re-sampled, re-screened, and submitted for laboratory analysis of boron, lithium, and explosives, and PCB.

Re-screening Results

Concentrations of VOCs reported in WC2-3 were similar to those reported for the original sample from that location. The re-screening of WC3-2 reported TCE and cis 1,2-DCE, not reported in the original sample. The concentration of cis 1,2-DCE exceeded 1/10th of the NY State comparison criteria.

PCB and PAHs were reported in the recollected sample from WC4-01 in concentrations similar to the original sample results.

Laboratory Results

PCB were reported in the sample collected from WC4-01 in concentrations that did not exceed the NY State comparison criteria.

Boron, at concentrations below the contract required detection limit, and lithium were reported in each of the three samples submitted to the laboratory.

5.3.7 Ground-Water Sampling Program and Results

A ground-water sample was collected from each WCA included in the Phase I RI. As described in the Final Work Plan (EA 1998a), the ground-water samples were submitted for analysis of total and dissolved boron and lithium, and explosives (Table 5.3-3).

WCA2

Due to the reported presence of VOCs in the field screening results at WC2-3 at 7.5 ft bgs, and due to the apparent presence of a wet layer at 6 to 8 ft bgs, a 2-in. temporary ground-water sampling point was installed at this location. The screened interval was placed from 3 to 10 ft bgs. A ground-water sample was analyzed for DOD marker compounds by the contract laboratory, and by the USACE lab as a quality assurance measure. In addition, a duplicate, C1-WC2-DUP1 (parent sample is C1-WC2-GW-3), was also submitted for laboratory analysis by the contract laboratory.

The trace concentration of 1,3,5-TNB reported in the ground-water sample may indicate an impact from former DOD-LOOW use. The lack of elevated boron and lithium in the soil and ground-water from locations WCA2-3 suggest that the trace VOCs reported in the soil screening results are not related to former DOD (AFP-68 or Navy IPPP) disposal activities but they may be from possible storage activities when the area was used by the USAF and the USAEC.

WCA3

Although potential constituents of concern were not reported in the soil sample from location WC3-1 at 7 ft bgs, the lithology indicated the presence of a water-bearing zone. Therefore, a 2-in. temporary ground-water sampling point was installed at WC3-01. The screened interval was placed from 3 to 10 ft bgs.

Trace concentrations of 1,3,5-TNB in the ground-water sample indicate impact from former DOD-LOOW use. The reported concentration of boron exceeded 1/10th of the NY State comparison criteria. The elevated boron in the ground-water collected from location WCA3 suggest that the trace VOCs reported in the soil screening results may be related to former DOD

AFP-68 or Navy IPPP disposal activities or they may be from possible solvent use associated with the former LOOW shop building.

An investigation of the railroad bed north of WCA3 by Golder for CWM reported concentrations of trans-1,2-DCE, toluene, benzene, PCE, and TCE. However, due to its location of over 100 ft north of WCA3 it is unlikely that possible constituents from the railroad bed have impacted WCA3. CWM monitoring well F302S, located just south of M Street has not had reported VOCs.

WCA4

An attempt was made to collect a ground-water sample from location WCA4-1, where screening results indicated the presence of PCB. However, the location did not produce ground water. Therefore, a second attempt was made by placing a 2-in. temporary ground-water sampling point in location WC4-2, where trace concentrations of TCE were reported in the screening results. The screened interval was placed between 3 and 7 ft bgs.

The concentration of boron reported in the ground-water sample collected from WCA4 exceeded the NY State comparison criteria. The elevated boron may indicate that the trace VOCs reported in subsurface soil from the same location are the result of DOD AFP-68 or Navy IPPP activities. Also, trace concentrations of 1,3,5-TNB in the ground-water sample indicate a possible impact from former DOD-LOOW use.

5.3.8 Conclusions and Recommendations

There appears to be minimal impact from former DOD activities at the WCAs 2 and 3. Although there are some exceedances (total PAHs and cis-1,2 DCE) above 1/10th of the NY State comparison criteria, the concentrations of the reported constituents do not exceed the full value of the criteria within these areas. The elevated concentration of boron in the ground-water sample collected from WCA-4 exceeded the NY State comparison criteria, indicating a possible impact from former DOD (AFP-68 or Navy IPPP) activities. However, because the WCAs are located within an area heavily used by CWM and it's predecessors, the potential for impact to these areas from non-DOD site use is substantial. Impacts to areas in the vicinity of these WCAs have been documented (Golder 1993b). In addition, the extensive system of abandoned underground lines may have provided a preferential pathway for potential COPC from non-DOD use at these adjacent areas to enter the WCAs. Therefore, the WCAs are not eligible for further investigation under this HTRW project.

Table 5.3-1 Component 1, Waterline Construction Areas, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-WC2-SO-01-7.5-8.0	C1-WC2-SO-02-7.3-7.8	C1-WC2-SO-03-7.5-8.0	C1-WC2-SO-03-7.5-8.0-DUP	C1-WC2-SO-03-8-REP	C1-WC2-SO-03-8.0-DUP	C1-WC3-SO-01-7.0-7.5	C1-WC3-SO-02-7.0-7.5	C1-WC3-SO-02-8-REP	C1-WC4-SO-01-0.0-0.5	C1-WC4-SO-01-1-REP	C1-WC4-SO-01-7.5-8.0	C1-WC4-SO-02-0.0-0.5	C1-WC4-SO-02-5.5-6.0
E4020	PCB	UG/KG	1000	NYTAGM						NA				4620	4040		420	
E4035	PAH	UG/KG	10000	NYTAGM	3057	423	382	414	623	NA	555	717	286	1608	1172	392	1192	8
GC	BENZENE	UG/KG	60	NYTAGM	1.3	3.9		NA										
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA					67.68					
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA				98.23						
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM			3.79	NA	1.06	1.3								
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			10.66	NA	7.07	8			13.03				0.28	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.3-1 Component 1, Waterline Construction Areas, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-WC2-SO-01-7.5-8.0	C1-WC4-SO-03-0.0-0.5	C1-WC4-SO-03-7.0-7.5
E4020	PCB	UG/KG	1000	NYTAGM			
E4035	PAH	UG/KG	10000	NYTAGM	3057	1461	359
GC	BENZENE	UG/KG	60	NYTAGM	1.3		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM			
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM			
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM			
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			0.59

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.3-2 Component 1, Waterline Construction Areas, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-WC2-SO-03-8-REP	C1-WC3-SO-02-8-REP	C1-WC4-SO-01-1-REP
SW6010	BORON	MG/KG			3.8 B	5.2 B	6.5 B
SW6010	LITHIUM	MG/KG			11.8	18.4	24.7
SW8082	AROCLOR 1248	UG/KG	1000	NYTAGM	NA	NA	160
SW8082	AROCLOR 1260	UG/KG	1000	NYTAGM	NA	NA	72

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 5.3-3 Component 1, Waterline Construction Areas, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-WC2-GW-3	C1-WC2-GW-3-DUP	C1-WC3-GW-01	C1-WC4-GW-2
SW6010	BORON	D	UG/L	1000	NYSTANDARD	83.2 B	74.6 B	131	1550
SW6010	BORON	T	UG/L	1000	NYSTANDARD	85.6 B	74.8 B	118	1520
SW6010	LITHIUM	D	UG/L			48.9	27.9	9.8 B	7 B
SW6010	LITHIUM	T	UG/L			50.9	40	41.9	9.3 B
SW8330	1,3,5-TRINITROBENZENE	N	UG/L	5	NYSTANDARD	0.14		0.11	0.4

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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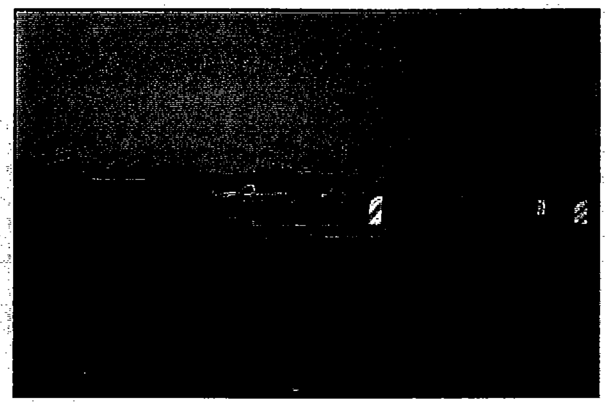
5.4 TRASH PIT

5.4.1 Site Background

A burn pit/trash pit was discovered by CWM during an excavation to install leachate lines for the leachate hydraulics controls upgrade (LHCU). Three drums, old batteries, a 25-mL amber bottle with red liquid, U.S. Navy drawings dated 1957, cut cable, and other debris was found in the pit. CWM excavated through the burn pit but did not remove all of the material. The pit is located in the vicinity of the nitration houses of the first production line of the former LOOW.

5.4.2 Field Reconnaissance and Surface Features

During the Phase I RI investigation a site reconnaissance was performed prior to establishing a sampling grid in the vicinity of the trash pit. Prior to intrusive work, coordinates for the trash pit were obtained from plans forwarded by CWM, and the location of the pit was reestablished using GPS (Golder 1994). The trash pit is located approximately 200 ft northwest of the CWM drum storage and handling building, and west of a CWM AST for water storage. This AST was formerly used by the DOD as a fuel oil tank in Area 14 of AFP-68. It has since been dismantled, cleaned, and reconstructed in its present location by CWM.



Photograph 5.4- 1 Area of the trash pit, looking north.

The surface consists of a packed gravel parking area underlain with geotextile (Photograph 5.4-1). CWM uses the western portion of the area to store empty roll-off containers. Electrical outlet stick-ups are located in the center of the parking area. These are used to keep the batteries of heavy equipment charged in colder months.

5.4.3 Geophysical Survey Program and Results

During the reconnaissance, plans of the LHCU line were obtained from CWM, and an inductive magnetic survey was performed to field locate the line. Additional underground lines were also located including an active underground electrical line and active water line that traverse the LHCU line.

5.4.4 Trenching Activities, Sampling Program, and Results

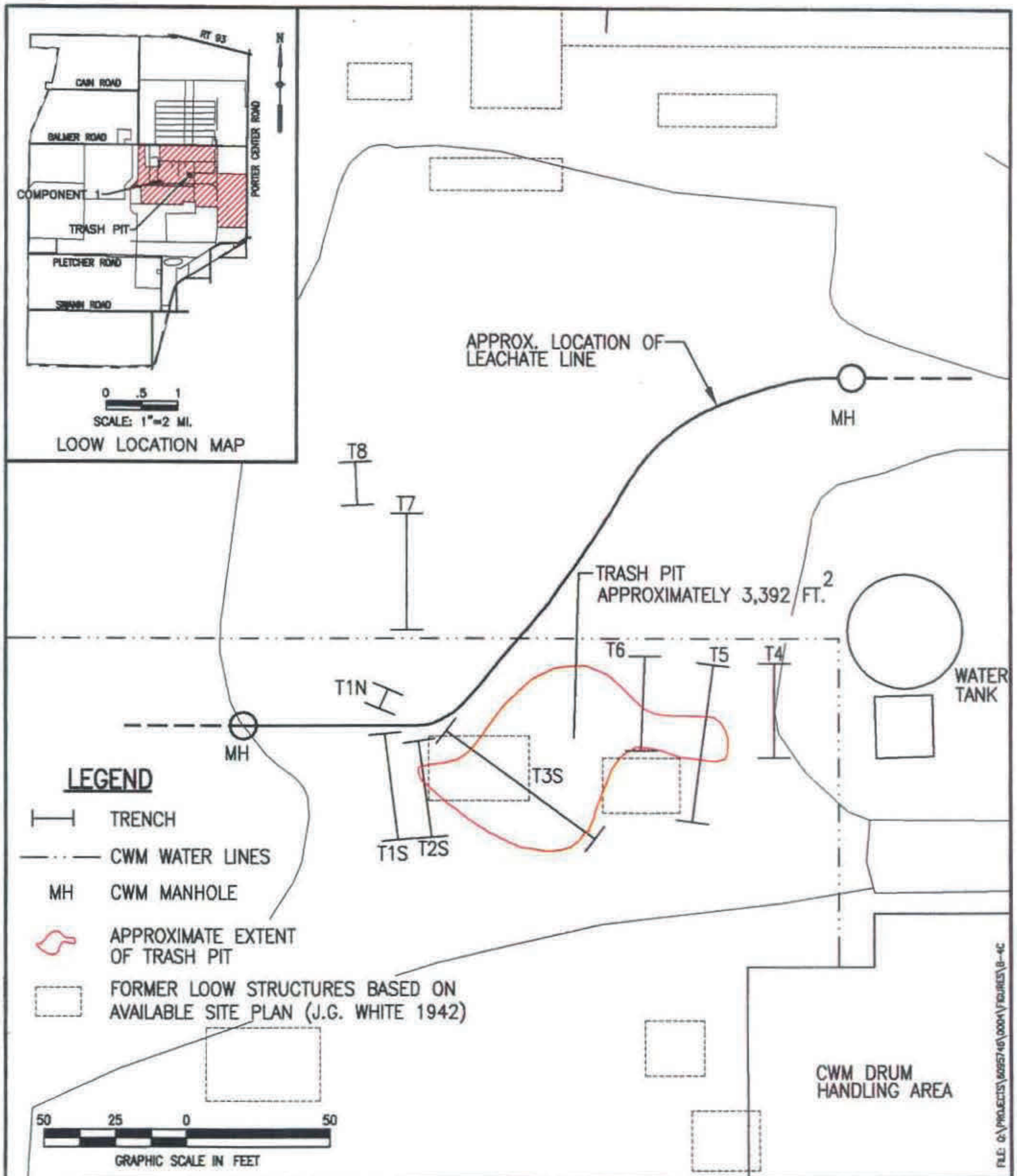
5.4.4.1 Trenching Activities

Trenching was performed in the area of the trash pit during this Phase I RI to evaluate the extent of the pit, or the extent of soil staining possibly associated with the pit. Test trenches, approximately 3 ft in width, were excavated perpendicularly to the suspected edge of the trash pit, trending away from the LHCU line. If debris or staining was encountered, the excavation was extended into an area devoid of staining.

A total of 9 test trenches were excavated, with final depths ranging from 3.5 to 13 ft bgs (Figure 5.4-1 and Table 5.4-1). Little or no staining was observed in test trenches TP1S, TP1N, TP4, TP7N, and TP8, indicating that these trenches are outside the extent of the trash pit. Slight staining was observed in the northern portion of TP2S at approximately 3 ft bgs.

Photograph 5.4- 2 Contents of TP3S.

Black staining was observed in TP3S, TP5, and TP6. The staining occurred between 3 ft and 6 ft bgs in the northern and middle areas of TP3S, decreasing in thickness and depth toward the southern end. The area of stained soil disappeared at approximately 59 ft from the northern end of TP3S. Debris, including bottles, metal, rebar, black fibrous material, and a valve manufactured by the WM Powell Co. were unearthed from TP3S (Photograph 5.4-2). The WM Powell Co. was contacted concerning the valve. Based on the serial number, they were able to determine that the valve was manufactured in 1950 (Hinkle 1998). Elevated organic vapor readings were recorded at the surface of the excavation at approximately 55 ft from the northern terminus of TP3S. Interviews with CWM personnel suggested that TP3S was the western extent of the pit and that the eastern extent was approximately 80 ft to the east of TP3S. Therefore, excavation activities recommenced with TP4 approximately 100 ft east of TP3S. No staining was observed in TP4. Test trenches were excavated west of TP4, until staining was observed in TP6, approximately 45 ft west of TP4.



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 1 (CWM) TRASH PIT AREA TRENCHES

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	DAB	FDV	SMS	AS SHOWN	JULY 1999	60957.46	5.4-1

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TABLE 5.4-1 RESULTS OF TRENCHING ACTIVITIES AT THE TRASH PIT

Designation	Length (ft)	Width (ft)	Depth (ft)	Contents	Interval of Staining	Was the trench located in the trash pit?	Samples Collected?
TP1N	13	3	6	• 2 Underground metal pipe lines (approximately 6-in. diameter) trending east-west. Probably former LOOW waterlines	None	No	No
TP1S	25	3	13	None	None	No	Yes (field screen and lab analysis)
TP2S	27	3.5	8	• Wood, garbage bags, and metal pipe	Slight staining at northern portion of trench 3ft bgs.	Yes	No
T3S	63	3	7.5	• Bottles, metal, rebar, black fibrous material, and a valve manufactured by Powell (in 1950) • Elevated organic vapor readings at the surface of the excavation approximately 55 ft from the northern terminus of trench	Black staining between 3 and 6 ft bgs in the northern and middle areas of the trench, decreasing in thickness and depth toward the southern end. The area of stained soil disappears at approximately 59 ft from the northern end of the trench.	Yes	Yes (field screen and lab analysis)
T4	34	3	6	• Concrete—possible former LOOW building foundation (possible the bi-trinitration house of the first TNT line)	None	No	Yes (field screen and lab analysis)
T5	56	3	6	• Several sections of concrete—possible former LOOW building foundations (possibly the bi-trinitration house of the first TNT line)	Black staining beginning approximately 25 ft from the northern terminus of the trench at a depth of 1 to 4 ft bgs. The staining extends an additional 10 ft south before pinching out at approximately 35 ft from the northern end of the trench.	Yes	No
T6	32	3	6	• Concrete—possible former LOOW building foundation (possibly the bi-trinitration house of the first TNT line).	Black staining approximately 20 ft from the northern terminus of the trench at a depth of 1 to 4 ft bgs. The staining extends 12 ft south before pinching out at approximately 32 ft from the northern end of the trench.	Yes	No
T7N	40	3	3.5	None	None	No	Yes (field screen and lab analysis)
T8	15	3	5	None	None	No	No

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TP5 was excavated approximately 22 ft west of TP4. Staining was observed beginning approximately 25 ft from the northern terminus of the trench at a depth of 1 to 4 ft bgs. The staining extended an additional 10 ft south before pinching out at approximately 35 ft from the northern end of TP5.

Within TP6, staining was observed approximately 20 ft from the northern terminus of the trench at a depth of 1 to 4 ft bgs. The staining extended 12 ft south before pinching out at approximately 32 ft from the northern end of TP6.

Results of the test trenching indicate that the location of the trash pit as shown on the CWM plans is most likely the northwest terminus of the pit. The main portion of the pit lies south of the LHCU pipeline, north of the road accessing the CWM drum storage facility, and west of the CWM water AST. Based on an average thickness of impact of 3 ft, as measured by soil staining, and an approximate area of 3,325 ft^2 as shown on Figure 5.4-1 approximately 10,000 ft^3 of soil may be impacted in this area from former DOD activities.

5.4.4.2 Test Trench Sampling Program and Results

A total of seven soil samples were collected from test pits 1S, 3S, 4, and 7N and were screened for VOCs, PAHs, PCB, and TNT (Table 5.4-1). A subset of those samples was sent to the laboratory for full suite TCL/TAL, boron, lithium, and explosives analysis. A description of the sample designation for samples collected from within the test pits is as follows. Following the "-SO" for the matrix identifier, is the test trench number ("-TP1S"), followed by the distance from the northern terminus of the test trench ("-10"), followed by the depth from within the test trench that the sample was taken ("-10"). Table 5.4-2 lists those samples that reported COPCs.

<u>Field Screening Results</u>

The sample collected from TP1S-10-10 reported TNT and PAHs in concentrations that did not exceed 1/10th of the NY State comparison criteria.

VOCs in exceedance of the NY State comparison criteria were reported in the soil screening results for the sample collected from TP3S-53-6 (6 ft bgs). PAHs were reported in concentrations below the screening criteria. PCB and TNT were not reported in the sample collected from TP3S-53-6. A sample collected beneath TP3S-53-6, at TP3S-53-7, reported VOCs exceeding 1/10th of the NY State comparison criteria but not the full value of the criteria. The sample collected just northwest of TP3S-53-6 at TP3S-46-6 reported concentrations of total

PAHs exceeding 1/10th of the NY State comparison criteria. VOCs and TNT were also reported in the sample collected from TP3S-46-6, but in concentrations that did not exceed 1/10th of the comparison criteria. A sample collected from TP3S-9-4 reported PAHs exceeding 1/10th of the comparison criteria.

PAHs were reported in the sample collected from TP-4-20-2 in concentrations that did not exceed 1/10th of the comparison criteria.

PAHs exceeded 1/10th of the NY State comparison criteria in the sample collected from TP7N-40-3.

Laboratory Analytical Results

VOCs in exceedance of the NY State comparison criteria were reported in the samples collected from TP3S-53-6 and TP3S-53-7. In addition, SVOCs were reported in concentrations exceeding the comparison criteria in the sample collected from a depth of 6 ft bgs from TP3S. A summary of laboratory analysis detections is listed in Table 5.4-3.

Pesticides were reported in samples collected from TP3S-53-6, TP4-20-2, and TP7N-40-3 in concentrations that did not exceed comparison criteria. However, the reported values are qualified, indicating a possible bias. In addition, the reported concentrations

PCB also exceeded the NY State comparison criteria in the sample collected from TP3S (6 ft bgs).

Iron exceeded the NY State comparison criteria in each of the samples collected from within the test pits. Antimony exceeded the criteria in the samples collected from TP3S-53-6 and TP4-20-2. Zinc and mercury exceeded the comparison criteria in the samples collected from TP4-20-2 and TP3S-53-6, respectively. Additional metals exceeded 1/10th of the NY State comparison criteria in each of the test pit samples. Although adequate background concentrations for boron and lithium have not been developed for this site, the concentration of boron and lithium in the sample collected from TP3S-53-6 were elevated in comparison with the boron and lithium concentrations reported for the majority of other soil samples collected during the Phase I investigation. This suggests a potential impact is associated with former DOD (AFP-68 or Navy IPPP) activities.

PAHs were reported in concentrations that did not exceed the NY State comparison criteria. However, concentrations of benzo[a]pyrene exceeded 1/10th of the comparison criteria in the samples collected from TP3S-53-6 and from TP7N-40-3. In addition, benzo[b]fluoranthene and dibenz[a,h]anthracene also exceeded 1/10th of the criteria in the sample collected from TP7N-40-3.

Cyanide and explosives were not reported in the laboratory results for the samples collected from within the test trenches at the trash pit.

The highest concentrations of potential COPC were reported in the sample collected from 6 ft bgs in TP3S. Although potential COPC were reported in the sample collected from the same location at 7 ft bgs, the number of exceedances and concentrations were considerably less than those reported in the sample collected from 7 ft bgs. This indicates that the contamination decreases significantly with depth once out of the zone of soil staining. The relatively high level of boron and lithium in the sample collected from 6 ft bgs indicates that this was a disposal area for DOD AFP-68 and Navy IPPP waste.

The laboratory results confirm that TP1S, TP4 and TP7N are not within the trash pit. However, the elevated PAHs reported in TP7N may indicate impact from the trash pit.

5.4.5 Direct Push Soil Sampling Program

In addition to the test trenching, field activities at the trash pit during the Phase I RI included collection of surface soil, subsurface soil, and a ground-water samples using direct push methodology. The ground-water sampling program is discussed in Section 5.4.9. The soil sampling program is discussed below.

A sampling grid with an approximately 100-ft interval was established across the trash pit, as defined during excavation (Figure 5.4-2). Grid points were given alpha-numeric designations, with A0 being the southwestern origin of the grid. Because trenching activities concluded that the trash pit did not extend as far to the north as originally anticipated, the northern line of the grid, the C line, was placed only 50 ft north of the B line.

In addition, five biased points were placed in the area. The first was located between TP3S and TP6, to evaluate the concentrations of expected contaminants in that area. The second was placed just west of TP1N to verify that section had not been impacted. The third was placed adjacent to the southern terminus of TP3S, to verify that the end of the test trench was out of the

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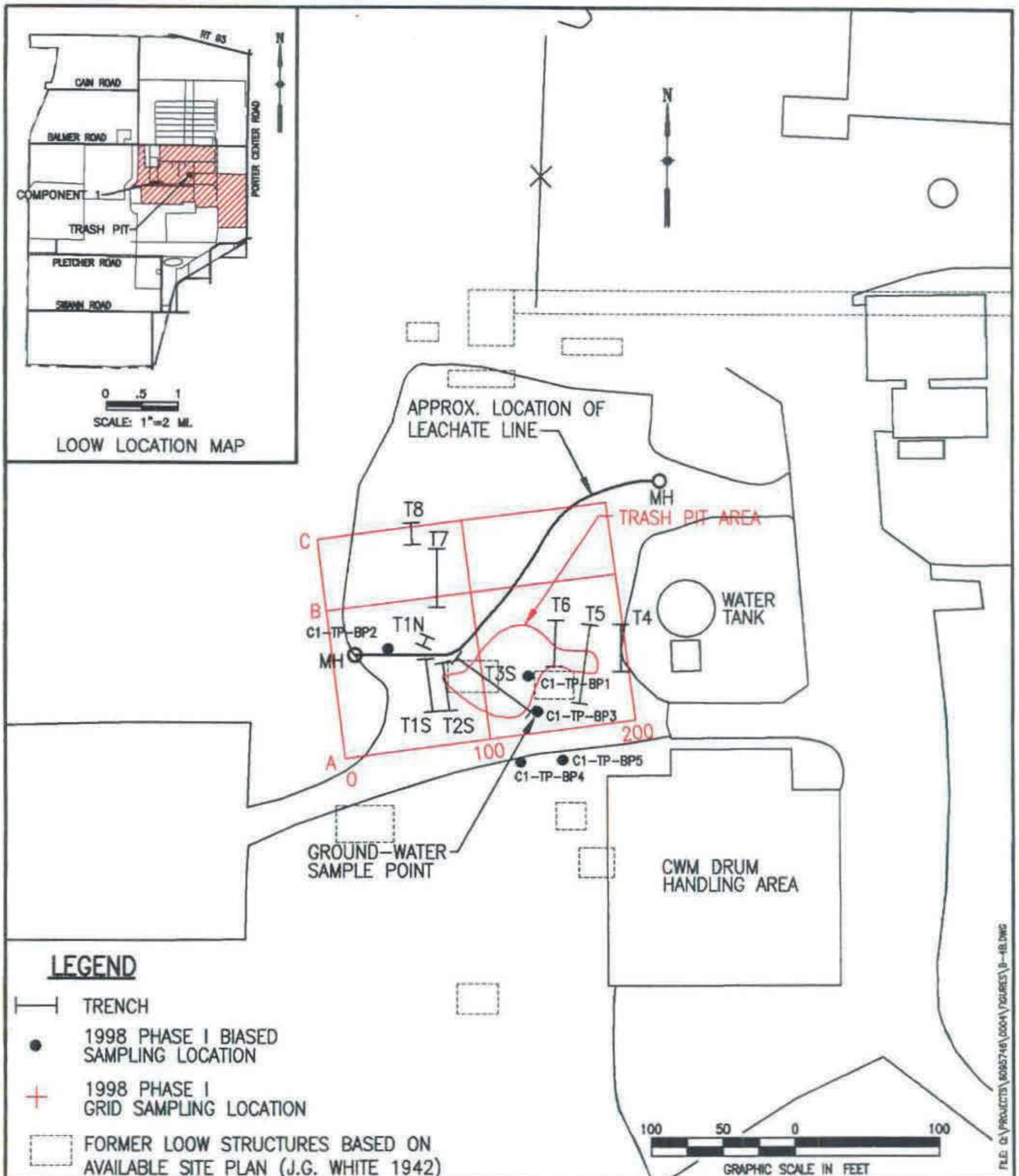

EA ENGINEERING, SCIENCE, AND TECHNOLOGY			BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK			COMPONENT 1 (CWM) TRASH PIT AREA SAMPLING GRID LOCATIONS	
PROJECT MGR HGP	DESIGNED BY DAB	DRAWN BY FDV	CHECKED BY SMS	SCALE AS SHOWN	DATE JULY 1999	PROJECT NO 60957.46	FIGURE 5.4-2

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area of impact. The soil screening results indicated that BP3 was not out of the area of impact, therefore two addition biased points, BP4 and BP5 were added to the south of BP3.

Direct push technology was used to perform sampling at each of the 14 locations. Surface soil samples were collected from beneath the gravel pack and geotextile, ranging in depth from 1.5 to 2 ft bgs, from each location except the biased points. Because the visual area of impact within the test trenches ranged between 3 to 7 ft bgs, a sample was collected from within this interval at each direct push location. An additional subsurface sample was collected from 13.5 to 14 ft bgs. Refusal was encountered at BP4, therefore, only one interval from 5.5 to 6 ft bgs was sampled.

Soil samples were used to describe site stratigraphy and were field screened for VOCs, PAHs, PCB, and TNT.

5.4.6 Site Stratigraphy

<u>Surface Soil</u>

Surface soil samples collected from the trash pit area range in composition from a UCT gravel mix (fill), to a thin layer of brown to gray-brown clayey silt, little sand and gravel (0.5 to 1 ft), with occasional black staining. Surface soil was generally dry to moist. Remnants of a geotextile fabric were observed in locations A0 and A200. Copies of the boring logs from the Phase I RI are included in Appendix A.

<u>Subsurface Stratigraphy</u>

Subsurface soil samples collected from the trash pit range from a moderate brown silty clay to sandy silt from depths of 4 to 14 ft bgs (Figure 5.4-3). Occasional staining was observed at some locations (BP4 and BP5) from depths 2 to 6 ft bgs. Subsurface samples were typically characterized as moist to wet.

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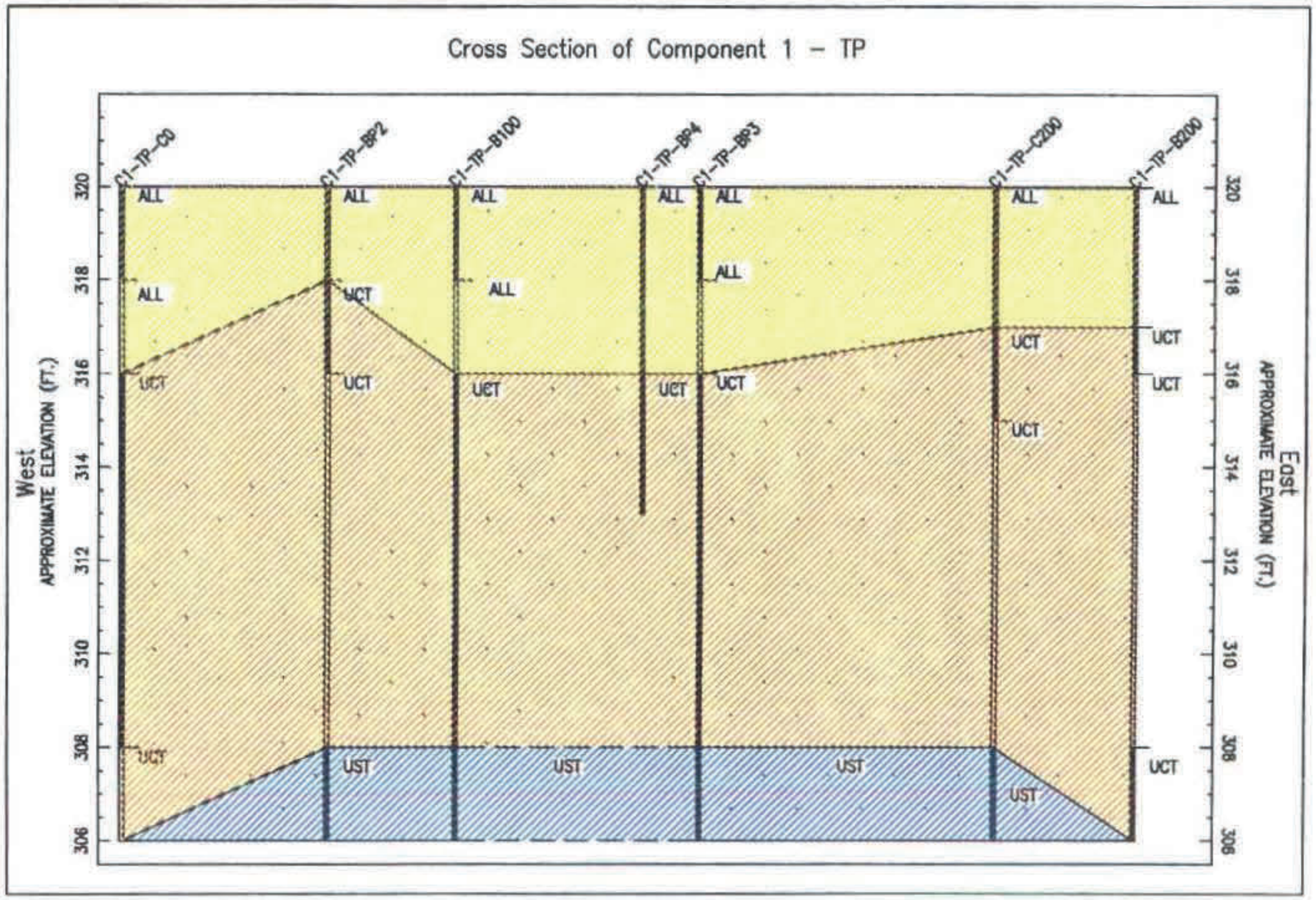

LEGEND

- FILL
- ALLUVIUM
- UPPER SILT TILL
- UPPER CLAY TILL
- GLACIOLACUSTRINE CLAY
- MIDDLE SILT TILL
- NOT SAMPLED

FILE: Q:\PROJECTS\6095746\XSECT\C1TP.DWG

FIGURE 5.4-3

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5.4.7 Soil Screening Results

VOCs were reported in 6 of the original 36 samples collected from the direct push sampling locations. Reported concentrations ranged up to 379 µg/kg of TCE in the duplicated collected from BP3 in the 3.5 to 4 ft bgs interval. The reported concentration of TCE exceeded 1/10th of the NY State comparison criteria. In addition, the benzene concentrations reported in the sample collected from BP4 (4.5 ft bgs) exceeded the comparison criteria.

PAHs were reported in each sample, with the highest concentration of 18,486 µg/kg reported at 3.5 to 4 ft bgs in location A100. Samples collected from locations A200, B0, B100, B200, BP1, C0, C100, and C200 reported PAHs exceeding 1/10th of the NY State comparison criteria.

TNT was not reported in the soil sample screening.

PCBs were reported in concentrations exceeding 1/10th of the NY State comparison criteria in the sample collected from C0 (1.5 ft bgs). The reported PCB is not likely associated with the trash pit.

5.4.8 Laboratory Analyses and Confirmatory Soil Sample Results

Due to the reported presence of elevated PAHs in A100 at 3.5 to 4 ft and elevated VOCs in BP3 at 3.5 to 4 ft, these locations were re-sampled, re-screened, and submitted for full suite confirmatory laboratory analysis.

Re-screening Results

The PAH concentration reported in the sample recollected from A100 at 3.5 to 4 ft exhibited similar PAH concentration as the original sample.

The VOC screening results for the re-sample collected from BP3 reported benzene at a concentration of 394 µg/kg, which was not reported in the original sample. In addition, the concentrations of PCE and TCE were substantially lower than those reported in the original sample. The reported concentration of benzene exceeded the NY State comparison criteria.

Laboratory Results

Other than acetone, which was reported in the associated blank, VOCs were not reported in the sample from A100. The SVOC, hexachlorobenzene, exceeded the NY State comparison criteria. PAHs were reported in the sample from A100 at 3.5 to 4 ft bgs in concentrations that did not exceed the soil screening criteria. However, the concentrations of benzo[a]pyrene and dibenz[a,h]anthracene exceeded 1/10th of the NY State comparison criteria. The reported concentration of heptachlor epoxide exceeded 1/10th of the comparison criteria as well. The reported concentrations of antimony, iron, zinc, and mercury exceeded the comparison criteria in the sample collected from A100. Several additional metals exceeded 1/10th of the NY State comparison criteria. However, laboratory quality control samples for copper, nickel, and zinc were not within control limits.

VOCs were reported in the sample collected from BP3 at 3.5 to 4 ft bgs. The concentrations of the majority of VOCs reported in the screening results were below the reporting limits for the laboratory results and therefore, were not expected in the laboratory data. The exception was benzene, which was reported in the screening results but not the laboratory results. Estimated concentrations of 1,2-dichloroethane, acetone, and methylene chloride reported in the laboratory data exceeded the NY State comparison criteria. However, acetone was also reported in the associated blank. TCE was reported in concentrations exceeding 1/10th of the comparison criteria in the sample collected from location BP3. Concentrations of SVOCs and PAHs were reported in concentrations that did not exceed 1/10th of the comparison criteria. The concentrations of PCB and heptachlor epoxide exceeded 1/10th of the NY State comparison criteria. The reported concentrations of antimony, iron, and mercury exceeded the NY State comparison criteria in the sample collected from BP3. Additional metals exceeded 1/10th of the criteria.

Cyanide and explosives were not reported in the direct push samples submitted to the laboratory.

5.4.9 Ground-Water Sampling Program and Results

Due to the reported concentrations of VOCs in soil collected from BP3, a 2-in. diameter temporary ground-water sampling point was installed at this location. A 10-ft screen interval was placed from 4-ft to 14-ft bgs. A ground-water sample was collected and analyzed for TCL VOCs, SVOCs, PAH, PCP, pesticides, PCB, and explosives. The sampling point did not produce enough water to allow collection for full suite analysis.

VOCs, SVOCs, and pesticides, were reported in concentrations that exceeded the NY State ground-water comparison criteria (Table 5.4-4). PAHs and explosives were reported in concentrations exceeding 1/10th of the comparison criteria.

5.4.10 Conclusions and Recommendations

The results indicate that disposal activities have impacted the subsurface soil, particularly in the 3- to 6- ft interval bgs, and shallow ground water in the area of the trash pit. The elevated boron and lithium concentrations indicate that potential COPC reported in this location are the result of DOD disposal activities associated with AFP-68 or the Navy IPPP. With the exception of metals concentrations reported in A100, BP3 and TP3s, generally, the metals concentrations reported in the soil samples collected from around the perimeter of the trash pit appear to be indicative of site-specific background concentrations. However, a background metals concentration evaluation is recommended to more completely evaluate the reported metals concentrations.

Reported concentrations of explosives suggest a minor impact from former DOD-LOOW activities. Results from the soil and ground-water sampling during this Phase I RI reported similar constituents as the results of sampling of the contents of the trash pit performed by CWM during construction of the LHCU line.

The discontinuous nature of the ground water in this area and the low permeability of the shallow aquifer suggests that extensive migration of COPC within the ground water beyond the extent of the trash pit is unlikely, but this should be confirmed.

It is recommended that the impacted soil and trash be removed, and confirmatory sampling be performed. In addition, it is recommended that the extent of impact to ground water be further evaluated.

In addition, it is recommended that the reported PAH in the vicinity of B0, B200, C0 and C100, and elevated PCB in the vicinity of C0, be further investigated.

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Table 5.4-3 Component 1, Trash Pit, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-TP-SO-A100-4-REP	C1-TP-SO-BP3-4-REP	C1-TP-SO-TP1S-10-10-REP	C1-TP-SO-TP3S-53-6-REP	C1-TP-SO-TP3S-53-7-REP	C1-TP-SO-TP4-20-2-REP	C1-TP-SO-TP7N-40-3-REP
E160.3	PERCENT MOISTURE	%			6.2	11.8	8.3	9.6	9.1	1.6	11.1
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	6020 *	7300 *	10800	8890	12800	5210	7720
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	2.4 N*	0.65 N*	0.49 BN	1.3 N	0.52 BN	0.62 N	0.27 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	4.3	3.9	2.4	1.7	3.4	3.2	6
SW6010	BARIUM	MG/KG	300	NYTAGM	62.6	76.2	104	105	119	47.2	72.8
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.27 B	0.31 B	0.38 B	0.33 B	0.47 B	0.16 B	0.28 B
SW6010	BORON	MG/KG			25.3	8.8 B	5.4 B	14.4	5.5 B	5.3 B	
SW6010	CADMIUM	MG/KG	10	NYTAGM	0.27 BN						
SW6010	CALCIUM	MG/KG			95800	72300	50700	21600	60300	104000	3190
SW6010	CHROMIUM	MG/KG	50	NYTAGM	11.4 *	10.9 *	15.4	13.3	16.8	8.8	11
SW6010	COBALT	MG/KG	30	NYTAGM	4.6 B	6.3	9.3	6.5	10.1	4.1 B	5.2 B
SW6010	COPPER	MG/KG	50	NYTAGM-BG	38.3 N	20.7 N	28	34.3	29	18.3	15.6
SW6010	IRON	MG/KG	2000	NYTAGM	18700	17700	24800	19200	27200	13100	18700
SW6010	LEAD	MG/KG	400	NYTAGM	32 *	12 *	5.6 *	15.8 *	6.4 *	27.4 *	34.3 *
SW6010	LITHIUM	MG/KG			21.5 *	14.2 *	24.2	52.4	25	11.1	9.7
SW6010	MAGNESIUM	MG/KG			43800	25300	9950	5250	9970	39800	2040
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	755	1090	694	571	685	563	913
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	26.8 *	12.1 *	20.1	15.1	21.4	10.2	11.3
SW6010	POTASSIUM	MG/KG			1170 *	1200 *	2070	1040	1710	1110	818
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG	0.85	0.74	0.97	0.95	1.3	1.5	1.1
SW6010	SILVER	MG/KG	4.9	NYTAGM-BG	1.3		0.51 B	0.79 B	0.83 B	2.5	
SW6010	SODIUM	MG/KG			394	314	216	292	204	260	142
SW6010	VANADIUM	MG/KG	150	NYTAGM	12.9	14.8	20.2 E	18 E	23.2 E	9.3 E	16.5 E
SW6010	ZINC	MG/KG	76	NYTAGM-BG	167 N*	44.6 N*	46 N	58.2 N	49.7 N	92.8 N	46.5 N
SW7471	MERCURY	MG/KG	0.1	NYTAGM	1.1	0.1 B		0.37 B	0.06 B		0.09 B
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG			0.16 B				
SW8081	4,4'-DDD	UG/KG	2900	NYTAGM	3.8			13 P			2.4

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.4-3 Component 1, Trash Pit, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-TP-SO-A100-4-REP	C1-TP-SO-BP3-4-REP	C1-TP-SO-TP1S-10-10-REP	C1-TP-SO-TP3S-53-6-REP	C1-TP-SO-TP3S-53-7-REP	C1-TP-SO-TP4-20-2-REP	C1-TP-SO-TP7N-40-3-REP
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM	3.4 P	0.8		12		0.91	6.6
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM	3.7 P	0.68 P		9.1 P		1.2 P	0.68 P
SW8081	ALDRIN	UG/KG	41	NYTAGM	2.3 P			3.5 P			
SW8081	ALPHA-BHC	UG/KG	110	NYTAGM	0.29 P	0.34 P		11 P		0.34	
SW8081	ALPHA-CHLORDANE	UG/KG	540	NYTAGM		0.62 P		11 P			
SW8081	BETA-BHC	UG/KG	200	NYTAGM	4.4 JP	1.2 JP		8.5 P		0.28 P	
SW8081	DIELDRIN	UG/KG	44	NYTAGM				5.6			
SW8081	ENDOSULFAN I	UG/KG	900	NYTAGM				8 P		0.63	
SW8081	ENDOSULFAN II	UG/KG	900	NYTAGM	5.7 P	2.5 P		250 P			0.86 P
SW8081	ENDOSULFAN SULFATE	UG/KG	1000	NYTAGM	15 P			8.7 P		0.46 P	
SW8081	ENDRIN	UG/KG	100	NYTAGM	4.2 P	0.81 P		25 P			0.92
SW8081	ENDRIN ALDEHYDE	UG/KG			4.4 P	2				6.2	
SW8081	ENDRIN KETONE	UG/KG						14 P		2.6 P	
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	2.3 P	0.26 P					
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM	4.9 P	2.3 P		16 P		2.8 P	1.1 P
SW8081	METHOXYCHLOR	UG/KG						4 P			2 P
SW8082	AROCLOR 1242	UG/KG	1000	NYTAGM		110 P		3400			
SW8082	AROCLOR 1260	UG/KG	1000	NYTAGM				540		58 P	
SW8151	PENTACHLOROPHENOL	UG/KG	1000	NYTAGM	53			120			
SW8260B	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM				420			
SW8260B	1,1,2,2-TETRACHLOROET	UG/KG	600	NYTAGM				110 J			
SW8260B	1,1,2-TRICHLOROETHANE	UG/KG				600		4800			
SW8260B	1,2-DICHLOROETHANE	UG/KG	100	NYTAGM		720		5800	2000		
SW8260B	1,2-DICHLOROETHENE, T	UG/KG						490	270		
SW8260B	ACETONE	UG/KG	200	NYTAGM	750 JB	800 JB					
SW8260B	CHLOROBENZENE	UG/KG	1700	NYTAGM				750			
SW8260B	CHLOROFORM	UG/KG	300	NYTAGM				280			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = nr alyzed
blank = tected

Table 5.4-3 Component 1, Trash Pit, Summary of Detected Analytes in Soil
(Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-TP-SO-A100-4-REP	C1-TP-SO-BP3-4-REP	C1-TP-SO-TP1S-10-10-REP	C1-TP-SO-TP3S-53-6-REP	C1-TP-SO-TP3S-53-7-REP	C1-TP-SO-TP4-20-2-REP	C1-TP-SO-TP7N-40-3-REP
SW8260B	ETHYLBENZENE	UG/KG	5500	NYTAGM				180 J			
SW8260B	METHYLENE CHLORIDE	UG/KG	100	NYTAGM		160 J		180 J			
SW8260B	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				1800			
SW8260B	TOLUENE	UG/KG	1500	NYTAGM				910			
SW8260B	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		120 J		4200	250		
SW8260B	XYLENES, TOTAL	UG/KG	1200	NYTAGM				800			
SW8270C	1,2,4-TRICHLOROBENZEN	UG/KG	3400	NYTAGM				410			
SW8270C	1,2-DICHLOROBENZENE	UG/KG	7970	NYTAGM		140		26000			
SW8270C	1,4-DICHLOROBENZENE	UG/KG	8500	NYTAGM				5700			
SW8270C	BIS(2-ETHYLHEXYL) PHT	UG/KG	50000	NYTAGM	1600	540		2100			
SW8270C	HEXACHLOROBENZENE	UG/KG	410	NYTAGM	460			270			
SW8270C	M-DICHLOROBENZENE	UG/KG	1600	NYTAGM				790			
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM	40			22		13	59
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM	9.4						1.9
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM	10			6.9		1.7	8.9
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM	12			7.6		2.7	15
SW8310	BENZO[B]FLUORANTHEN	UG/KG	224	NYTAGM	15	6.2		12	1.4	7.3	25
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	27	4.1		14	1.6	6	17
SW8310	BENZO[K]FLUORANTHEN	UG/KG	224	NYTAGM	5.1	1.1		4.2		2.4	8.3
SW8310	CHRYSENE	UG/KG	400	NYTAGM		1.7		2.1	1.3	3.2	17
SW8310	DIBENZ[A,H]ANTHRACEN	UG/KG	14	NYTAGM	1.9						2.7
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	47	5.9		30		11	31
SW8310	FLUORENE	UG/KG	50000	NYTAGM	4.2			13			
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM	8.1			3.4		2.6	7.3
SW8310	NAPHTHALENE	UG/KG	13000	NYTAGM		15		150			
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	70	11		44	0.83	12	20
SW8310	PYRENE	UG/KG	50000	NYTAGM	35	3.4		14		5.8	24

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 5.4-4 Component 1, Trash Pit, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-TP-GW-BP3
SW8081	ALPHA-BHC	N	UG/L	0	NYSTANDARD	0.06 P
SW8081	ENDOSULFAN II	N	UG/L			0.57 P
SW8081	ENDRIN	N	UG/L	0	NYSTANDARD	0.02 P
SW8081	GAMMA-BHC	N	UG/L	0	NYSTANDARD	0.01 P
SW8260B	1,1,1-TRICHLOROETHANE	N	UG/L	5	NYSTANDARD	72
SW8260B	1,1,2,2-TETRACHLOROETHANE	N	UG/L	5	NYSTANDARD	17
SW8260B	1,1,2-TRICHLOROETHANE	N	UG/L	5	NYSTANDARD	740 D
SW8260B	1,1-DICHLOROETHYLENE	N	UG/L	5	NYSTANDARD	20
SW8260B	1,2-DICHLOROETHANE	N	UG/L	5	NYSTANDARD	690 D
SW8260B	1,2-DICHLOROETHENE, TOTAL	N	UG/L	5	NYSTANDARD	12
SW8260B	2-BUTANONE	N	UG/L	50	NYGUIDANCE	3 J
SW8260B	ACETONE	N	UG/L	50	NYGUIDANCE	34
SW8260B	BENZENE	N	UG/L	0.7	NYSTANDARD	5
SW8260B	CHLOROBENZENE	N	UG/L	5	NYSTANDARD	41
SW8260B	CHLOROFORM	N	UG/L	7	NYSTANDARD	25
SW8260B	ETHYLBENZENE	N	UG/L	5	NYSTANDARD	14
SW8260B	METHYLENE CHLORIDE	N	UG/L	5	NYSTANDARD	26
SW8260B	O-XYLENE	N	UG/L	5	NYSTANDARD	49
SW8260B	TETRACHLOROETHENE	N	UG/L	5	NYSTANDARD	71
SW8260B	TOLUENE	N	UG/L	5	NYSTANDARD	54
SW8260B	TRICHLOROETHYLENE	N	UG/L	5	NYSTANDARD	400 D
SW8260B	VINYL CHLORIDE	N	UG/L	5	NYSTANDARD	16
SW8270C	1,2-DICHLOROBENZENE	N	UG/L	4.7	NYSTANDARD	110
SW8270C	1,4-DICHLOROBENZENE	N	UG/L	4.7	NYSTANDARD	21
SW8270C	4-CHLORO-3-METHYLPHENOL	N	UG/L			6
SW8310	NAPHTHALENE	N	UG/L	10	NYGUIDANCE	3.6
SW8310	PHENANTHRENE	N	UG/L	50	NYSTANDARD	0.01
SW8330	RDX	N	UG/L	3.2	NYGUIDANCE	1.2

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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5.5 PROPERTY G DRUM AREA

5.5.1 Site Background

The Property G drum area is located in the southwestern corner of CWM property, adjacent to and west of CWM Facultative Ponds 1 and 2. During a remedial action in 1986 initiated by the US Department of Energy under the Formerly Used Sites Remedial Action Program (FUSRAP), buried drums containing a tar-like substance as well as associated visually contaminated soil were excavated and removed from the area. The approximate location of the excavation area is shown on Figure 5.5-1. In addition, review of available aerial photographs from 1951 and 1960 indicates areas of ground scarring, possibly due to disposal or excavation activities, located within the vicinity of Property G.

Currently, the north central portion of the Property G grid is used as a soil stockpile area by CWM. The soil pile covers approximately 2 acres and stands approximately 20 ft high.

5.5.2 Field Reconnaissance and Surface Features

Most of this area is heavily wooded, with the exception of the disturbed areas of the soil pile (the CWM stockpile) and the former drum area southeast of the soil pile (Figure 5.5-1). A dilapidated farmhouse, built prior to the construction of LOOW, is located just south of the Property G area of investigation. A well associated with the building was also located approximately 25 ft north of the northeast corner of the structure. In addition, a pit and small building structure associated with the pit was located adjacent to and west of Campbell Street, within the area of investigation. This pit is in the location of a former water meter pit (Krehbiel 1985). Three valves could be seen within the pit. These are most likely associated with the former LOOW water lines. A former LOOW manhole was located west of Campbell Street, in the vicinity of sampling grid location C200. This manhole is presumably associated with the former LOOW acid waste sewer, but may be associated with the former LOOW sanitary sewer. A second former LOOW acid waste manhole was located adjacent to a dirt access road south of the area of

Photograph 5.5-1 Photograph showing surface features of Property G after site clearance.

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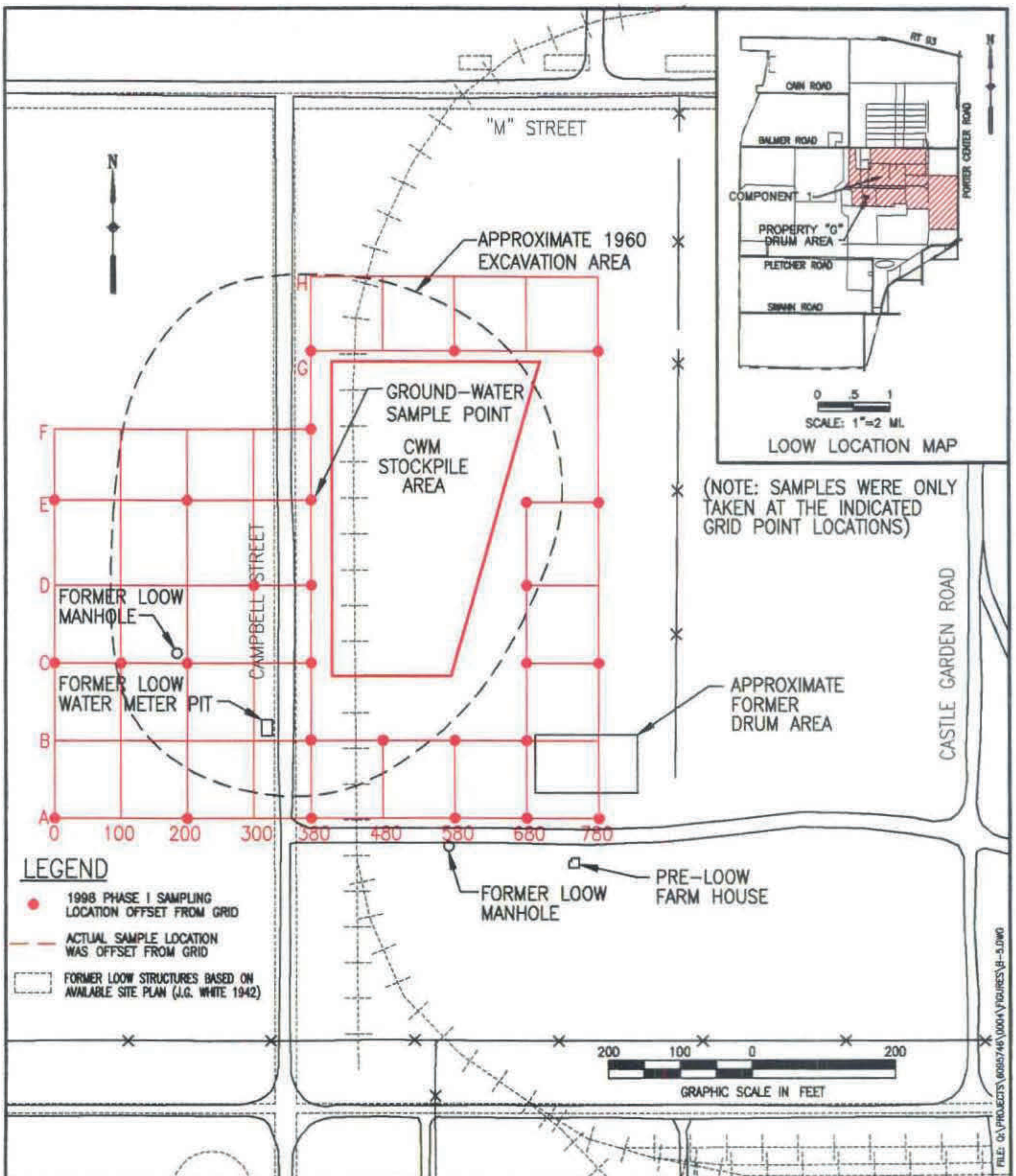

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

COMPONENT 1 (CWM)
EXISTING PROPERTY "G" DRUM AREA
AND AREA OF 1960 EXCAVATION
SAMPLING GRID LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	BCR	FDV	SMS	AS SHOWN	JULY 1999	60957.46	5.5-1

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investigation and northwest of the old farmhouse. The results from the sampling of these manholes are discussed in Chapter 11.

Overall, the area surrounding the Property G grid is generally flat. Due to the soil stockpiling and previous excavations, there is some topographic relief in the center of the site. Vertical survey data was not collected during the RI; consequently there is no benchmark from which to standardize the boring depths. Borings were not drilled directly on the soil pile, but some borings (the 380 row) were performed on the perimeter, approximately 1to 2 ft above the surface elevations of the surrounding borings.

5.5.3 Soil Sampling Program

During the Phase I RI, field activities at the Property G drum area included collection of surface soil, subsurface soil, and ground-water samples. The ground-water sampling program is discussed in Section 5.5.7.

A sampling grid, with approximately 100-ft intervals between sampling points, was established across the site, however samples were generally collected from every other grid point. Figure 5.5-1 shows locations sampled at the Property G grid. Grid points were given alphanumeric designations, with A0 being the southwestern origin of the grid. Row 400 was shifted to the west, to 380 ft from the origin, to avoid placing sampling locations in the CWM soil stockpile. The remaining rows, through 800 were also shifted to the west.

Direct-push technology was used to perform sampling at grid locations. Surface soil samples, ranging in depth from 0 to 0.5 ft bgs, and subsurface soil samples, ranging in depth from 12 to 16 ft bgs, were collected from each location. Soil samples were field screened for VOCs, PAHs, PCB, and TNT.

Soil field-screening results were reviewed to designate locations for collection of laboratory confirmatory samples. Those screening locations exhibiting the highest level of elevated concentrations of COPC were revisited. Samples were collected, screened, and submitted for confirmatory laboratory analysis as discussed in Sections 5.5.5 and 5.5.6.

5.5.4 Site Stratigraphy

Surface Soil

Surface soil samples collected from the Property G area were generally classified as silt, clayey silt, or silty clay. Soil samples were generally dry, with higher moisture and organic content in wooded areas. Most of the surface samples can be classified as UCT. Surface samples have generally been disturbed, due to the excavation activities in the 1950's and 1980's, and the current stockpiling of soils by CWM.

Subsurface Stratigraphy

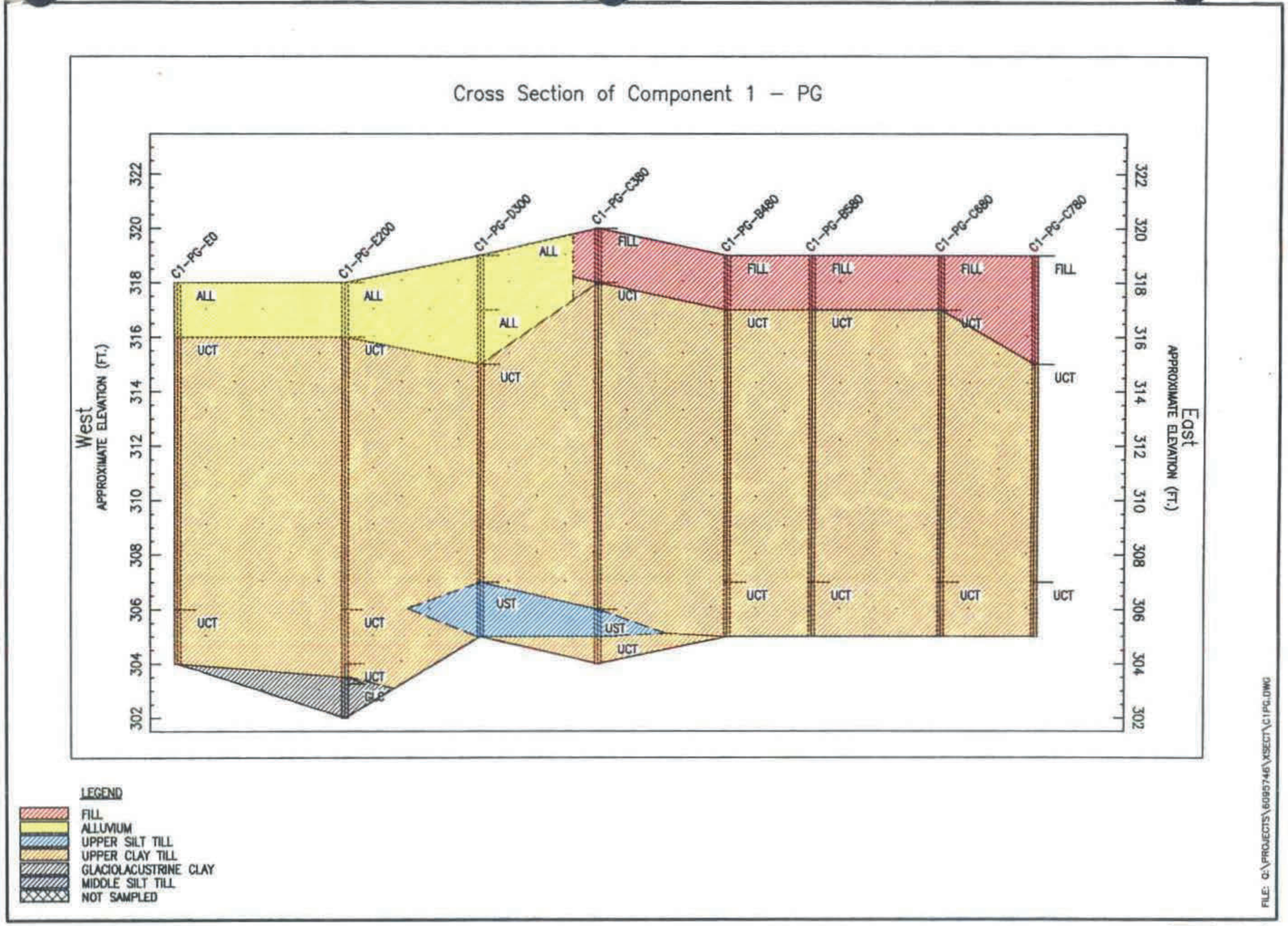
A wet to saturated silt and/or sand layer (SM/ML) was reported across much of the site, particularly in the central and southwestern sections. At the southwest corner (A0, C0, and A200), a saturated SM/ML layer (UST) was reported in contact with an underlying UCT at 13-ft bgs. Toward the center of the grid (C380 and E380), the SM/ML layer was encountered at 14-ft to 16-ft bgs, with a transition at 15-ft into a tighter silt (Figure 5.5-2). The wet SM/ML layer was underlain by UCT in G380, and overlain by UCT in E380.

On the eastern half of the grid, sand was not reported. Wet, stiff silt (ML) was reported in several borings approximately 12-ft to 13-ft bgs. GLC was reported in 2 borings on the A row (A380 and A580) approximately 14-ft bgs. The saturated sand lens in the west appears to pinch out to the east. The silt appears to taper out to thin lenses near the bottom of the UCT, or between the UCT and GLC.

5.5.5 Soil Screening Results

Soil screening results for Property G can be found in Table 5.5-1. Analytes that exceed soil screening criteria have been shaded.

VOCs were reported in 4 of the 58 samples collected within the sampling grid. The highest concentration of VOCs, 6.70 µg/kg of 1,1-DCE, was reported in location C380 at 14 to 14.5 ft bgs. The reported VOC concentrations did not exceed 1/10th of the NY State comparison criteria.



Cross Section of Component 1 – PG
West
APPROXIMATE ELEVATION (FT.)
East
APPROXIMATE ELEVATION (FT.)
322
320
318
316
314
312
310
308
306
304
302
C1-PG-E0
C1-PG-E200
C1-PG-D300
C1-PG-C380
C1-PG-B480
C1-PG-B580
C1-PG-C680
C1-PG-C780
ALL
FILL
UCT
UST
GLC
LEGEND
FILL
ALLUVIUM
UPPER SILT TILL
UPPER CLAY TILL
GLACIOLACUSTRINE CLAY
MIDDLE SILT TILL
NOT SAMPLED
FILE: Q:\PROJECTS\6095746\XSECT\C1PG.DWG

FIGURE 5.5-2

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PAHs were reported in each soil sample submitted for screening. However, the reported total PAH concentration did not exceed the NY State comparison criteria of 10,000 µg/kg for total carcinogenic SVOCs. However, concentrations of total PAHs exceeded 1/10th of the criteria in several of the samples.

TNT and PCB were not reported in the field-screening samples.

5.5.6 Laboratory Analyses and Confirmatory Soil Sample Results

Due to the reported presence of potential COPC in the sample collected from C780 (14 ft bgs), this location was revisited. In addition, A780 (surface sample) was revisited and re-sampled due to its location within the presumed former drum area. Location E380 (subsurface) was revisited due to its likelihood of producing ground water. Additional soil samples were collected, screened, and submitted for confirmatory laboratory analysis of full suite parameter. Sample depths for those samples selected for laboratory analysis may have varied slightly from the depth of the original sample.

Soil screening results for confirmatory samples at Property G can be found in Table 5.5-1. Laboratory analytical sample results for confirmatory samples at Property G can be found in Table 5.5-2. Analytes that exceed 1/10th of the NY State comparison criteria have been lightly shaded. Analytes exceeding the full value of the criteria have been darkly shaded.

Re-screening Results

The PAH concentration in the re-collected samples from A780, C780, and E380 did not exceed 1/10th of the NY State comparison criteria, as the original sample from that location had. VOCs, PCB, and TNT were not reported.

Laboratory Results

SVOCs, pesticides and PCB were reported in concentrations that did not exceed the New York State comparison criteria in the sample collected from A780. PAHs exceeded 1/10th of the comparison criteria in the sample collected from A780. The sample collected from E380 reported a phthalate in concentrations that did not exceed 1/10th of the NY State comparison criteria. PAHs were not reported in the samples collected from C780 or E380. VOCs, explosives, and cyanide were not reported in the laboratory analytical results for soil samples collected from Property G.

Antimony, iron, zinc and mercury exceeded the NY State comparison criteria in the sample collected from A780. Iron exceeded the comparison criteria in the sample collected from C780. Both antimony and iron were reported in concentrations exceeding the comparison criteria in the sample collected from E380. Additional metals exceeded 1/10th of the comparison criteria.

5.5.7 Ground-Water Sampling Program and Results

Due to the presence and concentration of COPC in field screening and the stratigraphy indicating the presence of a water-bearing zone, a 1-in. temporary ground-water sampling point was installed at location E380. The screening interval was placed between 11 and 16 ft bgs and included a lens of saturated fine sand. A ground-water sample was collected and submitted for laboratory analysis of VOCs and SVOCs (Table 5.5-3). Ground-water production was insufficient for analysis of the full suite of parameters.

The VOCs 2-butanone, acetone, and TCE were reported in concentrations that exceeded 1/10th of the NY State comparison criteria. SVOCs were not reported in the ground-water sample collected from E380.

5.5.8 Conclusions and Recommendations

With the exception of elevated PAHs, there appears to be minimal impact to the soil within the former area of ground scarring in Property G. Additionally, very little ground water appears to be available within the Property G area. With the exception of the reported mercury in the sample collected from A780, the metals concentrations reported in the soil samples collected from within this area appear to be indicative of site-specific background concentrations. However, a background metals concentration evaluation is recommended to more completely evaluate the reported metals concentrations.

Because the exact location of the drum disposal area was not available until after the field investigation of Property G, it is recommended that further investigation, confined to the drum removal area, be performed. Because the drums were discovered near the surface, additional investigations should target a shallower interval, between 4 and 10 ft bgs. In addition, the possible impact to ground water, if ground water is present, should be evaluated in the former drum area. The elevated mercury reported in the vicinity of the former drum burial area is recommended for further investigation. Because this area was a former AEC disposal area, it is further recommended that additional investigation be performed under the FUSRAP program.

Further investigation of this area should be considered within the current remedial investigation for the Niagara Falls Storage Site.

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Table 5.5-1 Component 1, Property "G" Drum Area, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-PG-SO-A0-0.0-0.3	C1-PG-SO-A0-0.0-0.3-DUP	C1-PG-SO-A0-12.0-12.5	C1-PG-SO-A200-0.0-0.5	C1-PG-SO-A200-12.0-12.5	C1-PG-SO-A380-0.0-0.5	C1-PG-SO-A380-15.5-16.0	C1-PG-SO-A580-0.0-0.5	C1-PG-SO-A580-15.5-16.0	C1-PG-SO-A580-15.5-16.0-DUP	C1-PG-SO-A680-0.0-0.5	C1-PG-SO-A680-0.0-0.5-DUP	C1-PG-SO-A680-13.5-14.0	C1-PG-SO-A680-13.5-14.0-DUP
E4035	PAH	UG/KG	10000	NYTAGM	2808	NA	403	3233	876	1569	1561	491	1242	NA	3457	3523	253	NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM												NA		
GC	BENZENE	UG/KG	60	NYTAGM												NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM												NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM												NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM												NA		
GC	TOLUENE	UG/KG	1500	NYTAGM												NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM												NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.5-1 Component 1, Property "G" Drum Area, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-PG-SO-A0-0.0-0.3	C1-PG-SO-A780-0.0-0.5	C1-PG-SO-A780-0.0-0.5-DUP	C1-PG-SO-A780-1-REP	C1-PG-SO-A780-13.5-14.0	C1-PG-SO-B380-0.0-0.5	C1-PG-SO-B380-13.5-14.0	C1-PG-SO-B480-0.0-0.5	C1-PG-SO-B480-13.5-14.0	C1-PG-SO-B580-0.0-0.5	C1-PG-SO-B580-13.5-14.0	C1-PG-SO-B580-13.5-14.0-DUP	C1-PG-SO-B680-0.0-0.5	C1-PG-SO-B680-13.5-14.0
E4035	PAH	UG/KG	10000	NYTAGM	2808	1983	2368	356	1005	586	192	2509	202	1472	213	208	279	579
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM			NA									NA		
GC	BENZENE	UG/KG	60	NYTAGM			NA									NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM			NA									NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		1.42	NA									NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM		1.44	NA									NA		
GC	TOLUENE	UG/KG	1500	NYTAGM		0.76	NA									NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			NA									NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.5-1 Component 1, Property "G" Drum Area, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-PG-SO-A0-0.0-0.3	C1-PG-SO-C0-0.3-0.8	C1-PG-SO-C0-12.5-13.0	C1-PG-SO-C0-12.5-13.0-DUP	C1-PG-SO-C100-0.0-0.4	C1-PG-SO-C100-12.7-13.2	C1-PG-SO-C200-0.0-0.5	C1-PG-SO-C200-13.5-14.0	C1-PG-SO-C380-0.0-0.5	C1-PG-SO-C380-0.0-0.5-DUP	C1-PG-SO-C380-14.0-14.5	C1-PG-SO-C680-0.0-0.5	C1-PG-SO-C680-13.5-14.0	C1-PG-SO-C680-13.5-14.0-DUP
E4035	PAH	UG/KG	10000	NYTAGM	2808	470	175	NA	664	206	493	643	776	NA	948	919	259	NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM											6.7			
GC	BENZENE	UG/KG	60	NYTAGM											1.25			
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM											0.66			
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM														
GC	M & P-XYLENES	UG/KG	1200	NYTAGM														
GC	TOLUENE	UG/KG	1500	NYTAGM														
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM											0.5			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.5-1 Component 1, Property "G" Drum Area, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-PG-SO-A0-0.0-0.3	C1-PG-SO-C780-0.0-0.5	C1-PG-SO-C780-13.5-14.0	C1-PG-SO-C780-14-REP	C1-PG-SO-C780-14.0-DUP	C1-PG-SO-D300-0.0-0.5	C1-PG-SO-D300-13.5-14.0	C1-PG-SO-D300-3.5-4.0	C1-PG-SO-D380-0.0-0.5	C1-PG-SO-D380-0.0-0.5-DUP	C1-PG-SO-D380-13.5-14.0	C1-PG-SO-D680-0.0-0.5	C1-PG-SO-D680-0.0-0.5-DUP	C1-PG-SO-D680-13.5-14.0	C1-PG-SO-D680-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	2808	385	1035	315	266	904	447	369	403	571	882	1761	NA	462	1589
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA					NA			NA		
GC	BENZENE	UG/KG	60	NYTAGM					NA					NA			NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA					NA			NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM					NA					NA			NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM					NA					NA			NA		
GC	TOLUENE	UG/KG	1500	NYTAGM			1.11		NA					NA			NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM					NA					NA			NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = nc' alyzed
blank = tected

Table 5.5-1 Component 1, Property "G" Drum Area, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-PG-SO-A0-0.0-0.3	C1-PG-SO-E0-0.0-0.5	C1-PG-SO-E0-13.5-14.0	C1-PG-SO-E200-0.0-0.5	C1-PG-SO-E200-0.0-0.5-DUP	C1-PG-SO-E200-15.5-16.0	C1-PG-SO-E380-0.0-0.5	C1-PG-SO-E380-14.0-14.6	C1-PG-SO-E380-14.1-14.6	C1-PG-SO-E380-14.1-14.6-DUP	C1-PG-SO-E380-16-REP	C1-PG-SO-E680-0.0-0.5	C1-PG-SO-E680-15.5-16.0	C1-PG-SO-E780-0.0-0.5	C1-PG-SO-E780-13.5-14.0
E4035	PAH	UG/KG	10000	NYTAGM	2808	1015	351	888	1144	750	4046	1140	NA	NA	177	488	250	842	431
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA			NA							
GC	BENZENE	UG/KG	60	NYTAGM					NA			NA							
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA			NA							
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM					NA			NA							
GC	M & P-XYLENES	UG/KG	1200	NYTAGM					NA			NA							
GC	TOLUENE	UG/KG	1500	NYTAGM					NA			NA							
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		0.2			NA			NA							

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.5-1 Component 1, Property "G" Drum Area, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-PG-SO-A0-0.0-0.3	C1-PG-SO-F380-0.0-0.5	C1-PG-SO-F380-13.5-14.0	C1-PG-SO-G380-0.0-0.5	C1-PG-SO-G380-0.0-0.5-DUP	C1-PG-SO-G380-12.2-12.7	C1-PG-SO-G580-0.0-0.5	C1-PG-SO-G580-13.5-14.0	C1-PG-SO-G780-0.0-0.5	C1-PG-SO-G780-0.0-0.5-DUP	C1-PG-SO-G780-13.5-14.0
E4035	PAH	UG/KG	10000	NYTAGM	2808	2434	240	488	482	196	1155	376	118	531	389
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA					NA	
GC	BENZENE	UG/KG	60	NYTAGM					NA					NA	
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA					NA	
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM					NA					NA	
GC	M & P-XYLENES	UG/KG	1200	NYTAGM					NA					NA	
GC	TOLUENE	UG/KG	1500	NYTAGM					NA					NA	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM					NA					NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.5-2 Component 1, Property "G" Drum Area, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-PG-SO-A780-1-REP	C1-PG-SO-C780-14-REP	C1-PG-SO-E380-16-REP
E160.3	PERCENT MOISTURE	%			11.4	15.4	18.7
E415.1	TOTAL ORGANIC CARBON	MG/KG			19000	3500	4900
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	10600	13100	15900
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.95 N	0.47 BN	0.62 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	3.2	2	3.7
SW6010	BARIUM	MG/KG	300	NYTAGM	84.3	139	71
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.47 B	0.47 B	0.65
SW6010	BORON	MG/KG			4.6 B	9.6 B	10.7 BN
SW6010	CADMIUM	MG/KG	10	NYTAGM		0.07	
SW6010	CALCIUM	MG/KG			10700 B*	49700 *	66400 *
SW6010	CHROMIUM	MG/KG	50	NYTAGM	14.9	18.1	21.6
SW6010	COBALT	MG/KG	30	NYTAGM	6.4	8.3	12.8
SW6010	COPPER	MG/KG	50	NYTAGM-BG	26.6	26	29.5
SW6010	IRON	MG/KG	2000	NYTAGM	25700	26600	34300
SW6010	LEAD	MG/KG	400	NYTAGM	51.6	5.6	7.5
SW6010	LITHIUM	MG/KG			16.3	27.3	34.8
SW6010	MAGNESIUM	MG/KG			4340	10500	12400
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	435	591	770
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	14.3	21.3	27.1
SW6010	POTASSIUM	MG/KG			872	2620	2620
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG		0.22	
SW6010	SILVER	MG/KG	4.9	NYTAGM-BG		0.11	
SW6010	SODIUM	MG/KG			176	239	281
SW6010	VANADIUM	MG/KG	150	NYTAGM	22	24.3	29
SW6010	ZINC	MG/KG	76	NYTAGM-BG	91.2	49.4	61.4
SW7471	MERCURY	MG/KG	0.1	NYTAGM	0.15 B		
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG	0.16 B	0.13 B	0.18 B

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

Table 5.5-2 Component 1, Property "G" Drum Area, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-PG-SO-A780-1-REP	C1-PG-SO-C780-14-REP	C1-PG-SO-E380-16-REP
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM	1.5 P		
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM	1.1 P		
SW8081	ALDRIN	UG/KG	41	NYTAGM	0.21 P		
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM	0.35 P		
SW8082	AROCLOR 1260	UG/KG	1000	NYTAGM	16		
SW8270C	BIS(2-ETHYLHEXYL) PHTHAL	UG/KG	50000	NYTAGM	240		220
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM	20		
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM	1.8		
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM	6.3		
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM	14		
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	27		
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	21		
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	9.3		
SW8310	CHRYSENE	UG/KG	400	NYTAGM	9.9		
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM	2.1		
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	14		
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM	9.2		
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	5		
SW8310	PYRENE	UG/KG	50000	NYTAGM	14		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = no' ·-alyzed
blank = ·tected

Table 5.5-3 Component 1, Property "G" Drum Area, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-PG-GW-E380
SW8260B	2-BUTANONE	N	UG/L	50	NYGUIDANCE	17
SW8260B	ACETONE	N	UG/L	50	NYGUIDANCE	25
SW8260B	TRICHLOROETHYLENE	N	UG/L	5	NYSTANDARD	0.6

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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5.6 FORMER AFP-68 PROCESS AREAS

AFP-68 was a former high-energy fuels (HEF) plant operated by Olin in the 1950s. The plant was comprised of several distinct process areas. As discussed in the Work Plan, the investigation of AFP-68 on CWM property was consolidated into two main areas, representing the process areas located east and west of Wesson Street.

5.6.1 Process Areas East of Wesson Street

Former AFP-68 Process Areas located east of Wesson Street include Process Areas 2, 4, 7, 8, 11, and 20. The History Search Report and Work Plan contain detailed information on the processes at the former AFP-68. Summary descriptions are included in this section.

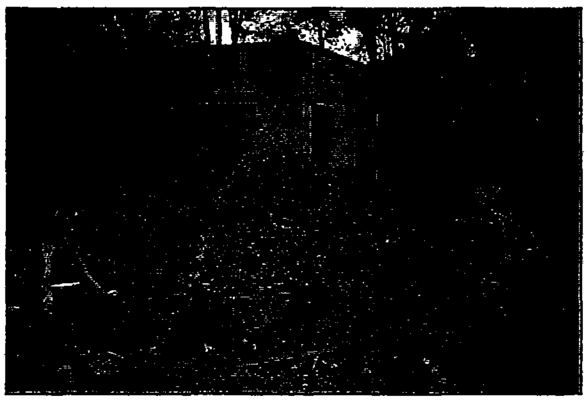
5.6.1.1 Site Background

<u>Process Area 2</u>

Process Area 2 consists of an existing control building, a tank farm, a central process area, and the remains of three chimney-type stacks. This area was used for the synthesis, recovery, purification, and storage of boron trichloride.

<u>Process Area 4</u>

Process Area 4 consists of an existing control building with an electrical substation, a collapsed wooden structure, a chemical waste lift station, and AST cradles (Photograph 5.6-1). The area was used for the synthesis, purification, and storage of diborane. Underground lines from this lift station continued to the oil/water separator in Process Area 24.



Photograph 5.6-1. Photograph looking east towards Building 4-01.

<u>Process Area 7</u>

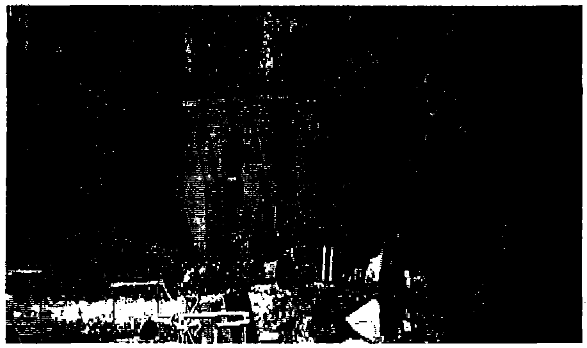
Process Area 7 consists of an existing control building, an east and west process area, and a tank containment area (Photograph 5.6-2). Pyrolysis of diborane occurred at Process Area 7. A

Photograph 5.6-2. Photograph looking south at north side of Building 7-01.

chemical waste lift station is located west of the area. In addition, the former wash house for TNT line 6 was located near the eastern portion of this area. Underground lines carried the runoff and waste from AFP-68 to the oil/water separator in Area 24. The former LOOW TNT waste transfer line trends east-west across the northern portion of Process Area 7.

Process Area 8

Process Area 8 (Photograph 5.6-3) consists of an existing control building, a collapsed wooden structure, a 20-ft high, L-shaped concrete explosion wall, a central process area, a tank farm, and a chemical waste lift station to the west of the area (Acres 1988). The area was used to alkylate boranes that were produced in Process Area 7. In addition, the former bitri-nitration house for TNT line 6 was located in the southern portion of this area. Underground lines carried the runoff and waste to the oil/water separator in Area 24.



Photograph 5.6-3. Photograph looking west at Building 8-01. The former parking area shown in the foreground is currently used as storage.

Process Area 11

Process Area 11 consists of a large pair of concrete tank cradles and was used for the generation, purification, and storage of both liquid and gaseous nitrogen. The process involved the fractional distillation of air using caustic soda and silica gel filters.

Process Area 20

Process Area 20 consists of a former tank farm area, an empty drum/cylinder staging area, and a railroad loading platform (Photograph 5.6-4). The area was used for bulk storage, blending, drumming, and tank car loading of HEF-2 and HEF-3. In addition, the former mononitrating, acid-fume recovery building, and fortifier houses of TNT line 6, as well as associated underground lines, were located in this area.

Photograph 5.6-4. Photograph looking southwest at gravel lot, at north end of loading dock located within Process Area 20.

5.6.1.2 Field Reconnaissance and Surface Features

Thick brush and remnant buildings, tank cradles, and foundations largely characterize the area east of Wesson Street on AFP-68 of Component 1. A large clean soil pile, placed by CWM, is located south of the Process Area 4 building. A black tar-like substance was observed on the surface west of the control building in Process Area 4. With the exception of the soil pile, the area appeared to be as described by Acres (Acres 1988).

B Ditch traverses the area, south of Process Area 4 and north of Process Area 7, flowing to the west. The heavy brush decreases in the vicinity of Process Area 8, but increases again south of Spruce Street, in Process Areas 2 and 20. Railroad tracks are present adjacent to and south of Process Areas 2 and 20. In addition, black soot-like material, first described by Acres in the 1992 Preliminary Contaminant Assessment, was still present in Area 2 in the vicinity of the smokestacks. In Process Area 20, the inaccessible sewage pump described by Acres was discovered to be a displaced lid and was not associated with a subsurface feature. A manhole, previously undiscovered and not sampled, was located in Process Area 2, adjacent to and south of Spruce Street. The contents of this manhole, designated CWM-SS1, and the associated sampling program are further described in Chapter 11.

5.6.1.3 Soil Sampling Program

Field activities at former AFP-68 included collection of surface soil, subsurface soil, ground-water, surface water, sediment, and wastewater samples. The soil sampling program is described herein. The ground-water sampling program is discussed in Section 5.6.1.7. The surface water and sediment sampling program are described in Chapter 13. The wastewater sampling program is describe in Chapter 11.

A soil sampling grid with an approximate 100-ft interval was established across the site encompassing all process areas east of Wesson Street (Figure 5.6-1). Grid points were given

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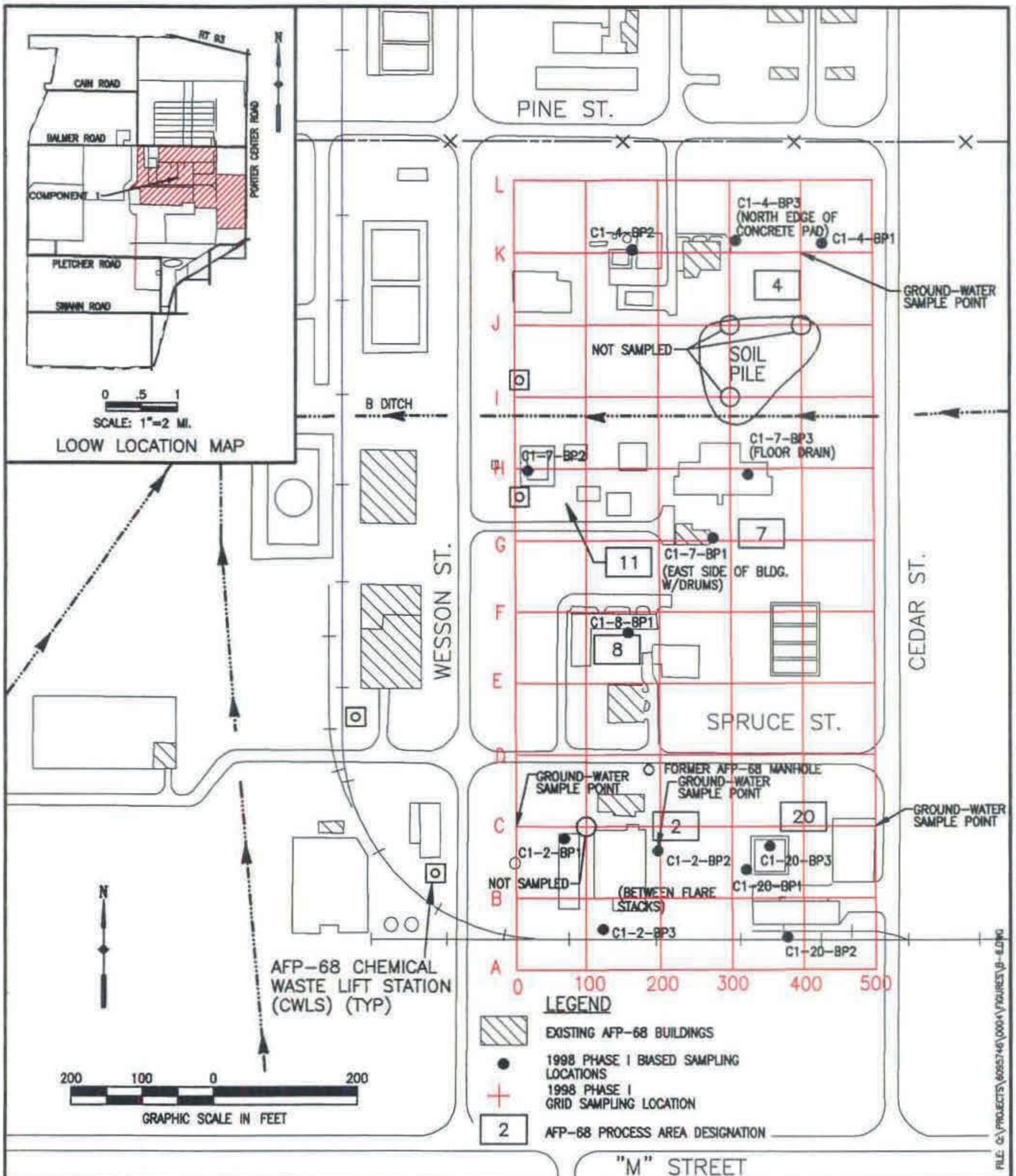

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

COMPONENT 1 (CWM)
PROCESS AREAS 2, 4, 7, 8, 11 AND 20
SAMPLING GRID LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	DLR	FDV	SMS	AS SHOWN	JULY 1999	60957.46	5.6-1

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alpha-numeric designations, with A0 being the southwestern origin of the grid. The grid extended 1,100 ft to row L to the north, and 500 ft to the east, for a total of 72 grid locations.

In addition, 13 biased sampling locations were established within the grid. Table 5.6-1 details the biased point sample locations and rationale behind their placement.

TABLE 5.6-1 BIASED SAMPLING POINT RATIONALE

Biased Sampling Point	Rationale Behind Placement
C1-2-SO-BP1	Located within a former tank farm at Process Area 2.
C1-2-SO-BP2	Located east of the smoke stacks to evaluate impact to the subsurface in the area historically reported to contain elevated COPC in the surface soil (Acres 1992)
C1-2-SO-BP3	Located in the vicinity of the railroad track in Process Area 2.
C1-4-SO-BP1	Located in an area devoid of vegetation.
C1-4-SO-BP2	Located in the vicinity of a former tank farm.
C1-4-SO-BP3	Located at the northeast corner of Building 4-01, in a former transformer area.
C1-7-SO-BP1	Located in the vicinity of 55-gal drums east of the Building 7-01.
C1-7-SO-BP2	Placed in a tank farm historically reported to contain elevated PAHs in the surface soil (Acres 1992).
C1-7-SO-BP3	Placed next to a floor drain in a foundation. [**Note**: *Samples from this location were collected from beneath the foundation.*]
C1-8-SO-BP1	Located in an area historically reported to contain elevated COPC within the surface soil (Acres 1992).
C1-20-SO-BP1	Placed adjacent to an overturned 55-gal drum.
C1-20-SO-BP2	Located in an area between the railroad track and the existing loading dock.
C1-20-SO-BP3	Within the walled tank farm, an area historically reported to contain elevated COPC in surface soils (Acres 1992).

Direct push technology was used to perform sampling at each grid and biased point location. Generally, a surface soil sample (ranging in depth from 0 to 1 ft bgs), a semi-subsurface soil sample (ranging in depth from 2.4 to 5.3 ft bgs), and a subsurface soil sample (ranging in depth from 9.3 to 15.3 ft bgs) was collected from each location. Soil samples were used to describe site stratigraphy and were field screened for VOCs, PAHs, PCB, and TNT. Because grid locations I300, J300, and J400 were located on the CWM soil pile within Process Area 4, these locations were not sampled. In addition, asbestos panels prohibited access to location C100. Due to refusal or lack of recovery, samples were not collected from some intervals at some locations (e.g., B0, F0, G0, H300, J200, and C500).

Soil screening results were evaluated, and locations exhibiting elevated concentrations of constituents of potential concern (COPC) were re-sampled, re-screened, and submitted for confirmatory laboratory analysis as discussed in Sections 5.6.1.5, 5.6.1.6, and 5.6.1.7.

5.6.1.4 Site Stratigraphy

A representative cross-section of the area east of Wesson Street is included as Figure 5.6-2.

Surface Soil

Typical surface samples (0 to 2 ft bgs) consisted of topsoil, clayey silt, or gravel/cobble fill. Surface material was generally dry, with the exception of samples collected in the densely wooded areas in which the upper 0.5 to 1 ft was highly organic and moist. Occasionally, the surface soil was classified as an upper clay till (UCT). UCT was generally encountered 2 to 4 ft bgs, immediately below a silt layer.

Due to past use, it is expected that the surface soil was altered through grading, particularly in the immediate vicinity of buildings (i.e., Areas 7, 8, and 11). Fill material was occasionally encountered, but was not a major component of the subsurface strata. Copies of the boring logs from the Phase I RI are included in Appendix A.

Subsurface Stratigraphy

Subsurface stratigraphy was generally characterized as UCT, with rare laminations or thin lenses (less than 3 in.) of silt, fine sand, and/or gravel. The target unit for the deep subsurface sample was the Upper Silt Till. The silt unit is very discontinuous. In most locations, the Glaciolacustrine Clay layer was encountered directly beneath the UCT from 10 to 16 ft bgs. In general, very little water was reported in subsurface strata.

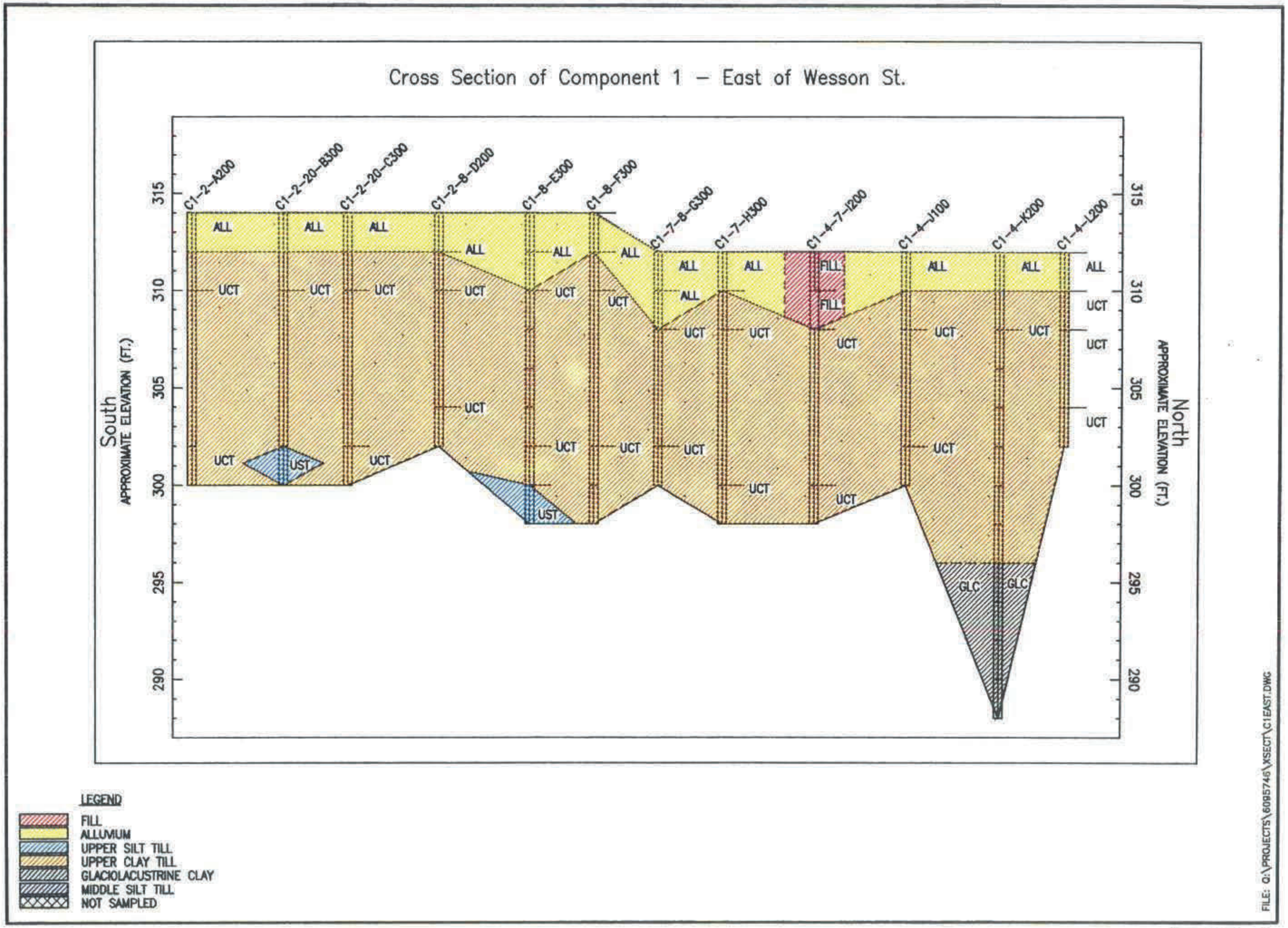
Cross Section of Component 1 – East of Wesson St.
South
North
APPROXIMATE ELEVATION (FT.)
C1-2-A200
C1-2-20-B300
C1-2-20-C300
C1-2-8-D200
C1-8-E300
C1-8-F300
C1-7-8-G300
C1-7-H300
C1-4-7-I200
C1-4-J100
C1-4-K200
C1-4-L200
ALL
UCT
UST
FILL
GLC
315
310
305
300
295
290
LEGEND
FILL
ALLUVIUM
UPPER SILT TILL
UPPER CLAY TILL
GLACIOLACUSTRINE CLAY
MIDDLE SILT TILL
NOT SAMPLED
FILE: Q:\PROJECTS\6095746\XSECT\C1EAST.DWG

FIGURE 5.6–2

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5.6.1.5 Soil Screening Results

Soil screening results for areas south of Spruce Street, Process Areas 2 and 20, are included in Table 5.6-2. Soil screening results for areas north of Spruce Street, Process Areas 4, 7, 8, and 11, are included in Table 5.6-3.

Screening results for individual samples that exceeded criteria are reported under each process area below. VOCs exceeded NY State comparison criteria in 3 of the original 198 soil samples submitted for screening analysis. Generally, slightly elevated VOCs were reported in surface soil between Process Areas 4 and 7 (I100), Process Area 7 (G400, H400), Process Area 8 (E200), and the central portions of Process Areas 2 and 20. A similar spatial distribution of VOCs was reported with depth, with the highest concentrations reported in the semi-subsurface sample in the northeast area of Process Area 20 and in the subsurface samples from Process Area 2. PAH exceedances were limited to surface and semi-subsurface samples, up to 5 ft bgs, exclusively.

Process Area 2

The reported concentration of benzene exceeded the NY State comparison criteria in the sample collected from B100, at a depth of 13.5 ft bgs. The reported concentration of TCE exceeded the criteria in the sample collected from 2-BP2 at a depth of 13.5 ft bgs. In addition, reported concentrations of carbon tetrachloride (B100), cis-1,2 DCE (B100), trans-1,2 DCE (2-BP2, 2-BP3), 1,1-DCE (2-BP3), and PCE (C0, 2-BP3) exceeded 1/10th of the NY State comparison criteria. The reported concentrations of PAHs exceeded the NY State comparison criteria in locations B200, D200, and D300. Reported concentrations of PAHs exceeded 1/10th of the comparison criteria in samples collected from A0, A200, B0, B100, 2-BP1, 2-BP2, 2-BP3, C200, A300, C300, D0, and D100. PCB exceeded the comparison criteria in the surface soil sample collected from location D200. TNT was reported in samples collected from B200 and D300 in concentrations that did not exceed the NY State comparison criteria.

Process Area 4

Trace concentrations of VOCs were reported in samples collected from Area 4, however the concentrations did not exceed 1/10th of the NY State comparison criteria. PAHs reported in the semi-subsurface soil samples from K200 and 4-BP3 exceeded the NY State comparison criteria. Reported concentrations of PAHs in locations 4-BP1, 4-BP2, 4-BP3, J0, J100, J200, J500, K0, K100, K300, K400, L0, L100, L200, L300, L400, L500, I100, I200, and I400 exceeded 1/10th of the comparison criteria. TNT was reported in samples collected from locations I0 and I500 in concentrations that did not exceed 1/10th of the NY State comparison criteria.

Process Area 7

Trace concentrations of VOCs were reported in samples collected from Area 7, however the concentrations did not exceed 1/10th of the NY State comparison criteria. Reported concentrations of PAHs exceeded comparison criteria in surface soil samples collected from 7-BP3, H100, and H400. Reported PAH concentrations in samples collected from locations 7-BP1, 7-BP2, H0, H200, H500, G200, G300, and G400 exceeded 1/10th of the NY State comparison criteria. PCB were reported below comparison criteria in samples collected from 7-BP3 and I500. Trace concentrations of TNT were reported in location 7-BP1 at 4 ft bgs, I0 at 0.5 ft bgs, H0 between 13 and 14 ft bgs and I500 at 3.5 ft bgs. These concentrations did not exceed screening criteria.

Process Area 8

The reported concentration of carbon tetrachloride in the surface soil sample collected from E200 exceeded 1/10th of the NY State comparison criteria. Although the reported PAH concentrations did not exceed the NY State comparison criteria, the concentrations reported in locations 8-BP1, E0, E100, E200, E300, E400, E500, F0, F100, F300, G0, and G100 exceeded 1/10th of the NY State comparison criteria. Trace concentration of TNT was reported in location F0 between 13 and 14 ft bgs. The concentration did not exceed the comparison criteria. PCB were reported in the duplicate sample collected from location F500, from 13.5 to 14 ft bgs. The concentration did not exceed comparison criteria.

Process Area 11

Trace concentrations of TNT and PCB were reported in Process Area 7 in samples from H0, at the boundary between Areas 7 and 11. TNT, at concentrations below the NY State comparison criteria, was reported in the surface soil sample collected from location I0, between Process Area 4 and 11.

Process Area 20

The reported concentrations of TCA and 1,1-DCE exceeded the NY State comparison criteria in the sample collected from C500, at a depth of 3.5 ft bgs. Reported concentrations of trans-1,2

DCE and TCE exceeded 1/10th of the comparison criteria in the same sample. The reported concentration of PAHs exceeded the NY State comparison criteria in the surface sample collected from in B500. Reported concentrations of PAHs exceeded 1/10th of the comparison criteria in the surface sample collected from B400, the semi-subsurface sample collected from B500, and the subsurface sample collected from location C500. In addition, the reported concentration of PCB exceeded 1/10th of the comparison criteria in the surface sample collected from C500.

TNT was not reported in the soil screening results for samples collected from Area 20.

5.6.1.6 Laboratory Analyses and Confirmatory Soil Sample Results

At least one location from each process area with reported COPC was revisited. Additional screening and laboratory confirmatory samples were collected, screened, and submitted to the laboratory for full suite analysis.

Soil-Screening Results

The table below summarizes locations that were revisited and the reported field-screening data for each.

Sample Location	Process Area	Depth	Reported COPC in Original Sample	Reported COPC in Recollected Sample
2-BP2	2	4 and 14 ft	Trace PAHs, VOCs	Trace PAHs, VOCs
C0	2	14	Trace PAHs, VOCs	Trace PAHs, VOCs
D200	2/8	1	PAHs, PCB	PAHs, PCB
C500	20	4	Trace PAHs, VOCs	Trace PAHs, VOCs
4-BP1	4	0.3 and 14 ft	Trace PAHs, Trace VOCs	Trace PAHs
H0	7/11	13	Trace PAHs, TNT	Trace PAHs
H500	7	4	Trace PAHs, Trace VOCs	Trace PAHs, Trace VOCs

Generally, the reported concentrations in the re-collected samples were similar to those in the original samples. However, the PAHs that were reported above criteria in D200, as well as the TCA and 1,1-DCE reported in concentrations exceeding criteria in C500, did not exceed criteria in the additional samples collected for field screening.

Laboratory Results

Soil samples from Process Areas 2, 4, 7, 8, and 11 were submitted for laboratory analysis of full TCL/TAL anlytes, boron, lithium, and explosives. Soil samples from Process Area 20 were submitted for DOD marker compounds. A summary of reported analytes is presented in Tables 5.6-4 and 5.6-5.

VOCs, ranging up to 1,100 µg/kg of TCE in 2-BP2 at 14 ft bgs, exceeded the NY State comparison criteria in Process Area 2. In addition, estimated concentrations of methylene chloride exceeded comparison criteria in H500 at Process Area 7 and C0 at Process Area 2. However, methylene chloride was also reported in the associated blank. The concentration of PCE reported in the sample collected from C0 exceeded $1/10^{th}$ of the comparison criteria. VOCs were not reported in 2-BP2 (4 ft bgs), D200, H0, or 4-BP1. The trace concentrations of VOCs reported in the screening results for 2-BP2, at 4 ft bgs, were below the laboratory reporting limits and, therefore, were not expected to be reported in the results.

SVOCs were reported in each of the samples collected from Process Area 2 in concentrations that did not exceed the NY State comparison criteria. However, the reported concentrations of hexachlorobenzene in the samples collected from locations 2-BP2 and D200 exceeded $1/10^{th}$ of the comparison criteria. SVOCs were not reported in the samples collected from Process Areas 4, 7, or 11.

PAHs were reported in concentrations exceeding the NY State comparison criteria in 2-BP2 from 4 ft bgs and a duplicate sample collected from 2-BP2 at 14 ft bgs. PAHs were also reported D200 at concentrations that exceeded $1/10^{th}$ of the comparison criteria. PAHs were reported in 4-BP1 and H0 in concentrations that did not exceed $1/10^{th}$ of the comparison criteria. PAHs were not reported in C0, C500, and H00.

PCB were reported in the sample collected from D200. The total of the reported PCB aroclors exceeds the NY State comparison criteria.

Trace concentrations of pesticides were reported in each of the process areas east of Wesson Street (except Process Area 20 for which pesticides were not analyzed) in concentrations that did not exceed the NY State comparison criteria. However, the pesticide data were qualified by the laboratory and may be biased low. In addition the reported concentrations of heptachlor epoxide exceeded $1/10^{th}$ of the comparison criteria in the samples collected from locations 2-BP2 and

D200. The reported concentrations of aldrin and dieldrin in the sample collected from D200 also exceeded 1/10th of the comparison criteria.

Antimony exceeded the NY State comparison criteria in the samples collected from locations 2-BP2, C0, D200, and 4-BP1. Iron exceeded the comparison criteria in each of the samples submitted for TAL metals analysis. Nickel, zinc, and mercury exceeded the comparison criteria in the sample submitted from location 2-BP2 (at 4 ft bgs). The reported concentrations of mercury also exceeded the NY State comparison criteria in the samples submitted from 2-BP2 (14 ft bgs) and 4-BP1. Zinc also exceeded the comparison criteria in the sample collected from location D200. Additional metals concentrations exceeded 1/10th of the comparison criteria. Generally, the highest metals concentrations were reported in 2-BP2 and D200.

A trace concentration of cyanide was reported in D200.

Explosives were not reported in the soil samples collected at AFP-68, east of Wesson Street.

5.6.1.7 Ground-Water Sampling Program and Results

Due to the presence of COPC in the soil samples, ground-water samples were collected from locations 2-BP2, C0, C500, and 4-BP1. A 2-in. well point was installed in each of the locations except 4-BP1, in which a 1-in. well point was installed. The screening interval for 2-BP2 was placed from 4.9 to 14.9 ft bgs. The screening interval for C0 was 4.6 to 14.6 ft bgs. The screen was placed from 3 to 10 ft bgs in C500 and from 9 to 14 ft bgs in location 4-BP1.

Due to poor recharge of the aquifer, not enough volume of water was recovered to run a full suite of analyses for samples collected from 2-BP2, C0, and 4-BP1, as proposed in the Work Plan. The table below summarizes the laboratory analysis performed on each sample.

Location	VOCs	SVOCs	PCP	PAH	Pest/PCB	Metals	Boron/ Lithium	Cyanide	Explosives
2-BP2	X	X	X	X	X				X
C0	X	X							
C500							X		X
4-BP1	X	X	X	X	X				

A summary of reported analytes is presented in Tables 5.6-6 and 5.6-7.

VOCs were reported in concentrations that exceeded the NY State ground-water comparison criteria in the samples collected from 2-BP2 and C0 in Process Area 2. The reported concentration of 1,2-DCE TCE, and vinyl chloride exceeded the criteria in the sample collected from 2-BP2. The reported concentration of PCE, TCE, and vinyl chloride exceeded the criteria in the sample collected from C500. Additional VOCs exceeded 1/10th of the NY State comparison criteria in the samples collected from BP2 and C0.

SVOCs were reported in trace concentrations in the samples collected from 2-BP2 and C0. PAHs, specifically, benz[a]anthracene, benzo[k]fluoranthene, chrysene, and ideno[1,2,3-cd]pyrene were reported in concentrations exceeding the NY State comparison criteria in the sample collected from 2-BP2.

Trace concentrations of pesticides were reported in 4-BP1. The screening criteria value for the reported pesticides is 0 µg/kg.

The reported concentration of boron in the sample collected from C500 exceeded 1/10th of the NY State comparison criteria. Although a NY State comparison criteria does not exist for lithium, the concentration of lithium reported in the ground-water sample collected from C500 was elevated in comparison to the lithium concentrations reported in ground-water samples collected from other areas during this Phase I investigation.

TNT was reported in the sample collected from C500 in concentrations exceeding 1/10th of the NY State comparison criteria.

5.6.1.8 Conclusions and Recommendations

Process Areas 2, 7, and 11 have not been used by CWM. Process Area 4 has not been used by CWM, other than to stockpile clean soil. Process Areas 8 and 20 has been used by CWM to store equipment. However, potential impact associated with storage in these areas appears to be minimum. Impacts to these areas are therefore likely due to former DOD activities.

Process Area 2 should be further investigated to delineate the extent of PAHs in the semi-subsurface soil, the extent of VOCs in the subsurface soil, and the extent of VOCs and PAHs in the ground water. The extent of impact from elevated metals concentrations should also be evaluated. In addition, the elevated PCBs reported in the surface soil sample collected from D200 is recommended for further investigation. Elevated PCBs were also reported by the

Table 5.6-2 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-A0-0.0-0.5	C1-2-SO-A0-0.0-0.5-DUP	C1-2-SO-A0-11.5-12.0	C1-2-SO-A0-3.5-4.0	C1-2-SO-A100-0.0-0.5	C1-2-SO-A100-13.5-14.0	C1-2-SO-A100-3.5-4.0	C1-2-SO-A200-0.0-0.5	C1-2-SO-A200-13.5-14.0	C1-2-SO-A200-3.5-4.0	C1-2-SO-B0-0.0-0.5	C1-2-SO-B0-13.5-14.0	C1-2-SO-B0-13.5-14.0-DUP	C1-2-SO-B100-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM														
E4035	PAH	UG/KG	10000	NYTAGM	1252	1351	325	393	599	612	230	1599	1587	479	6145	797	825	8362
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		NA											NA	
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		NA				3.69							NA	
GC	BENZENE	UG/KG	60	NYTAGM		NA											NA	0.18
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM		NA											NA	
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		NA											NA	0.11
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		NA											NA	
GC	M & P-XYLENES	UG/KG	1200	NYTAGM		NA											NA	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		NA											NA	1.19
GC	TOLUENE	UG/KG	1500	NYTAGM		NA											NA	
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM		NA											NA	0.26
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		NA											NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-2 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-A0-0.0-0.5	C1-2-SO-B100-13.5-14.0	C1-2-SO-B100-3.5-4.0	C1-2-SO-B200-0.0-0.5	C1-2-SO-B200-13.5-14.0	C1-2-SO-B200-3.7-4.0	C1-2-SO-BP1-0.0-0.5	C1-2-SO-BP1-0.0-0.5-DUP	C1-2-SO-BP1-13.5-14.0	C1-2-SO-BP1-3.5-4.0	C1-2-SO-BP1-3.5-4.0-DUP	C1-2-SO-BP2-0.0-0.5	C1-2-SO-BP2-0.0-0.5-DUP
E4020	PCB	UG/KG	1000	NYTAGM											NA		
E4035	PAH	UG/KG	10000	NYTAGM	1252	869	383	12034	780	5519	1278	1214	789	783	NA	4784	4210
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE						70					NA		
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		66.07		16.7		5.43		NA					NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM				0.05	0.11			NA	5.18				NA
GC	BENZENE	UG/KG	60	NYTAGM		30864	0.21		1.33	0.09		NA					NA
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM		65.31						NA					NA
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM			39.23	0.08		2.36		NA	5.95				NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM								NA					NA
GC	M & P-XYLENES	UG/KG	1200	NYTAGM								NA					NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM			333.34	5.78	54.22	10.7	15.75	NA		83.35	76.13	0.15	NA
GC	TOLUENE	UG/KG	1500	NYTAGM					0.35	0.26		NA				0.9	NA
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM				0.26	2.32	5.69		NA	1.49			9.14	NA
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			159.71	1.72	0.82	37.36		NA			1.18	1.86	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = tected

Table 5.6-2 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-A0-0.0-0.5	C1-2-SO-BP2-13.5-14.0	C1-2-SO-BP2-14-DUP-REP	C1-2-SO-BP2-14-REP	C1-2-SO-BP2-3.5-4.0	C1-2-SO-BP2-4-REP	C1-2-SO-BP3-0.0-0.5	C1-2-SO-BP3-0.0-0.5-DUP	C1-2-SO-BP3-13.5-14.0	C1-2-SO-BP3-3.5-4.0	C1-2-SO-C0-0.0-0.5	C1-2-SO-CC-13.6-14.0
E4020	PCB	UG/KG	1000	NYTAGM												
E4035	PAH	UG/KG	10000	NYTAGM	1252	878	7517	481	904	1013	4905	4160	1107	607	612	561
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE												
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM								NA	5.09		8.9	
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		5.11						NA	269.46	1.26	1.43	
GC	BENZENE	UG/KG	60	NYTAGM								NA			0.72	
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM					56.63			NA				
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		4.23	1.8	1.26	0.43	1.78		NA		1.15		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM								NA				
GC	M & P-XYLENES	UG/KG	1200	NYTAGM								NA				
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM							25.47	NA	1057.42	0.45	2.8	154.18
GC	TOLUENE	UG/KG	1500	NYTAGM					0.55			NA				
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM		16.29	46.26	35.11	20.53	40.03		NA	34.28			
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		11752.98	1745.15	1390.34	80.44	0.7	21.93	NA	65			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-2 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-A0-0.0-0.5	C1-2-SO-C0-14-REP	C1-2-SO-C0-3.5-4.0	C1-2-SO-C200-0.0-0.5	C1-2-SO-C200-13.2-13.8	C1-2-SO-C200-13.2-13.8-DUP	C1-2-SO-C200-3.5-4.0	C1-2/20-SO-A300-0.0-0.5	C1-2/20-SO-A300-0.0-0.5 DUP	C1-2/20-SO-A300-13.5-14.0	C1-2/20-SO-A300-13.5-14.0-DUP	C1-2/20-SO-A300-3.5-4.0	C1-2/20-SO-B300-0.0-0.5	C1-2/20-SO-B300-13.5-14.0
E4020	PCB	UG/KG	1000	NYTAGM											NA			
E4035	PAH	UG/KG	10000	NYTAGM	1252	1407	480	2237	709	NA	691	2350	2277	546	NA	248	809	764
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE						NA					NA			
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM			6.47						NA					
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					5.12	5.01			NA	5.32	5.28			
GC	BENZENE	UG/KG	60	NYTAGM			0.33						NA					
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM									NA					
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		1.24	0.2						NA					
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM									NA					
GC	M & P-XYLENES	UG/KG	1200	NYTAGM									NA					
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		1041.65	3.93						NA	2.84	1.04			
GC	TOLUENE	UG/KG	1500	NYTAGM									NA	0.79	0.78			
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM		19.58			1.1	1.14			NA					
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		58.95	2.18				1.56		NA					

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
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Table 5.6-2 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-A0-0.0-0.5	C1-2/20-SO-B300-3.5-4.0	C1-2/20-SO-B300-3.5-4.0 DUP	C1-2/20-SO-C300-0.0-0.5	C1-2/20-SO-C300-13.5-14.0	C1-2/20-SO-C300-3.5-4.0	C1-2/20-SO-C300-3.5-4.0 DUP	C1-2/8-SO-D0-0.0-0.5	C1-2/8-SO-D0-0.0-0.5-DUP	C1-2/8-SO-D0-11.5-12.0	C1-2/8-SO-D0-3.5-4.0	C1-2/8-SO-D100-0.0-0.5	C1-2/8-SO-D100-11.5-12.0	C1-2/8-SO-D100-3.5-4.0
E4020	PCB	UG/KG	1000	NYTAGM			NA											
E4035	PAH	UG/KG	10000	NYTAGM	1252	445	NA	1954	327	304	564	789	777	1156	567	3778	484	547
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE			NA											
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM							NA		NA					
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM				4.08	0.97	0.6	NA		NA					
GC	BENZENE	UG/KG	60	NYTAGM							NA		NA					
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM							NA		NA					
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					0.19		NA		NA					
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				0.66	0.17	0.23	NA		NA					
GC	M & P-XYLENES	UG/KG	1200	NYTAGM							NA		NA					
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				0.12	0.1	0.16	NA		NA					
GC	TOLUENE	UG/KG	1500	NYTAGM					0.09		NA		NA					
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM					0.15		NA		NA					
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM				0.06	0.1	0.1	NA		NA					

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-2 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-A0-0.0-0.5	C1-2/8-SO-D200-0.0-0.5	C1-2/8-SO-D200-1-REP	C1-2/8-SO-D200-11.5-12.0	C1-2/8-SO-D200-3.5-4.0	C1-2/8/20-SO-D300-0.0-0.3	C1-2/8/20-SO-D300-0.0-0.3-DUP	C1-2/8/20-SO-D300-13.5-14.0	C1-2/8/20-SO-D300-3.5-4.0	C1-20-SO-A400-0.0-0.5	C1-20-SO-A400-13.5-14.0	C1-20-SO-A400-3.5-4.0	C1-20-SO-A500-0.0-0.5	C1-20-SO-A500-13.5-14.0
E4020	PCB	UG/KG	1000	NYTAGM		2800	1080											
E4035	PAH	UG/KG	10000	NYTAGM	1252	12057	4675	497	586	10717	18355	906	959	456	327	306	920	301
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE							80							
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM							NA							
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM							NA			0.03				
GC	BENZENE	UG/KG	60	NYTAGM							NA							
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM							NA							
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM							NA							
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM							NA							
GC	M & P-XYLENES	UG/KG	1200	NYTAGM							NA							
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM							NA							
GC	TOLUENE	UG/KG	1500	NYTAGM							NA							
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM							NA							
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			1.33				NA							

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.6-2 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-A0-0.0-0.5	C1-20-SO-A500-3.5-4.0	C1-20-SO-A500-3.5-4.0-DUP	C1-20-SO-B400-0.0-0.5	C1-20-SO-B400-11.5-12.0	C1-20-SO-B400-3.5-4.0	C1-20-SO-B500-0.0-0.5	C1-20-SO-B500-0.0-0.5-DUP	C1-20-SO-B500-13.5-14.0	C1-20-SO-B500-3.5-4.0	C1-20-SO-BP1-0.0-0.5	C1-20-SO-BP1-13.5-14.0	C1-20-SO-BP1-3.5-4.0	C1-20-SO-BP2-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM			NA											
E4035	PAH	UG/KG	10000	NYTAGM	1252	301	NA	1054	282	418	32380	30791	479	2496	142	482	268	516
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE			NA											
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM								NA		6.32				
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM								NA						
GC	BENZENE	UG/KG	60	NYTAGM							1.13	NA	2.22	1.37				
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM								NA						
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				0.27				NA						
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM								NA						
GC	M & P-XYLENES	UG/KG	1200	NYTAGM								NA			2.15			
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM								NA					0.23	2.27
GC	TOLUENE	UG/KG	1500	NYTAGM								NA			0.75	0.45	0.45	
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM				1.34				NA						
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM								NA			0.07	0.22	0.42	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-2 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-A0-0.0-0.5	C1-20-SO-BP2-11.5-12.0	C1-20-SO-BP2-3.5-4.0	C1-20-SO-BP3-0.0-0.5	C1-20-SO-BP3-13.5-14.0	C1-20-SO-BP3-3.5-4.0	C1-20-SO-C400-0.0-0.5	C1-20-SO-C400-13.5-14.0	C1-20-SO-C400-3.5-4.0	C1-20-SO-C500-0.0-0.5	C1-20-SO-C500-13.5-14.0	C1-20-SO-C500-3.5-4.0	C1-20-SO-C500-3.5-4.0-DUP	C1-20-SO-C500-4.0-DUP
E4020	PCB	UG/KG	1000	NYTAGM										260				
E4035	PAH	UG/KG	10000	NYTAGM	1252	729	229	358	692	311	477	498	360	918	1164	165	269	332
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM							16.34					851.69	NA	NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM							0.1					432.68	NA	NA
GC	BENZENE	UG/KG	60	NYTAGM							0.16						NA	NA
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM													NA	NA
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM												6.26	NA	NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM							0.53						NA	NA
GC	M & P-XYLENES	UG/KG	1200	NYTAGM													NA	NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM							0.14			5.09			NA	NA
GC	TOLUENE	UG/KG	1500	NYTAGM							1.38						NA	NA
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM							0.13					43.24	NA	NA
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM							0.07					489.84	NA	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-2 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-A0-0.0-0.5	C1-20-SO-C500-4.0-REP
E4020	PCB	UG/KG	1000	NYTAGM		
E4035	PAH	UG/KG	10000	NYTAGM	1252	294
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE		
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		177.99
GC	BENZENE	UG/KG	60	NYTAGM		
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		51.52
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		1.65
GC	TOLUENE	UG/KG	1500	NYTAGM		1.29
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		16.46

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-4-SO-BP1-0.3-REP	C1-4-SO-BP1-13.5-14.0	C1-4-SO-BP1-14-REP	C1-4-SO-BP1-3.5-4.0	C1-4-SO-BP2-0.0-0.5	C1-4-SO-BP2-0.0-0.5-DUP	C1-4-SO-BP2-13.5-14.0	C1-4-SO-BP2-3.5-4.0	C1-4-SO-BP3-0.0-0.5	C1-4-SO-BP3-13.5-14.0	C1-4-SO-BP3-3.5-4.0	C1-4-SO-J0	C1-4-SO-J0-1.3-2.0
E4020	PCB	UG/KG	1000	NYTAGM														
E4035	PAH	UG/KG	10000	NYTAGM	558	543	531	1025		1101	1156	519	355	1046	756	20629	3090	1707
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM							NA							
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM							NA							
GC	BENZENE	UG/KG	60	NYTAGM							NA							
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM			15.67				NA							
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM							NA							
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM							NA							
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02					8.39	NA							
GC	O-XYLENE	UG/KG	1200	NYTAGM							NA							
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86		0.17		0.05		NA							
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11				0.07		NA							
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57		0.19		0.27		NA							
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09						NA							

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-4-SO-J0-1.3-2.0-DUP	C1-4-SO-J0-11.3-12.0	C1-4-SO-J0-3.3-4.0	C1-4-SO-J100	C1-4-SO-J100-1.3-2.0	C1-4-SO-J100-11.3-12.0	C1-4-SO-J100-3.3-4.0	C1-4-SO-J200-11.3-12.0	C1-4-SO-J500-13.0-13.7	C1-4-SO-J500-3.3-4.0	C1-4-SO-J500-5.3-6.0	C1-4-SO-K0	C1-4-SO-K0-1.3-2.0	C1-4-SO-K0-1.3-2.0-DUP
E4020	PCB	UG/KG	1000	NYTAGM															
E4035	PAH	UG/KG	10000	NYTAGM	558	NA	785	671	1341	1107	1664	960	1628	314	237	1737	6565	236	
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE															
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		NA													
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		NA													
GC	BENZENE	UG/KG	60	NYTAGM		NA													
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM		NA													
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		NA													
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		NA													
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02	NA													
GC	O-XYLENE	UG/KG	1200	NYTAGM		NA													
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86	NA													
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11	NA													
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57	NA													
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09	NA													

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = [illegible]tected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-4-SO-K0-13.3-14.0	C1-4-SO-K0-15.3-16.0	C1-4-SO-K0-15.3-16.0-DUP	C1-4-SO-K0-5.3-6.0	C1-4-SO-K100	C1-4-SO-K100-1.3-2.0	C1-4-SO-K100-13.3-14.0	C1-4-SO-K100-3.3-4.0	C1-4-SO-K200-0.0-0.5	C1-4-SO-K200-0.0-0.5-DUP	C1-4-SO-K200-3.3-4.0	C1-4-SO-K300	C1-4-SO-K300-1.3-2.0
E4020	PCB	UG/KG	1000	NYTAGM														
E4035	PAH	UG/KG	10000	NYTAGM	558	404	689	689	82	4950	4311	811	321	820	1548	11749	323	1333
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM			1.71	NA							NA			
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM				NA							NA			
GC	BENZENE	UG/KG	60	NYTAGM				NA							NA			
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM				NA							NA			
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA					15.41		NA			
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA							NA			
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02			NA							NA			
GC	O-XYLENE	UG/KG	1200	NYTAGM				NA							NA			
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86			NA							NA			
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11			NA			0.75	0.34			NA			
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57			NA							NA			
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09			NA							NA			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-4-SO-K300-13.3-14.0	C1-4-SO-K300-3.3-4.0	C1-4-SO-K400	C1-4-SO-K400-1.3-2.0	C1-4-SO-K400-11.0-11.7	C1-4-SO-K400-3.3-4.0	C1-4-SO-K500	C1-4-SO-K500-1.3-2.0	C1-4-SO-K500-11.0-11.7	C1-4-SO-K500-3.3-4.0	C1-4-SO-K500-3.3-4.0-DUP	C1-4-SO-L0	C1-4-SO-L0-1.3-2.0	C1-4-SO-L0-3.3-4.0	C1-4-SO-L0-9.3-10.0
E4020	PCB	UG/KG	1000	NYTAGM																
E4035	PAH	UG/KG	10000	NYTAGM	558	94	174	7489	444	556	508	473		439	237	351	1537		86	76
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE																
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM																
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM																
GC	BENZENE	UG/KG	60	NYTAGM																
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM																
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM																
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM																
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02															
GC	O-XYLENE	UG/KG	1200	NYTAGM																
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86															
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11															
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57															
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09															

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-4-SO-L100	C1-4-SO-L100-1.3-2.0	C1-4-SO-L100-11.3-12.0	C1-4-SO-L100-3.3-4.0	C1-4-SO-L100-9.3-10.0	C1-4-SO-L100-9.3-10.0-DUP	C1-4-SO-L100-DUP	C1-4-SO-L200	C1-4-SO-L200-1.3-2.0	C1-4-SO-L200-3.2-4.0	C1-4-SO-L200-9.3-10.0	C1-4-SO-L300	C1-4-SO-L300-1.3-2.0	C1-4-SO-L300-13.3-14.0
E4020	PCB	UG/KG	1000	NYTAGM															
E4035	PAH	UG/KG	10000	NYTAGM	558	1716	186	1567	99	271	NA	1778	1651	542	938	1574	1674	1249	2063
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE															
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM							NA	NA							
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM							NA	NA							
GC	BENZENE	UG/KG	60	NYTAGM							NA	NA							
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM							NA	NA							
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM							NA	NA							
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM							NA	NA							
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02						NA	NA							
GC	O-XYLENE	UG/KG	1200	NYTAGM							NA	NA							
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86						NA	NA							
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11						NA	NA							
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57						NA	NA							
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09						NA	NA							

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-4-SO-L300-13.3-14.0-DUP	C1-4-SO-L300-15.3-16.0	C1-4-SO-L300-3.3-4.0	C1-4-SO-L400	C1-4-SO-L400-1.3-2.0	C1-4-SO-L400-11.3-12.0	C1-4-SO-L400-5.3-5.6	C1-4-SO-L400-5.3-6.0	C1-4-SO-L500	C1-4-SO-L500-1.3-2.0	C1-4/7-SO-I0-0.0-0.5	C1-4/7-SO-I0-13.3-14.0	C1-4/7-SO-I0-5.3-6.0	C1-4/7-SO-I100-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM		NA							NA						
E4035	PAH	UG/KG	10000	NYTAGM	558	NA	1773	1010	1473	686	692	338	NA	1346	462	372	629	561	5050
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE		NA							NA			170			
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM								NA							
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM								NA							
GC	BENZENE	UG/KG	60	NYTAGM								NA							
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM								NA							
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM								NA							
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM								NA							2.81
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02							NA							6.08
GC	O-XYLENE	UG/KG	1200	NYTAGM								NA							
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86							NA							2.86
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11							NA					2.77		1.13
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57							NA							0.13
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09							NA							0.54

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-4/7-SO-I100-0.0-0.5-DUP	C1-4/7-SO-I100-13.3-14.0	C1-4/7-SO-I100-3.3-4.0	C1-4/7-SO-I100-3.3-4.0-DUP	C1-4/7-SO-I200-0.0-0.5	C1-4/7-SO-I200-13.3-14.0	C1-4/7-SO-I200-3.3-4.0	C1-4/7-SO-I400-0.0-0.5	C1-4/7-SO-I400-11.3-12.0	C1-4/7-SO-I400-3.2-4.0	C1-4/7-SO-I500-0.0-0.5	C1-4/7-SO-I500-11.3-12.0	C1-4/7-SO-I500-11.3-12.0 DUP
E4020	PCB	UG/KG	1000	NYTAGM					NA									NA
E4035	PAH	UG/KG	10000	NYTAGM	558	5028	734	557	NA	1522	584	647	553	1003	545	461	547	NA
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE					NA									NA
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		NA												
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		NA												
GC	BENZENE	UG/KG	60	NYTAGM		NA												
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM		NA												
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		NA												
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		NA												
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02	NA		2.01										
GC	O-XYLENE	UG/KG	1200	NYTAGM		NA												
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86	NA	0.46	0.87	0.4									
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11	NA	0.21	0.4	0.4	16.02	6.79	16.77						
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57	NA		0.05	0.08									
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09	NA	0.04	0.09	0.07									

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-4/7-SO-I500-3.5-4.0	C1-7-SO-BP1-0.0-0.5	C1-7-SO-BP1-13.3-14.0	C1-7-SO-BP1-3.3-4.0	C1-7-SO-BP2-0.0-0.5	C1-7-SO-BP2-13.2-14.0	C1-7-SO-BP2-13.5-14.0	C1-7-SO-BP2-3.5-4.0	C1-7-SO-BP3-11.5-12.0	C1-7-SO-BP3-5.0-5.5	C1-7-SO-H300-0.0-0.5	C1-7-SO-H300-0.0-0.5-DUP	C1-7-SO-H300-13.3-14.0	C1-7-SO-H400-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM							NA			260					
E4035	PAH	UG/KG	10000	NYTAGM	558	612	4049	558	465	1775	NA	1029	372	9614	32299	81	552	483	13042
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE		300			90			NA							
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM								NA					NA		0.46
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM								NA			1.78		NA		
GC	BENZENE	UG/KG	60	NYTAGM								NA			0.66		NA		
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM								NA					NA		4.6
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM								NA			0.54		NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM								NA					NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02							NA					NA		
GC	O-XYLENE	UG/KG	1200	NYTAGM								NA					NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86		0.29					NA					NA		
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11							NA					NA		0.07
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57		0.04	0.05	0.06			NA			4.87	0.19	NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09							NA					NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-7-SO-H400-13.3-14.0	C1-7-SO-H400-13.3-14.0-DUP	C1-7-SO-H400-3.3-4.0	C1-7-SO-H500-0.0-0.5	C1-7-SO-H500-11.2-12.0	C1-7-SO-H500-11.2-12.0-DUP	C1-7-SO-H500-3.3-4.0	C1-7-SO-H500-4-REP	C1-7-SO-H500-4.0-DUP	C1-7/11-SO-H0-0.0-0.5	C1-7/11-SO-H0-0.0-0.5-DUP	C1-7/11-SO-H0-13-REP	C1-7/11-SO-H0-13.3-14.0
E4020	PCB	UG/KG	1000	NYTAGM			NA				NA					383		
E4035	PAH	UG/KG	10000	NYTAGM	558	244	NA	737	1462	1096	NA	345	1550	1219	458		450	592
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE			NA				NA							270
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		0.83	0.93	0.39						NA		NA		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM										NA		NA		
GC	BENZENE	UG/KG	60	NYTAGM										NA		NA		
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM		8.05	10.27	5.19						NA		NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		0.03	0.05							NA		NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM										NA		NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02									NA		NA		
GC	O-XYLENE	UG/KG	1200	NYTAGM									2.55	NA		NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86									NA		NA		
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11	0.07	0.11					17.11		NA		NA		2.32
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57	0.09	0.1							NA		NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09								2.09	NA		NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-7/11-SO-H0-13.3-14.0 DUP	C1-7/11-SO-H0-3.3-4.0	C1-7/11-SO-H100-0.0-0.3	C1-7/11-SO-H100-13.3-14.0	C1-7/11-SO-H100-3.3-4.0	C1-7/11-SO-H200-0.0-0.5	C1-7/11-SO-H200-0.0-0.5 DUP	C1-7/11-SO-H200-13.3-14.0	C1-7/11-SO-H200-3.3-4.0	C1-7/8-SO-G300-0.0-0.5	C1-7/8-SO-G300-0.0-0.5-DUP	C1-7/8-SO-G300-11.3-12.0	C1-7/8-SO-G300-3.3-4.0
E4020	PCB	UG/KG	1000	NYTAGM		NA												
E4035	PAH	UG/KG	10000	NYTAGM	558	NA	2178	36948	880	135	867	771	1524	371	3011	3368	591	329
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE		NA												
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM								NA				NA		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM								NA				NA		
GC	BENZENE	UG/KG	60	NYTAGM								NA				NA		
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM								NA				NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM								NA				NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM								NA				NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02							NA				NA		
GC	O-XYLENE	UG/KG	1200	NYTAGM								NA				NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86			0.12		10		NA			0.16	NA	0.06	10.8
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11						4.13	NA	6.14	8.31		NA		
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57			0.08				NA				NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09			0.2	0.03	1.87		NA				NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = etected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-7/8-SO-G400-0.0-0.5	C1-7/8-SO-G400-13.3-14.8	C1-7/8-SO-G400-3.3-4.0	C1-7/8-SO-G400-3.3-4.0-DUP	C1-7/8-SO-G500-0.0-0.5	C1-7/8-SO-G500-13.3-14.0	C1-7/8-SO-G500-3.3-4.0	C1-7/8/11-SO-G200-0.0-0.5	C1-7/8/11-SO-G200-1.3-2.0	C1-7/8/11-SO-G200-13.3-14.0	C1-7/8/11-SO-G200-2.4-3.0	C1-8-SO-BP1-0.0-0.5	C1-8-SO-BP1-13.5-14.0
E4020	PCB	UG/KG	1000	NYTAGM														
E4035	PAH	UG/KG	10000	NYTAGM	558	638	1096	479	558	558	756	786	5223	693	698	657	1866	525
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		1.47			NA	1.26		0.81						
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA									
GC	BENZENE	UG/KG	60	NYTAGM					NA									
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM					NA									
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA									
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM					NA									
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02				NA									
GC	O-XYLENE	UG/KG	1200	NYTAGM					NA									
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86				NA									
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11	0.1			NA	0.07		0.09						
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57				NA									
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09				NA									

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-8-SO-BP1-3.5-4.0	C1-8-SO-E0-0.0-0.5	C1-8-SO-E0-0.0-0.5-DUP	C1-8-SO-E0-13.5-14.0	C1-8-SO-E0-3.3-4.0	C1-8-SO-E100-0.0-0.5	C1-8-SO-E100-13.5-14.0	C1-8-SO-E100-13.5-14.0-DUP	C1-8-SO-E100-3.5-4.0	C1-8-SO-E200-0.0-0.5	C1-8-SO-E200-13.5-14.0	C1-8-SO-E200-3.5-4.0	C1-8-SO-E300-0.0-0.4
E4020	PCB	UG/KG	1000	NYTAGM									NA					
E4035	PAH	UG/KG	10000	NYTAGM	558	386	2993	2603	862	503	2849	786	NA	495	2815	782	413	1604
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE									NA					
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM				NA							6.53			
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM				NA							0.4			
GC	BENZENE	UG/KG	60	NYTAGM				NA										
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM				NA							271.2			
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA			0.16				0.41			
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA										
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02			NA										
GC	O-XYLENE	UG/KG	1200	NYTAGM				NA										
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86			NA							0.46			
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11			NA							0.63			
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57		0.07	NA		0.04					0.93			
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09			NA							0.42			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = [illegible]etected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-8-SO-E300-15.5-16.0	C1-8-SO-E300-3.5-4.0	C1-8-SO-E400-0.0-0.5	C1-8-SO-E400-15.5-16.0	C1-8-SO-E400-3.3-4.0	C1-8-SO-E500-0.0-0.5	C1-8-SO-E500-0.0-0.5-DUP	C1-8-SO-E500-13.5-14.0	C1-8-SO-E500-13.5-14.0-DUP	C1-8-SO-E500-3.5-4.0	C1-8-SO-F0-0.0-0.5	C1-8-SO-F0-0.0-0.5-DUP	C1-8-SO-F0-12.5-13.0	C1-8-SO-F100-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM										NA					
E4035	PAH	UG/KG	10000	NYTAGM	558	352	505	7465	989	167	3582	3856	846	NA	288	1152	1015	721	2016
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE										NA			80	190	
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM					NA			NA					NA		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA			NA					NA		
GC	BENZENE	UG/KG	60	NYTAGM					NA			NA					NA		
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM					NA			NA					NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA			NA					NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM					NA			NA					NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02				NA			NA					NA		
GC	O-XYLENE	UG/KG	1200	NYTAGM					NA			NA					NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86				NA			NA					NA		
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11				NA			NA					NA		
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57				NA			NA					NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09				NA			NA					NA		

Note: *Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.*
NA = not analyzed
blank = not detected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-8-SO-F100-12.5-13.0	C1-8-SO-F100-12.5-13.0-DUP	C1-8-SO-F100-3.0-3.8	C1-8-SO-F200-0.0-0.5	C1-8-SO-F200-13.2-14.0	C1-8-SO-F200-3.3-4.0	C1-8-SO-F300-0.0-0.5	C1-8-SO-F300-15.3-16.0	C1-8-SO-F300-3.3-4.0	C1-8-SO-F400-0.0-0.5	C1-8-SO-F400-13.3-14.0	C1-8-SO-F400-3.3-4.0	C1-8-SO-F500-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM			NA											
E4035	PAH	UG/KG	10000	NYTAGM	558	1224	NA	295	398	672	276	2649	588	215	479	687	247	462
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE			NA											
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM												5.03		1.14
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM														
GC	BENZENE	UG/KG	60	NYTAGM														
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM														
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM														
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM														
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02													
GC	O-XYLENE	UG/KG	1200	NYTAGM														
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86													
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11												1.08	
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57							0.07	0.04	0.05	0.05	0.12	0.05	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09													

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = 'etected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-8-SO-F500-13.3-14.0	C1-8-SO-F500-13.3-14.0-DUP	C1-8-SO-F500-3.3-4.0	C1-8/11-SO-G0-0.0-0.5	C1-8/11-SO-G0-1.3-2.0	C1-8/11-SO-G0-3.5-4.0	C1-8/11-SO-G100-0.0-0.5	C1-8/11-SO-G100-1.3-2.0	C1-8/11-SO-G100-12.5-13.2	C1-8/11-SO-G100-3.0-3.7	C1-8/20-SO-D400-0.0-0.5	C1-8/20-SO-D400-13.5-14.0	C1-8/20-SO-D400-3.5-4.0
E4020	PCB	UG/KG	1000	NYTAGM			667											
E4035	PAH	UG/KG	10000	NYTAGM	558	677		356	2991	2264	4924	2926	927	1028	3889	715	764	375
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM			NA											
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM			NA											
GC	BENZENE	UG/KG	60	NYTAGM			NA											
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM			NA											
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM			NA											
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM			NA											
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02		NA											
GC	O-XYLENE	UG/KG	1200	NYTAGM			NA											
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86		NA											
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11		NA											
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57	0.08	NA	0.07										
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09	0.04	NA											

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-3 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.0-0.5	C1-8/20-SO-D500-0.0-0.5	C1-8/20-SO-D500-13.5-14.0	C1-8/20-SO-D500-13.5-14.0-DUP	C1-8/20-SO-D500-3.5-4.0
E4020	PCB	UG/KG	1000	NYTAGM				NA	
E4035	PAH	UG/KG	10000	NYTAGM	558	458	651	NA	182
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE				NA	
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		24.13			
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		4.72	0.44	0.49	
GC	BENZENE	UG/KG	60	NYTAGM		0.15			
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM					
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		0.15			
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		1.55			
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	0.02				
GC	O-XYLENE	UG/KG	1200	NYTAGM					
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	7.86	0.23			
GC	TOLUENE	UG/KG	1500	NYTAGM	0.11	1.35			
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM	0.57	1.23			
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	0.09	0.24			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.6-4 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-BP2-14-DUP-REP	C1-2-SO-BP2-14-REP	C1-2-SO-BP2-4-REP	C1-2-SO-C0-14-REP	C1-2/8-SO-D200-1-REP	C1-20-SO-C500-4.0-REP
E160.3	PERCENT MOISTURE	%			12.9	12.8	12.4	14.2	13.4	NA
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	9710	6840	8690	10700	9140	NA
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.55 BN	0.35 B	0.81 N	0.7 B	0.84 N	NA
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	3.2	3.5	2.7	2.6	2.9	NA
SW6010	BARIUM	MG/KG	300	NYTAGM	66.6	89.3	67.4	103	82.4	NA
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.39 B	0.22 B	0.4 B	0.4 B	0.54	NA
SW6010	BORON	MG/KG			7.6 B	6.1 B	15	14	8 BN	1.7 B
SW6010	CADMIUM	MG/KG	10	NYTAGM			0.4 B		0.29 B	NA
SW6010	CALCIUM	MG/KG			52100 *	67500 *	43600 *	5000 *	59900 *	NA
SW6010	CHROMIUM	MG/KG	50	NYTAGM	14.2	10.5	27.9	15.8	28.6	NA
SW6010	COBALT	MG/KG	30	NYTAGM	8.9	8.6	7	9.8	6.5	NA
SW6010	COPPER	MG/KG	50	NYTAGM-BG	30	30.4	47.7	27.8	50.3	NA
SW6010	IRON	MG/KG	2000	NYTAGM	23400	20600	26800	2490	17800	NA
SW6010	LEAD	MG/KG	400	NYTAGM	5.7	6.4	45	6.1	34.5	NA
SW6010	LITHIUM	MG/KG			24	17	18.8	26	16.5	6.2
SW6010	MAGNESIUM	MG/KG			9410	9150	11300	9780	18300	NA
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	679	1220	684	636	679	NA
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	19	15.4	29.8	20.8	14	NA
SW6010	POTASSIUM	MG/KG			1720	1190	1200	1960	1080	NA
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG		0.26 B		0.4 B	0.97	NA
SW6010	SODIUM	MG/KG			211	191	206	259	210	NA
SW6010	VANADIUM	MG/KG	150	NYTAGM	18.6	14.7	16.5	21	16.3	NA
SW6010	ZINC	MG/KG	76	NYTAGM-BG	44.6	35.3	77.3	48	87.7	NA
SW7471	MERCURY	MG/KG	0.1	NYTAGM		0.3 B	4.1			NA
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG	0.17 B		0.14 B	0.18 B	0.15 B	NA
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM	2.9 P		2 P		16 P	NA
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM	2.8 P		4.5 P		10 P	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

Table 5.6-4 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-BP2-14-DUP-REP	C1-2-SO-BP2-14-REP	C1-2-SO-BP2-4-REP	C1-2-SO-C0-14-REP	C1-2/8-SO-D200-1-REP	C1-20-SO-C500-4.0-REP
SW8081	ALDRIN	UG/KG	41	NYTAGM	1.4 P		1.8 P		26 P	NA
SW8081	ALPHA-BHC	UG/KG	110	NYTAGM					1.3 P	NA
SW8081	ALPHA-CHLORDANE	UG/KG	540	NYTAGM					1.7 P	NA
SW8081	DELTA-BHC	UG/KG	300	NYTAGM					4.4 P	NA
SW8081	DIELDRIN	UG/KG	44	NYTAGM					8.6 P	NA
SW8081	ENDOSULFAN I	UG/KG	900	NYTAGM	1.8 P		2.1 P		1.7 P	NA
SW8081	ENDOSULFAN SULFATE	UG/KG	1000	NYTAGM			2.4 P		2.1 P	NA
SW8081	ENDRIN	UG/KG	100	NYTAGM					7.5 P	NA
SW8081	ENDRIN ALDEHYDE	UG/KG			7.5 P		2.4 P		16 P	NA
SW8081	ENDRIN KETONE	UG/KG			5.8 P		3.1 P		3.4 P	NA
SW8081	GAMMA-CHLORDANE	UG/KG	540	NYTAGM					4.1 P	NA
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM	8.2 P		9.2 P		14 P	NA
SW8081	METHOXYCHLOR	UG/KG							6.1 P	NA
SW8082	AROCLOR 1248	UG/KG	1000	NYTAGM					960 D	NA
SW8082	AROCLOR 1254	UG/KG	1000	NYTAGM					440	NA
SW8082	AROCLOR 1260	UG/KG	1000	NYTAGM					480 P	NA
SW8260	METHYLENE CHLORIDE	UG/KG	100	NYTAGM				120 JB		NA
SW8260	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				570		NA
SW8260	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	1000	1100				NA
SW8270	BENZYL BUTYL PHTHALATE	UG/KG	50000	NYTAGM					650	NA
SW8270	BIS(2-ETHYLHEXYL) PHTHAL	UG/KG	50000	NYTAGM	850	160	7700 D	340	940	NA
SW8270	CARBAZOLE	UG/KG					840			NA
SW8270	DI-N-OCTYL PHTHALATE	UG/KG	50000	NYTAGM					170	NA
SW8270	DIBENZOFURAN	UG/KG	6200	NYTAGM			400			NA
SW8270	HEXACHLOROBENZENE	UG/KG	410	NYTAGM			370		120	NA
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM	720		2200		250	NA
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM	68	1.7	190		18	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = no' ·alyzed

blank = ·tected

Table 5.6-4 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), *Summary of Detected Analytes in Soil* (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-SO-BP2-14-DUP-REP	C1-2-SO-BP2-14-REP	C1-2-SO-BP2-4-REP	C1-2-SO-C0-14-REP	C1-2/8-SO-D200-1-REP	C1-20-SO-C500-4.0-REP
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM	140	7	470 D		39	NA
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM	150	8.9	480 D		53	NA
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	160	11	530		60	NA
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	96	9	300		38	NA
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	71	4.5	230		25	NA
SW8310	CHRYSENE	UG/KG	400	NYTAGM	120	5.5	340 D		29	NA
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM	15		44		5.1	NA
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	370	20	1200 D		120	NA
SW8310	FLUORENE	UG/KG	50000	NYTAGM	34	31	110		8.4	NA
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM	49	3.2	170		19	NA
SW8310	NAPHTHALENE	UG/KG	13000	NYTAGM	12		74		11	NA
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	280		840 D		79	NA
SW8310	PYRENE	UG/KG	50000	NYTAGM	270	15	900 D		83	NA
SW9012	CYANIDE	MG/KG							2.2	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 5.6-5 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.3-REP	C1-4-SO-BP1-14-REP	C1-7-SO-H500-4-REP	C1-7/11-SO-H0-13-REP
E160.3	PERCENT MOISTURE	%			11.8	11.8	16.4	15.4
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	9340	11000	13000	3540
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.45 BN	0.72 N	0.47 BN	0.3 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	5.5	2.3	2.3	1.8
SW6010	BARIUM	MG/KG	300	NYTAGM	199 E	87.6	65.9	28.9
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.42 B	0.45 B	0.51 B	0.08 B
SW6010	BORON	MG/KG			3.8 B	9.5 B	8.9 B	2.1 BN
SW6010	CALCIUM	MG/KG			36200	48500 *	51800 *	35900 *
SW6010	CHROMIUM	MG/KG	50	NYTAGM	19.7 N	16.1	18.2	5.2
SW6010	COBALT	MG/KG	30	NYTAGM	10.5	10.1	10.3	3 B
SW6010	COPPER	MG/KG	50	NYTAGM-BG	37.8	25.1	29.2	19.2
SW6010	IRON	MG/KG	2000	NYTAGM	24900	25300	27200	10500
SW6010	LEAD	MG/KG	400	NYTAGM	9.6	5.8	6.5	3
SW6010	LITHIUM	MG/KG			17.9	27.5	26.5	6.5
SW6010	MAGNESIUM	MG/KG			9800	11300	10500	3840
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	2520	682	675	676
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	19.7	20.6	22	7.1
SW6010	POTASSIUM	MG/KG			1130	2320	2210	603
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG		0.28 B		0.44 B
SW6010	SODIUM	MG/KG			149	273	222	196
SW6010	VANADIUM	MG/KG	150	NYTAGM	21.6	21.5	24	9.1
SW6010	ZINC	MG/KG	76	NYTAGM-BG	49.2 N	47.5	52	21.1
SW7471	MERCURY	MG/KG	0.1	NYTAGM	0.12 BN			
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG		0.15 BW	0.14 B	
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM			0.56 P	
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM	0.28 P		0.36 P	
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM			0.46 P	0.32 P

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

Table 5.6-5 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-SO-BP1-0.3-REP	C1-4-SO-BP1-14-REP	C1-7-SO-H500-4-REP	C1-7/11-SO-H0-13-REP
SW8260B	CHLOROBENZENE	UG/KG	1700	NYTAGM		110 J		
SW8260B	METHYLENE CHLORIDE	UG/KG	100	NYTAGM			130 JB	
SW8260B	TOLUENE	UG/KG	1500	NYTAGM		110 J		
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM				18
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM				1.2
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM				3.6
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM				5.3
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	1.8			5.1
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	1.9			3.9
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	0.63			2.5
SW8310	CHRYSENE	UG/KG	400	NYTAGM				2.5
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	0.99			9.9
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM	1.2			2.6
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	0.68	0.81		10
SW8310	PYRENE	UG/KG	50000	NYTAGM	1.4			8.8

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-6 Component 1, Former AFP-68 Process Areas 2 and 20 (East of Wesson Street), Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-2-GW-BP2	C1-2-GW-CO	C1-20-GW-C500
SW6010	BORON	D	UG/L	1000	NYSTANDARD	NA	NA	173
SW6010	BORON	T	UG/L	1000	NYSTANDARD	NA	NA	311
SW6010	LITHIUM	T	UG/L			NA	NA	446
SW8260B	1,2-DICHLOROETHENE, TOTAL	N	UG/L	5	NYSTANDARD	410		NA
SW8260B	ACETONE	N	UG/L	50	NYGUIDANCE		14 B	NA
SW8260B	CHLOROFORM	N	UG/L	7	NYSTANDARD		3	NA
SW8260B	TETRACHLOROETHENE	N	UG/L	5	NYSTANDARD		8100 D	NA
SW8260B	TRICHLOROETHYLENE	N	UG/L	5	NYSTANDARD	37000 D	120 D	NA
SW8260B	VINYL CHLORIDE	N	UG/L	5	NYSTANDARD	63	6	NA
SW8270C	BIS(2-ETHYLHEXYL) PHTHALATE	N	UG/L	50	NYSTANDARD	8	9	NA
SW8310	ACENAPHTHENE	N	UG/L	20	NYGUIDANCE	1.2	NA	NA
SW8310	ANTHRACENE	N	UG/L	50	NYGUIDANCE	0.09	NA	NA
SW8310	BENZ[A]ANTHRACENE	N	UG/L	0.002	NYGUIDANCE	0.3	NA	NA
SW8310	BENZO[A]PYRENE	N	UG/L	0	NYSTANDARD	0.35	NA	NA
SW8310	BENZO[B]FLUORANTHENE	N	UG/L	2	NYGUIDANCE	0.37	NA	NA
SW8310	BENZO[GHI]PERYLENE	N	UG/L			0.24	NA	NA
SW8310	BENZO[K]FLUORANTHENE	N	UG/L	0.002	NYGUIDANCE	0.16	NA	NA
SW8310	CHRYSENE	N	UG/L	0.002	NYGUIDANCE	0.24	NA	NA
SW8310	DIBENZ[A,H]ANTHRACENE	N	UG/L			0.04	NA	NA
SW8310	FLUORANTHENE	N	UG/L	50	NYGUIDANCE	0.75	NA	NA
SW8310	FLUORENE	N	UG/L	50	NYGUIDANCE	0.07	NA	NA
SW8310	INDENO[1,2,3-CD]PYRENE	N	UG/L	0.002	NYGUIDANCE	0.13	NA	NA
SW8310	PHENANTHRENE	N	UG/L	50	NYSTANDARD	0.5	NA	NA
SW8310	PYRENE	N	UG/L	50	NYGUIDANCE	0.61	NA	NA
SW8330	1,3,5-TRINITROBENZENE	N	UG/L	5	NYSTANDARD		NA	0.37
SW8330	2,4,6-TRINITROTOLUENE	N	UG/L	5	NYSTANDARD		NA	0.79
SW8330	4-AMINO-2,6-DINITROTOLUENE	N	UG/L				NA	2.4

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

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Table 5.6-7 Component 1, Former AFP-68 Process Areas 4, 7, 8, and 11 (East of Wesson Street), Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-4-GW-BP1
SW8081	GAMMA-BHC	N	UG/L	0	NYSTANDARD	0.0048
SW8081	HEPTACHLOR EPOXIDE	N	UG/L	0	NYSTANDARD	0.03

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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NYSDEC in surface soil collected from around the concrete foundation located adjacent to the northwest corner of the building located in Process Area 2 (Johnson 1999). These elevated PCBs are recommended for further investigation.

Process Area 4 should be further investigated to delineate the extent of PAHs in the surface and semi-subsurface soils.

It is recommended that Process Area 7 and 11 be further investigated to delineate the extent of PAHs in the surface and subsurface soil reported throughout the area. In addition, the elevated PCBs reported in samples collected from locations H100 and BP3 are recommended for further investigation.

Within Area 8, the elevated concentration of carbon tetrachloride reported in location E200 and the elevated PCB reported in F500 is recommended for further investigation. In addition, elevated PCBs were reported by the NYSDEC in surface soil collected from drains in the vicinity of E300 (Johnson 1999). These elevated PCBs are recommended for further investigation.

Although Process Area 20 has been used by CWM, the lithium concentration reported in the ground water from that area indicates a possible impact from former DOD activities. Because elevated boron or lithium were not reported in the semi-subsurface soil in that area, the potential COPC reported in the surface and semi-subsurface in Process Area 20 may not be from former DOD use. The COPC reported in the ground-water sample may be from an up gradient location. An investigation to delineate lithium impact and to evaluate the presence of a possible source is recommended. Also, the possible presence of other potential COPC associated with the elevated lithium should be evaluated.

The metals concentrations reported in the soil and ground-water samples collected from within Process Areas 4, 7, 8, and 11 appear to be indicative of site-specific background concentrations. However, a background metals concentration evaluation is recommended to more completely evaluate the reported metals concentrations.

5.6.2 Process Areas West of Wesson Street

Former AFP-68 process areas located west of Wesson Street include Process Areas 10, 14, 16, 18S, 22, and 24. The History Search Report and Work Plan contain detailed information on the processes at the former AFP-68. Summary descriptions are included in this section.

5.6.2.1 Site Background

Process Area 10

Photograph 5.6-5. Photograph looking south at Building 10-01. Sample location C1-10-SO-BP1 located at northeast corner.

Process Area 10 consists of an existing control building, an in-ground sewage pump, a 48-in. diameter dry well, and several overhead pipe support footers (Photograph 5.6-5). The area was used for the generation, purification, dehydration, and storage of hydrogen used in Process Area 3 and Process Area 5.

Process Area 14

Photograph 5.6-6. Photograph looking south/southwest at Building 16-01 in the foreground and Building 14-01 in the background.

Process Area 14 consists of a former steam plant and a bermed fuel oil containment structure that formerly contained a 500,000-gal, 40-ft diameter tank. The tank reportedly contained either Number 2 or Number 6 fuel oil before its decommissioning (Golder 1991). The tank was dismantled and moved by SCA in 1982 (Johnson 1999). The purpose of the steam plant was to provide process and heating steam for the other process areas. The building has been used by CWM and its predecessors for storage.

Process Area 16

Process Area 16 consists of a large 35-ft high steel frame building and included a chilled water refrigeration plant and a brine refrigeration plant (Photograph 5.6-6). CWM has used the building to store equipment.

Process Area 18

Process Area 18 consists of a former north tank farm (Area 18N), located on property currently owned by the Somerset Group (Component 2), and a former south tank farm (Area 18S), located on CWM property (Component 1). Liquid chemicals were unloaded from tank cars and stored in these areas. The tanks held dispersion oil, methanol, chlorine, cyclohexane, pentane, propane, isopropyl chloride/ethyl chloride, and number 2 fuel oil.

Process Area 22

Process Area 22 consists of an existing water treatment building, a chemical waste lift station, a water supply pond (concrete structure), and a pump house. This building is the southern portion of the steam building within Process Area 14. In the early 1970s, Chem-Trol and SCA used the water supply pond for storage of wastewater that was similar in constituents to that stored in Lagoons 1 through 5.

Process Area 24

Process Area 24 (Photograph 5.6-7) consists of a small control building, a concrete oil/water separator, a concrete acid neutralization lagoon, a chemical waste lift station, the remains of two vertical tanks, and three concrete platforms. The area was involved with wastewater treatment. In the early 1970s, Chem-Trol and SCA used the acid neutralization lagoon and the oil/water separator for storage of wastewater. The wastewater stored in the acid neutralization lagoon was reportedly similar to the wastewater in Lagoons 1 through 6.

Photograph 5.6-7. Photograph looking south at northeast corner of Building 24-04 and water-filled containment area.

5.6.2.2 Field Reconnaissance and Surface Features

Thick brush and remnant buildings, tank cradles, concrete holding tanks (lagoons), and foundations primarily characterize the area west of Wesson Street on AFP-68 of Component 1. The earthen berms around the tank farms in Process Areas 14 and 18 were still visible. B Ditch traverses the area, just north of the Process Area 16 building. The Central Drainage Ditch traverses the western edge of the area. The brush thins out in the southern portion of the area, in the vicinity of Process Areas 14, 22, and 24. A railroad is located south of Process Area 22 and 24, and west of Process Areas 14, 22, and 18S. A detailed description of the area is provided in the field reconnaissance performed by Acres (Acres 1988).

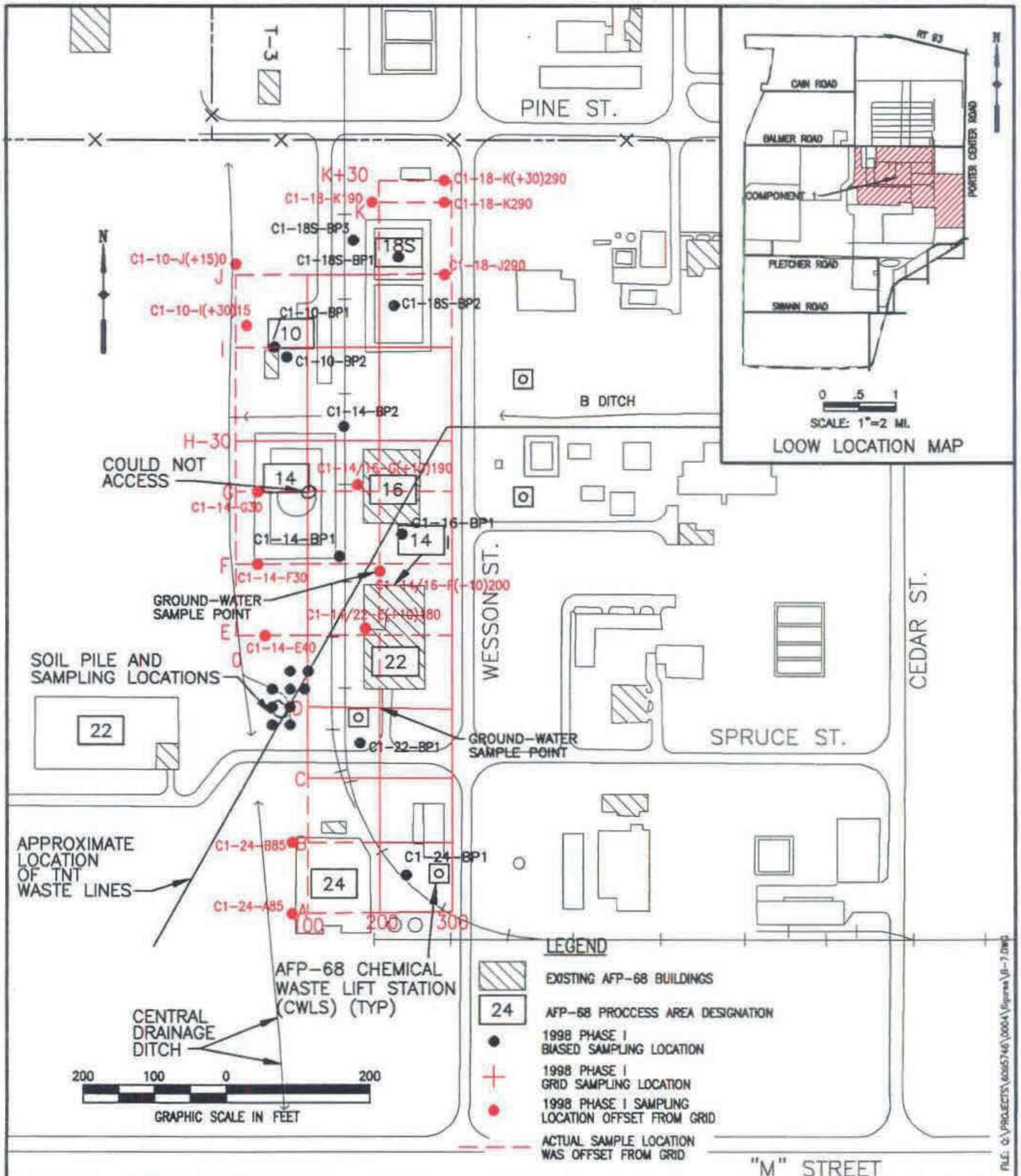
5.6.2.3 Soil Sampling Program

Field activities at former AFP-68 included collection of surface soil, subsurface soil, ground-water, surface water, and sediment samples. The soil sampling program is discussed herein. The ground-water sampling program is discussed in Section 5.6.2.7. The surface water and sediment sampling program are discussed in Chapter 13.

A soil sampling grid with an approximate 100-ft interval was established across the site (Figure 5.6-3). Grid points were given alpha-numeric designations, with A100 being the southwestern corner of the grid. Because A0, B0, and C0 would have been on the west side of the Central Drainage Ditch, out of the process areas, these locations were not sampled. In addition, the most western locations on rows E, F, and G were shifted to the east approximately 30 ft to avoid the Central Drainage Ditch. The sampling locations along the east west trending H row were shifted to the south (H-30) to avoid the B Ditch. Due to the layout of the process areas west of Wesson Street and the position of the Central Drainage Ditch, the sampling grid is widest in the central area and narrower in the northern and southern portions. The grid extends 1,050 ft to row K(+30) to the north and, at its widest point, 300 ft to the east, for a total of 40 grid locations. Due to its inaccessible location within the berm of the former AST of Process Area 14, location G100 was not drilled. A subsurface sample was not collected from A200.

Additional points were installed in a 25-ft grid interval around the TNT waste line excavation just west of D100. Sampling was performed in an attempt to delineate possible PCB reported during the excavation of the TNT waste line during the Remedial Design Investigation (Weston 1997a).

In addition, 10 biased sampling locations were established within the grid. Table 5.6-8 details the biased point sample locations and rationale behind their placement.



EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

COMPONENT 1 (CWM)
PROCESS AREAS 10, 14, 16, 18S, 22 AND 24
SAMPLING GRID LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	DLR	FDV	SMS	AS SHOWN	JULY 1999	60957.46	5.6-3

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TABLE 5.6-8 BIASED SAMPLING POINT RATIONALE

Biased Sampling Point	Rationale Behind Placement
C1-10-SO-BP1	Located in the northeast corner of the control building in the area of an overturned drum.
C1-10-SO-BP2	Adjacent to a 48-in. diameter dry well.
C1-14-SO-BP1	Adjacent to the railroad track, at the southeast corner of the tank berm, just down gradient from where the former LOOW TNT waste line traverses the area.
C1-14-SO-BP2	Adjacent to the railroad track, at the northeast corner of the tank berm.
C1-16-SO-BP1	Along the southern portion of the Process Area 16 control building, in an area of ground staining.
C1-18-SO-BP1	Within the northern portion of the bermed tank farm. This is an area historically reported to have elevated total VOCs and SVOCs (Acres 1992).
C1-18-SO-BP2	Within the southern portion of the bermed tank farm. This is an area historically reported to have elevated total VOCs and SVOCs (Acres 1992).
C1-18-SO-BP3	Adjacent to the railroad tracks, west of the tank farm
C1-22-SO-BP1	Placed adjacent to the railroad tracks, just north of Spruce Street, in Process Area 22.
C1-24-SO-BP1	Between the two wastewater lagoons, and adjacent to the railroad tracks, in Process Area 24.

Direct push technology was used to perform sampling at each grid and biased point location. Generally, surface soil samples, ranging in depth from 0 to 1 ft bgs, semi-subsurface soil samples, ranging in depth from 2 to 3.5 ft bgs, and a subsurface soil samples, ranging in depth from 4.3 to 13.5 ft bgs were collected from each location. Soil samples were used to describe site stratigraphy and were field screened for VOCs, PAHs, PCB, and TNT.

Soil screening results were evaluated, and locations exhibiting elevated concentrations of COPC were revisited. Additional samples were collected, screened, and submitted for confirmatory laboratory analysis as discussed in Sections 5.6.2.5 and 5.6.2.6.

5.6.2.4 Site Stratigraphy

A representative cross-section of the area west of Wesson Street is included as Figure 5.6-4.

Surface Soil

Surface soil encountered in the grid located west of Wesson Street generally consisted of dry, clayey silt (ML), with some fine sand. Occasionally, the surface soil was classified as UCT, or as fine sand. In wooded areas, the upper 0.5 to 1 ft were highly organic and moist.

Due to past use, it is expected that the surface soil has been altered through grading, particularly in the immediate vicinity of buildings (i.e., Process Areas 14, 22, etc.). Upper clay till (UCT) was generally encountered 2 to 4 ft bgs, immediately below the silt layer. Fill material was occasionally encountered, but was not a major component of the subsurface strata.

Subsurface Stratigraphy

Subsurface stratigraphy was generally characterized by UCT, with laminations or thin lenses (less than 3 in.) of silt, fine sand, and gravel. GLC was encountered at several borings in the southern portion of the grid, from 12 to 19 ft bgs. However, most borings were terminated in dry to moist UCT between 10 to 14 ft bgs.

In general, very little water was reported in subsurface strata within the grid west of Wesson Street. The moist-to-wet UST was present, but apparently was very discontinuous. Four areas of water-bearing strata may be inferred from the borings:

1. A thick SM/ML layer at was reported at A300. A mixture of fine sand/silt was reported from the surface to 10 ft bgs, becoming saturated around 8 ft bgs. Clay was not encountered in the boring until 14 ft bgs, where the SM/ML began to be interbedded with clay. The absence of UCT between 2 to 10 ft bgs was very unusual for the grid and the entire LOOW site, and suggests that excavation may have occurred in this area in the past. Adjacent borings were dry/moist UCT, with the exception of B200 (8 to 9.7 ft bgs) and C100, at 12 to 13.5 ft bgs. Both of these borings were characterized by UCT either above or below the wet lenses (B200 was a lithologic boring) suggesting that A300 is anomalous and that the ground water in the southern half of the grid exists in very discontinuous, narrow lenses. Potential leakage from a large water-filled concrete tank (Process Area 24) may also affect the distribution of water in the borings performed at the southern end of the grid.

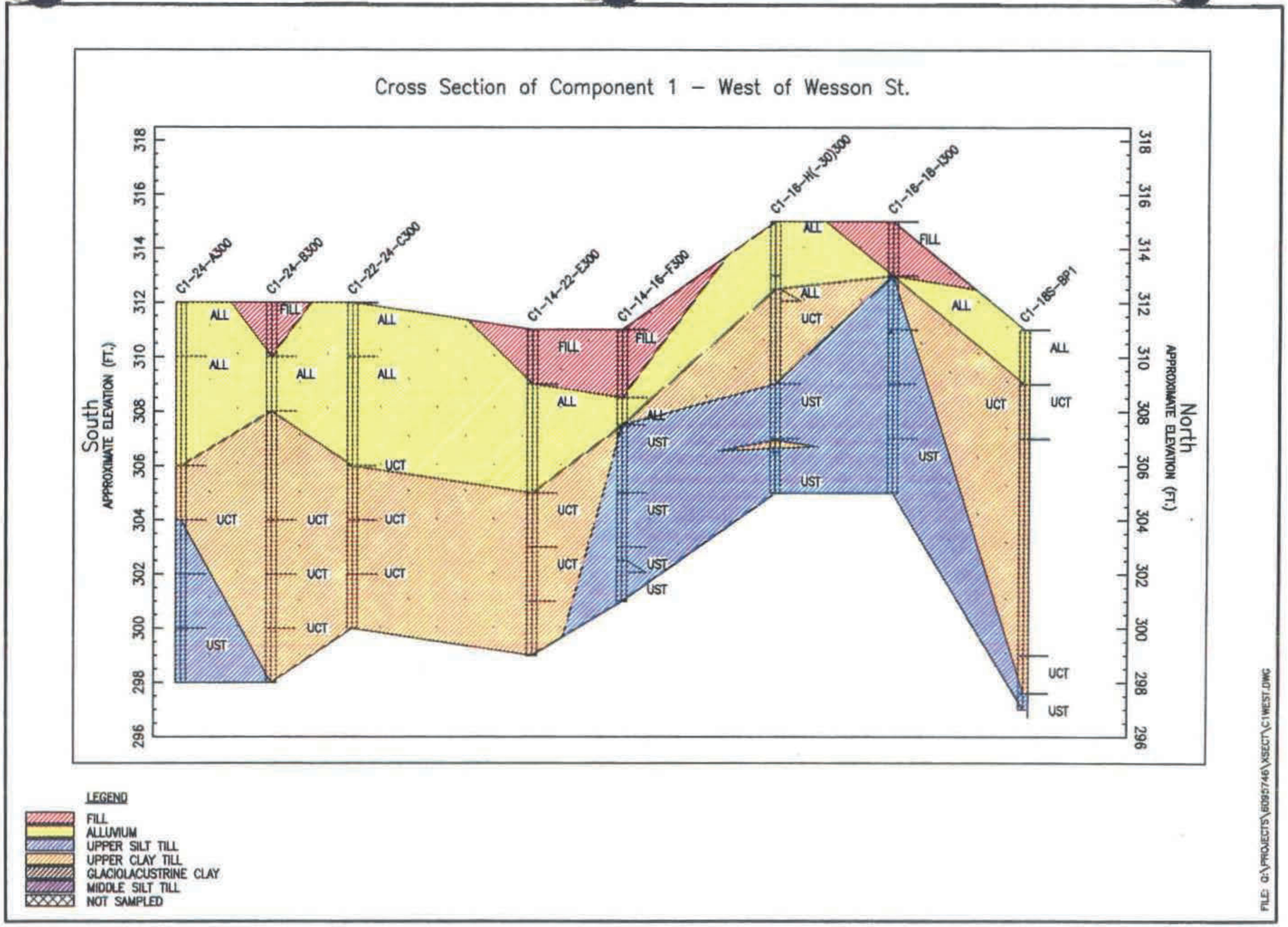
Cross Section of Component 1 - West of Wesson St.
South
APPROXIMATE ELEVATION (FT.)
North
APPROXIMATE ELEVATION (FT.)
318
316
314
312
310
308
306
304
302
300
298
296
C1-24-A300
C1-24-B300
C1-22-24-C300
C1-14-22-E300
C1-14-16-F300
C1-16-H(-30)300
C1-16-18-I300
C1-18S-BP1
FILL
ALL
UCT
UST
LEGEND
FILL
ALLUVIUM
UPPER SILT TILL
UPPER CLAY TILL
GLACIOLACUSTRINE CLAY
MIDDLE SILT TILL
NOT SAMPLED
FILE: G:\PROJECTS\6095746\XSECT\C1WEST.DWG

FIGURE 5.6-4

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2. Silt and fine sand (SM/ML) were reported from the surface to approximately 12 ft bgs in three of borings located adjacent to Building 14/22 (D300, F200, and F300). A very saturated "running sand" slurry was reported in F200 and F300. In a fourth well, D200, UCT was reported to 14 ft bgs in the initial boring. When a second boring was performed for the collection of laboratory analytical samples, a thick black slurry was reported from 4 to 9 ft bgs, with UCT and gravel from 9 to 11 ft bgs. The sharp discontinuity suggests that these boring locations were once excavated for the construction of the building, and the excavated soil returned in place, after having been broken.

3. Silt (ML) was generally reported from the surface to 9 or 10 ft bgs in the 300 row borings (G through K(+30), excluding K300), located along Wesson Street. It is not known if this layer is an extension of the SM/ML reported in the F row, but two characteristics are different: slurry was not reported north of F row, and the samples to the north were occasionally interbedded with UCT. The silt layer, however, was wet/saturated, and likely continuous between this set of borings. Continuity of this lens to the west (200 row) was not well characterized, as samples were collected too deep (12 to 14 ft bgs) to assess the areal extent.

4. A deeper silt/gravel lens (12 to 14 ft bgs) was reported in borings performed in the northwestern corner of the grid (K200 through I100). These layers were generally thin (approximately 1 ft), and may or may not be continuous. Thin, fine sand, silt, or gravel lenses were a common feature encountered near the bottom of the upper glacial till unit.

5.6.2.5 Soil Screening Results

Soil screening results for samples collected at each process area are included in Tables 5.6-9 and 5.6-10.

<u>Process Area 10</u>

VOCs were reported in field-screening results, but at concentrations that did not exceed the NY State comparison criteria. TNT and PCB were not reported in field-screening samples.

PAHs were reported in each sample submitted for field screening. The reported total PAH concentrations of the surface soil sample from J(+15)0 exceeded the NY State comparison criteria of 10,000 μg/kg for total carcinogenic SVOCs. The reported concentration for this location was 11,045 µg/kg. In addition, concentrations of total PAHs reported in samples collected from I100 and J100 exceeded 1/10th of the comparison criteria.

Process Area 14

VOCs and PAHs were reported in field-screening samples, but at levels which did not exceed screening criteria. TNT was not reported in field-screening samples.

PCB were reported at a concentration of 460 µg/kg in the surface-soil sample collected from location 14-BP1. However, this result does not exceed total PCB screening criteria for surface soils of 1,000 µg/kg.

Process Area 16

VOCs were reported in field-screening results, but at concentrations that did not exceed the NY State comparison criteria. TNT was not reported in field-screening samples.

PAHs were reported in each sample submitted for field screening. The reported total PAH concentrations of the surface-soil samples from G300 and H(-30)300 exceeded the NY State comparison criteria. The reported concentrations for these locations were 10,842 µg/kg and 18,882 µg/kg, respectively. Additional locations reported concentrations of total PAHs exceeding 1/10th of the comparison criteria.

PCB (600 µg/kg) were reported in the surface soil sample collected from 16-BP1. The reported concentration exceeded 1/10th of the comparison criteria.

Process Area 18

VOCs and PAHs were reported in field-screening results, but at concentrations that did not exceed the NY State comparison criteria. However, the reported concentration of PAHs in samples collected from locations I300, K(+30)200, BP2 and BP3 exceeded 1/10th of the comparison criteria. TNT and PCB were not reported in field-screening samples.

Process Area 22

VOCs and PAHs were reported in field-screening results, but at concentrations that did not exceed the NY State comparison criteria. However, PAH concentrations reported in samples collected from locations C(+75)75, D(+25)50, D(+50)100, D(-3)300, D50 and D75 exceeded 1/10th of the comparison criteria. TNT was not reported in field-screening samples.

PCB were reported at concentrations exceeding the NY State comparison criteria in surface soil samples collected from D75 and D100. These sample locations are shared with Process Area 24. The highest concentration of PCB, 8,000 μg/kg, was reported in location D100 at 0.3 to 0.8 ft bgs. These results exceed the NY State total PCB comparison criteria for surface soils. PCB were also reported in C(+75), D(+25), D(-3)300, and D200 below screening criteria. Locations D75, C(+75), and D(+25) were part of the 25-ft interval grid to evaluate the presence of PCB in the vicinity of the TNT waste line excavation conducted by Weston (1997a).

<u>Process Area 24</u>

VOCs and PAHs were reported in field-screening results, but at concentrations that did not exceed screening criteria. PAH concentrations reported in samples collected from locations C100, C200, C300, A200, A85, B200, B300, B85, and BP1 exceeded 1/10th of the NY State comparison criteria. TNT was not reported in field screening samples.

PCB were reported at concentrations exceeding the NY State comparison criteria samples collected from A85, A200, B300, 24-BP1, and C200. The highest concentration of PCB, 17,200 μg/kg, was reported in location A200 at 0.1 to 0.6 ft bgs. PCB were also reported in the sample collected from location B85 in concentrations that exceeded 1/10th of the comparison criteria.

5.6.2.6 Laboratory Analyses and Confirmatory Soil Sample Results

Soil screening results for confirmatory samples are included in Tables 5.6-9 and 5.6-10. Laboratory analytical sample results for confirmatory samples are included in Tables 5.6-11 and 5.6-12. Analytes concentrations that exceed 1/10th of the NY State comparison criteria have been lightly shaded. Those concentrations exceeding the full value of the criteria have been darkly shaded.

<u>Process Area 10</u>

Due to the reported presence of VOCs and slightly elevated PAH concentrations, I100 was revisited. A sample from the target interval was re-collected and submitted for confirmatory laboratory analysis of full TCL/TCL analytes, boron, lithium, and explosives. The sample was inadvertently not re-screened VOCs, PAHs, PCB, or TNT.

In the laboratory results several pesticides, PAHs, and bis(2-ethylhexyl)phthalate were reported in concentrations below the NY State comparison criteria. However, the reported concentrations of benzo[a]pyrene and dibenz[a,h]anthracene exceeded $1/10^{th}$ of the comparison criteria. The reported concentrations of iron and zinc exceeded the NY State comparison criteria. Additional metals exceeded $1/10^{th}$ of the comparison criteria. However, because the laboratory reported that the spiked sample recovery for zinc was not within control limits, the result is potentially biased.

Process Area 14

Due to the reported presence of VOCs at 14-BP2 and the likelihood of the presence of potential COPC at F(-10)200 (shared location with Process Area 16), these sample locations were revisited. Samples from the target interval were re-collected, re-screened, and submitted for confirmatory laboratory analysis of DOD marker compounds.

In the field screening results for the re-collected sample from 14-BP2 at 10 ft bgs, VOCs and PAHs were reported, but at concentrations below $1/10^{th}$ of the NY State comparison criteria. TNT and PCB were not reported. Boron and lithium were reported in the laboratory results. Explosives were not reported.

In the field screening results for the re-collected sample from F(-10)200 at 6 ft bgs, VOCs, TNT, and PCB were not reported. PAHs were reported at concentrations exceeding $1/10^{th}$ of the NY State comparison criteria. In the results for the laboratory sample from the same location lithium and boron (estimated) were reported. Explosives were not reported.

During the 1992 PCA, Acres collected 3 surface soil samples within the bermed tank containment area. VOCs, with the exception of acetone, were not reported. Low level SVOCs and PAHs were reported. PCB (Aroclor 1254) was detected in each of the 3 samples. However, because the tank from within this bermed area was dismantled and reused by CWM, the berm and the area within the berm were not eligible for investigation under this HTRW project.

Process Area 16

Due to the reported presence of VOCs and elevated PAHs at H300 and the likelihood of the presence of COPC at F(-10)200 (shared location with Process Area 14), these sample locations were revisited. Additional samples were re-collected, re-screened, and submitted for confirmatory laboratory analysis of DOD marker compounds from the target interval. Sample results for F(-10)200 are discussed above under Process Area 14. In order to obtain additional confirmatory analysis for the PAH field screening results, the sample collected from H300 was also submitted for laboratory analysis of PAHs.

In the field screening results for the re-collected sample from H300 at 1 ft bgs, VOCs and PAHs were reported at concentrations below the NY State comparison criteria. However, the reported PAH concentration exceeded $1/10^{th}$ of the comparison criteria. TNT and PCB were not reported. In the laboratory results for the same sample, lithium and boron (estimated) were reported. Bis(2-ethylhexyl)phthalate and PAHs were also reported at concentrations below the NY State comparison criteria. However the reported concentrations of benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, and dibenz[a,h]anthracene exceeded $1/10^{th}$ of the comparison criteria.

Process Area 18

Due to the likelihood of the presence of ground water and its location downgradient of the former Area 18S tank farm, K190 (subsurface) was revisited. Additional samples from the target interval were re-collected, re-screened, and submitted for confirmatory laboratory analysis of full TCL/TAL analytes, boron, lithium, and explosives.

In the field screening results for the re-collected sample, VOCs, TNT, and PCB were not reported. PAHs were reported at concentrations below $1/10^{th}$ of the NY State comparison criteria. In the laboratory results, iron exceeded the comparison criteria. Heptachlor, heptachlor epoxide, and PAHs were reported below $1/10^{th}$ of the comparison criteria.

Process Area 22

Due to the reported presence of VOCs at D200 and elevated PCB at C200 (shared location with Process Area 24), these sample locations were revisited. Additional samples were re-collected from the target interval, re-screened, and submitted for confirmatory laboratory analysis of DOD marker compounds. In order to obtain additional confirmatory analysis for the PCB field screening results, the sample collected from C200 was also submitted for laboratory analysis of PCB.

The field screening results for the re-collected sample from D200 at 9 ft bgs reported VOCs and PAHs and concentrations below the NY State comparison criteria. However, the total PAH concentration exceeded 1/10th of the comparison criteria. TNT and PCB were not reported. The laboratory results for the same sample reported lithium and boron (estimated). Explosives were not reported in the laboratory results for the sample collected from D200.

VOCs, TNT, and PCB were not reported in the field screening results for the re-collected from C200 at 1 ft. PAHs were reported at concentrations below the NY State comparison criteria. However, the reported PAH concentration exceeded 1/10th of the comparison criteria. The results for the laboratory analysis reported lithium and boron (estimated). Aroclor 1248 was also reported in concentrations below 1/10th of the comparison criteria. The reported concentration of Aroclor 1248 was also below the detection limit for the PCB field screening analysis. Explosives were not reported.

Process Area 24

One sample for laboratory analysis was collected from within Process Area 24. The sample was collected from location of A85 due to the fact that this location was adjacent to the former AFP-68 lagoon. Another sample was collected from C200 (shared location with Process Area 22), but this location is on the periphery of Area 24. Sample results for C200 are discussed above under Process Area 22. The sample collected from A85 was re-screened and submitted for confirmatory laboratory analysis of DOD marker compounds.

The field screening results for the re-collected sample from A85 at 10 ft bgs reported VOCs at concentrations below 1/10th of the NY State comparison criteria. The reported total PAH concentration exceeded the NY State comparison criteria of 10,000 µg/kg for total carcinogenic SVOCs. The reported total PAH concentration for A85 was 17,656 µg/kg. PCB were reported at 10,600 µg/kg, which exceeds the subsurface comparison criteria for total PCB of 10,000 µg/kg. PCB were not reported in the original sample collected from this location. TNT was not reported. In the results for the laboratory analysis of the same sample, lithium and boron (estimated) were reported. Explosives were not reported.

5.6.2.7 Ground-Water Sampling Program and Results

Due to the presence and concentration of COPC in field-screening and the stratigraphy indicating the presence of a water-bearing zone, 1-in. temporary ground-water sampling points were installed at grid locations D200 in Process Area 22 and A85 in Process Area 24. A 2-in. point was installed at F200 in Process Areas 14/16. Due to its inability to produce sufficient ground water, the well point at A85 was not sampled. The screening interval at D200 was between 4 to 9 ft bgs and included a lens of mostly gravel, while the screening interval at F200 was between 7 to 12 ft bgs and included a lens of wet silt till. The ground-water sample collected from D200 was analyzed for DOD marker compounds. The sample collected from F200 was analyzed for full TCL/TAL analytes, boron, lithium, and explosives.

Boron and lithium were reported in total and dissolved fractions in the ground-water sample collected at D200. The reported concentration of boron exceeded 1/10th of the NY State ground-water comparison criteria. Explosives were not reported in the ground-water sample collected from D200.

The results for the sample collected from F200 reported concentrations of magnesium and sodium exceeding the NY State comparison criteria. The pesticide alpha BHC was reported above the screening criteria of 0 μg/L. However, the laboratory reported that a greater than 25 percent difference between detector columns was observed during analysis. Therefore the result for α-BHC may be biased. Acetone was reported in concentrations that did not exceed the comparison criteria. However the reported acetone concentration exceeded 1/10th of the comparison criteria. SVOCs, PAHs, PCB, cyanide, and explosives were not reported. A summary of reported analytes is presented in Tables 5.6-13 and 5.6-14.

5.6.2.8 Conclusions and Recommendations

Further investigation of Process Area 10 is recommended to delineate the extent of PAHs reported in the soil.

Although PAHs were reported in the subsurface soil collected from Area 18S, the concentrations did not exceed the NY State comparison criteria. In addition, other than trace concentrations of VOCs, no other potential COPCs were reported within Area 18S. Therefore, this area is not recommended for further investigation.

Due to the tank removal performed by CMW, and the storage of pitch within Building 14-01, Area 14 is not eligible for further investigation under this HTRW project.

Due to the storage of CWM equipment within Area 16 and the storage of pitch adjacent to Area 16 by CMW, this area is not eligible for further investigation under this HTRW project.

Due to the use of the containment structures within Areas 22 and 24 by CWM to store wastewater, these areas are not eligible for further investigation under this HTRW project.

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-10-SO-BP1-13.5-14.0	C1-10-SO-BP1-3.5-4.0	C1-10-SO-BP2-0.0-0.5	C1-10-SO-BP2-3.5-4.0	C1-10-SO-I(+30)15-0.0-0.5	C1-10-SO-I(+30)15-11.5-12.0	C1-10-SO-I(+30)15-2.0-2.5	C1-10-SO-I100-0.0-0.5	C1-10-SO-I100-13.5-14.0	C1-10-SO-I100-13.5-14.0-DUP	C1-10-SO-I100-3.5-4.0	C1-10-SO-J(+15)-0.0-0.5	C1-10-SO-J(+15)-0.0-0.5-DUP
E4020	PCB	UG/KG	1000	NYTAGM											NA			
E4035	PAH	UG/KG	10000	NYTAGM	1248	626	748	862	459	830	863	961	4059	1682	NA	860	9607	11045
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM									0.07	0.11	0.12			NA
GC	BENZENE	UG/KG	60	NYTAGM														NA
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM									0.06					NA
GC	M & P-XYLENES	UG/KG	1200	NYTAGM									6.21					NA
GC	O-XYLENE	UG/KG	1200	NYTAGM									18.62					NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM							3.97	0.64	1.75					NA
GC	TOLUENE	UG/KG	1500	NYTAGM						0.31			1.01	0.47	0.34			NA
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM								0.31	0.12					NA
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM														NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-10-SO-J(+15)-13.5-14.0	C1-10-SO-J(+15)0-3.5-4.0	C1-10-SO-J100-0.0-0.5	C1-10-SO-J100-13.5-14.0	C1-10-SO-J100-3.5-4.0	C1-10-SO-J100-3.5-4.0-DUP	C1-10/14-SO-H(-30)0-0.0-0.5	C1-10/14-SO-H(-30)0-0.0-0.5DUP	C1-10/14-SO-H(-30)0-11.5-12.0	C1-10/14-SO-H(-30)0-3.5-4.0	C1-10/14-SO-H(-30)100-0.0-0.5	C1-10/14-SO-H(-30)100-11.5-12.	C1-10/14-SO-H(-30)100-3.5-4.0
E4020	PCB	UG/KG	1000	NYTAGM									NA					
E4035	PAH	UG/KG	10000	NYTAGM	1248	477	144	2157	1178	1361	1626	933	341	255	128	155	313	154
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM							NA							
GC	BENZENE	UG/KG	60	NYTAGM				1.71			NA							
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				1.46			NA							
GC	M & P-XYLENES	UG/KG	1200	NYTAGM							NA							
GC	O-XYLENE	UG/KG	1200	NYTAGM							NA							
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				0.56			NA							
GC	TOLUENE	UG/KG	1500	NYTAGM							NA							
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM							NA							
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM				1.64			NA							

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = r [illegible] 'ected

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-10/16-SO-H(-30)200-0.0-0.5	C1-10/16-SO-H(-30)200-13.5-14.	C1-10/16-SO-H(-30)200-3.5-4.0	C1-10/16-SO-H(-30)200-3.5-4DUP	C1-10/16/18-SO-I200-0.0-0.5	C1-10/16/18-SO-I200-10.0-10.5	C1-10/16/18-SO-I200-2.0-2.5	C1-10/18-SO-J200-0.0-0.5	C1-10/18-SO-J200-0.0-0.5-DUP	C1-10/18-SO-J200-12.0-12.4	C1-10/18-SO-J200-12.0-12.4-DUP	C1-10/18-SO-J200-2.2-2.7	C1-14-SO-BP1-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM												NA		460
E4035	PAH	UG/KG	10000	NYTAGM	1248	544	575	263	NA	724	612	304	325	311	822	NA	287	834
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA									0.41
GC	BENZENE	UG/KG	60	NYTAGM					NA									
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA									
GC	M & P-XYLENES	UG/KG	1200	NYTAGM					NA									
GC	O-XYLENE	UG/KG	1200	NYTAGM					NA									
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM					NA									
GC	TOLUENE	UG/KG	1500	NYTAGM					NA									
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM					NA									1.51
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM					NA									0.61

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-14-SO-BP1-0.0-0.5-DUP	C1-14-SO-BP1-11.5-12.0	C1-14-SO-BP1-3.5-4.0	C1-14-SO-BP2-0.5-1.0	C1-14-SO-BP2-10-REP	C1-14-SO-BP2-10.5-11.0	C1-14-SO-BP2-10.5-11.0-DUP	C1-14-SO-BP2-2.0-2.5	C1-14-SO-E40-0.4-0.9	C1-14-SO-E40-2.2-2.7	C1-14-SO-E40-2.2-2.7-DUP	C1-14-SO-E40-4.2-4.7	C1-14-SO-E40-4.2-4.7-DUP
E4020	PCB	UG/KG	1000	NYTAGM		NA						NA						NA
E4035	PAH	UG/KG	10000	NYTAGM	1248	830	1625	139	586	520	391	NA	354	86	359	154	375	NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		NA										NA		
GC	BENZENE	UG/KG	60	NYTAGM		NA										NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		NA										NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM		NA										NA		
GC	O-XYLENE	UG/KG	1200	NYTAGM		NA										NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		NA										NA		
GC	TOLUENE	UG/KG	1500	NYTAGM		NA										NA		
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM		NA				0.66	2.42	3.53				NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		NA				4.02	11.76	16.02				NA	1.16	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = r 'ected

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-14-SO-F100-0.4-0.9	C1-14-SO-F100-2.1-2.6	C1-14-SO-F100-4.8-5.3	C1-14-SO-F30-0.5-1.0	C1-14-SO-F30-2.0-2.5	C1-14-SO-F30-4.3-4.8	C1-14-SO-G30-0.0-0.4	C1-14-SO-G30-0.0-0.4-DUP	C1-14-SO-G30-3.0-3.5	C1-14-SO-G30-8.0-8.5	C1-14/16-SO-(G10)G190-0.0-0.5	C1-14/16-SO-(G10)G190-13.5-14.	C1-14/16-SO-(G10)G190-3.5-4.0	C1-14/16-SO-F(-10)200-0.1-0.6
E4020	PCB	UG/KG	1000	NYTAGM									NA						
E4035	PAH	UG/KG	10000	NYTAGM	1248	99	182	269	1039	2956	294	554	NA	180	674	264	931	359	3296
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM														0.09	
GC	BENZENE	UG/KG	60	NYTAGM															
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM															
GC	M & P-XYLENES	UG/KG	1200	NYTAGM															
GC	O-XYLENE	UG/KG	1200	NYTAGM														9.17	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM															
GC	TOLUENE	UG/KG	1500	NYTAGM												0.03			
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM															
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM				1.02								0.03			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-14/16-SO-F(-10)200-0.1-0.6D	C1-14/16-SO-F(-10)200-2.4-2.9	C1-14/16-SO-F(-10)200-6.7-7.2	C1-14/16-SO-F200-6-REP	C1-14/16-SO-F300-0.1-0.6	C1-14/16-SO-F300-2.7-3.2	C1-14/16-SO-F300-9.2-9.7	C1-14/22-SO-E(+10)180-0.0-0.5	C1-14/22-SO-E(+10)180-0.0-0.5D	C1-14/22-SO-E(+10)180-13.5-14.	C1-14/22-SO-E(+10)180-3.5-4.0	C1-14/22-SO-E100-0.2-0.7	C1-14/22-SO-E100-2.5-3.0
E4020	PCB	UG/KG	1000	NYTAGM										NA				
E4035	PAH	UG/KG	10000	NYTAGM	1248	4123	719	650	1302	4459	156	339	1197	1317	1015	602	279	381
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		NA								NA				
GC	BENZENE	UG/KG	60	NYTAGM		NA								NA				
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		NA								NA				
GC	M & P-XYLENES	UG/KG	1200	NYTAGM		NA								NA				
GC	O-XYLENE	UG/KG	1200	NYTAGM		NA								NA				
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		NA								NA				
GC	TOLUENE	UG/KG	1500	NYTAGM		NA								NA				
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM		NA								NA				
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		NA								NA				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = r [illegible]cted

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-14/22-SO-E100-8.2-8.7	C1-14/22-SO-E300-0.3-0.8	C1-14/22-SO-E300-2.7-3.2	C1-14/22-SO-E300-8.5-9.0	C1-16-SO-BP1-0.0-0.5	C1-16-SO-BP1-13.5-14.0	C1-16-SO-BP1-3.5-4.0	C1-16-SO-BP1-3.5-4.0-DUP	C1-16-SO-G300-0.0-0.5	C1-16-SO-G300-2.0-2.5	C1-16-SO-G300-6.4-6.9	C1-16-SO-G300-6.4-6.9-DUP	C1-16-SO-H(-30)300-0.1-0.6
E4020	PCB	UG/KG	1000	NYTAGM						600			NA					
E4035	PAH	UG/KG	10000	NYTAGM	1248	237	1602	501	240	7709	1268	511	NA	10842	5485	762	NA	18882
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM														
GC	BENZENE	UG/KG	60	NYTAGM														
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM														
GC	M & P-XYLENES	UG/KG	1200	NYTAGM														
GC	O-XYLENE	UG/KG	1200	NYTAGM														
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM														
GC	TOLUENE	UG/KG	1500	NYTAGM										5.38	5.37	4.21		7.34
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM														
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM														

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-16-SO-H(-30)300-3.0-3.5	C1-16-SO-H(-30)300-6.3-6.8	C1-16-SO-H300-1-REP	C1-16-SO-H300-1.0-DUP	C1-16/18-SO-I300-0.0-0.4	C1-16/18-SO-I300-2.0-2.5	C1-16/18-SO-I300-7.0-7.5	C1-18-SO-J290-0.1-0.6	C1-18-SO-J290-2.0-2.5	C1-18-SO-J290-8.8-9.3	C1-18-SO-K(+30)200-0.0-0.5	C1-18-SO-K(+30)200-2.0-2.5	C1-18-SO-K(+30)200-9.2-9.7
E4020	PCB	UG/KG	1000	NYTAGM														
E4035	PAH	UG/KG	10000	NYTAGM	1248	453	962	1170	1286	2051	1391	412	830	329	581	1447	278	276
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA									
GC	BENZENE	UG/KG	60	NYTAGM					NA									
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA						2.27			
GC	M & P-XYLENES	UG/KG	1200	NYTAGM					NA									
GC	O-XYLENE	UG/KG	1200	NYTAGM					NA									
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				1.4	NA									
GC	TOLUENE	UG/KG	1500	NYTAGM		5.59			NA									
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM					NA									
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		1.62		1.3	NA									

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-18-SO-K(+30)290-0.0-0.5	C1-18-SO-K(+30)290-0.0-0.5-DUP	C1-18-SO-K(+30)290-3.0-3.5	C1-18-SO-K(+30)290-8.0-8.5	C1-18-SO-K190-0.1-0.6	C1-18-SO-K190-11.2-11.7	C1-18-SO-K190-2.0-2.5	C1-18-SO-K290-0.0-0.5	C1-18-SO-K290-2.0-2.5	C1-18-SO-K290-9.4-9.9	C1-18S-SO-BP1-0.0-0.5	C1-18S-SO-BP1-0.0-0.5-DUP	C1-18S-SO-BP1-13.5-14.0
E4020	PCB	UG/KG	1000	NYTAGM														
E4035	PAH	UG/KG	10000	NYTAGM	1248	991	900	765	822	428	464	349	560	602	742	642	632	497
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM			NA						0.03	0.2			NA	
GC	BENZENE	UG/KG	60	NYTAGM			NA										NA	
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM			NA		1.57								NA	
GC	M & P-XYLENES	UG/KG	1200	NYTAGM			NA										NA	
GC	O-XYLENE	UG/KG	1200	NYTAGM			NA										NA	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM			NA										NA	
GC	TOLUENE	UG/KG	1500	NYTAGM			NA						1.92		0.17		NA	
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM			NA										NA	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			NA						0.04		0.81		NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-9 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-BP1-0.0-0.5	C1-18S-SO-BP1-3.5-4.0	C1-18S-SO-BP2-0.0-0.5	C1-18S-SO-BP2-0.0-0.5-DUP	C1-18S-SO-BP2-11.5-12.0	C1-18S-SO-BP2-3.5-4.0	C1-18S-SO-BP3-0.0-0.5	C1-18S-SO-BP3-13.5-14.0	C1-18S-SO-BP3-3.5-4.0	C1-18S-SO-K190-13.5-14.0-REP
E4020	PCB	UG/KG	1000	NYTAGM										
E4035	PAH	UG/KG	10000	NYTAGM	1248	708	362	404	1147	484	1638	1233	437	430
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM				NA						
GC	BENZENE	UG/KG	60	NYTAGM				NA						
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA						
GC	M & P-XYLENES	UG/KG	1200	NYTAGM				NA						
GC	O-XYLENE	UG/KG	1200	NYTAGM				NA						
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				NA						
GC	TOLUENE	UG/KG	1500	NYTAGM				NA						
GC	TRANS-1,2-DICHLOROETHE	UG/KG	300	NYTAGM				NA						
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM				NA						

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.6-10 Component 1, Former AFP-68 Process Areas 22 and 24 (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-22-SO-BP1-0.0-0.5	C1-22-SO-BP1-0.0-0.5-DUP	C1-22-SO-BP1-12.0-12.5	C1-22-SO-BP1-2.0-2.5	C1-22-SO-C(+75)50-0.0-0.5	C1-22-SO-C(+75)50-0.0-0.5-DUP	C1-22-SO-C(+75)50-13.5-14.0	C1-22-SO-C(+75)50-3.5-4.0	C1-22-SO-C(+75)50-3.5-4.0-DUP	C1-22-SO-C(+75)75-0.0-0.5	C1-22-SO-C(+75)75-0.0-0.5-DUP	C1-22-SO-C(+75)75-13.5-14.0	C1-22-SO-C(+75)75-3.5-4.0	C1-22-SO-D(+25)50-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM						NA		320	NA	660	480			
E4035	PAH	UG/KG	10000	NYTAGM	665	708	343	112	689	819	211	767	NA	1023	NA	514	179	343
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE									NA		NA			
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		NA				NA					NA			
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM		NA				NA					NA			
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		NA				NA					NA			
GC	M & P-XYLENES	UG/KG	1200	NYTAGM		NA				NA					NA			
GC	O-XYLENE	UG/KG	1200	NYTAGM		NA				NA					NA			
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		NA				NA					NA			
GC	TOLUENE	UG/KG	1500	NYTAGM		NA				NA					NA			
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		NA				NA					NA			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-10 Component 1, Former AFP-68 Process Areas 22 and 24 (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-22-SO-BP1-0.0-0.5	C1-22-SO-D(+25)50-13.5-14.0	C1-22-SO-D(+25)50-3.5-4.0	C1-22-SO-D(+25)50-3.5-4.0-DUP	C1-22-SO-D(+25)75-0.0-0.5	C1-22-SO-D(+25)75-0.0-0.5-DUP	C1-22-SO-D(+25)75-13.5-14.0	C1-22-SO-D(+25)75-3.5-4.0	C1-22-SO-D(+25)95-0.0-0.5	C1-22-SO-D(+25)95-13.5-14.0	C1-22-SO-D(+25)95-13.5-14.0DUP	C1-22-SO-D(+25)95-3.5-4.0	C1-22-SO-D(+50)100-0.0-0.5	C1-22-SO-D(+50)100-0.0-0.5-DUP
E4020	PCB	UG/KG	1000	NYTAGM									280		NA			
E4035	PAH	UG/KG	10000	NYTAGM	665	407	214		1308	NA	545	398	834	386	NA	567	6962	NA
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE						NA					NA			NA
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM				NA		NA						1.02		NA
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM				NA		NA								NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA		NA								NA
GC	M & P-XYLENES	UG/KG	1200	NYTAGM				NA		NA								NA
GC	O-XYLENE	UG/KG	1200	NYTAGM				NA		NA								NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				NA		NA						1.32		NA
GC	TOLUENE	UG/KG	1500	NYTAGM				NA	0.51	NA								NA
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM				NA		NA								NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-10 Component 1, Former AFP-68 Process Areas 22 and 24 (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-22-SO-BP1-0.0-0.5	C1-22-SO-D(+50)100-13.5-14.0	C1-22-SO-D(+50)100-3.5-4.0	C1-22-SO-D(+50)75-0.0-0.5	C1-22-SO-D(+50)75-13.5-14.0	C1-22-SO-D(+50)75-13.5-14.0DUP	C1-22-SO-D(+50)75-3.5-4.0	C1-22-SO-D(-3)300-0.0-0.5	C1-22-SO-D(-3)300-2.0-2.5	C1-22-SO-D(-3)300-2.0-2.5-DUP	C1-22-SO-D(-3)300-6.7-7.0	C1-22-SO-D50-0.0-0.5	C1-22-SO-D50-13.5-14.0	C1-22-SO-D50-3.5-4.0
E4020	PCB	UG/KG	1000	NYTAGM						NA		660						
E4035	PAH	UG/KG	10000	NYTAGM	665	1188	471	436	394	431	396	1224	5051	4912	475	309	1055	196
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM						NA				NA				
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM						NA				NA				
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM						NA				NA				
GC	M & P-XYLENES	UG/KG	1200	NYTAGM						NA				NA				
GC	O-XYLENE	UG/KG	1200	NYTAGM						NA				NA				
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM						NA				NA				
GC	TOLUENE	UG/KG	1500	NYTAGM						NA				NA				
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM						NA				NA				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-10 Component 1, Former AFP-68 Process Areas 22 and 24 (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-22-SO-BP1-0.0-0.5	C1-22-SO-D75-0.0-0.5	C1-22-SO-D75-13.5-14.0	C1-22-SO-D75-3.5-4.0	C1-22/24-SO-C100-0.0-0.5	C1-22/24-SO-C100-1.3-2.0	C1-22/24-SO-C100-12.8-13.5	C1-22/24-SO-C100-3.3-4.0	C1-22/24-SO-C200-0.0-0.5	C1-22/24-SO-C200-0.0-0.5-DUP	C1-22/24-SO-C200-1-REP	C1-22/24-SO-C200-1.0-DUP	C1-22/24-SO-C200-1.3-2.0	C1-22/24-SO-C200-1.3-2.0-DUP
E4020	PCB	UG/KG	1000	NYTAGM		1680							5000	4400		NA		
E4035	PAH	UG/KG	10000	NYTAGM	665	6098	440	287	1794	1092	743	661	3058	3478	1531	NA	1107	1283
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE						80						NA		
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM										NA				NA
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM										NA				NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM										NA				NA
GC	M & P-XYLENES	UG/KG	1200	NYTAGM										NA				NA
GC	O-XYLENE	UG/KG	1200	NYTAGM										NA				NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				1.9						NA				NA
GC	TOLUENE	UG/KG	1500	NYTAGM		0.44								NA				NA
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM										NA				NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 5.6-10 Component 1, Former AFP-68 Process Areas 22 and 24 (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-22-SO-BP1-0.0-0.5	C1-22/24-SO-C200-11.3-12.0	C1-22/24-SO-C200-3.3-4.0	C1-22/24-SO-C300-0.3-0.8	C1-22/24-SO-C300-11.5-12.0	C1-22/24-SO-C300-2.8-3.3	C1-22/24-SO-D100-0.3-0.8	C1-22/24-SO-D100-2.3-2.8	C1-22/24-SO-D100-9.2-9.7	C1-22/24-SO-D200-0.5-1.0	C1-22/24-SO-D200-2.1-2.6	C1-22/24-SO-D200-9-REP	C1-22/24-SO-D200-9.5-10.0	C1-24-SO-A200-0.1-0.6
E4020	PCB	UG/KG	1000	NYTAGM							6000				200			17200
E4035	PAH	UG/KG	10000	NYTAGM	665	1272	2881	1148		82	4289	576	1615	452	1450	2199	766	6436
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM														
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM													2.13	
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM												3.2		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM												2.1		
GC	O-XYLENE	UG/KG	1200	NYTAGM														
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM													1.53	
GC	TOLUENE	UG/KG	1500	NYTAGM														
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM												1	9.1	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-10 Component 1, Former AFP-68 Process Areas 22 and 24 (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-22-SO-BP1-0.0-0.5	C1-24-SO-A200-3.0-3.5	C1-24-SO-A200-3.0-3.5-DUP	C1-24-SO-A300-0.4-0.9	C1-24-SO-A300-3.0-3.5	C1-24-SO-A300-9.2-9.7	C1-24-SO-A85-0.0-0.5	C1-24-SO-A85-0.0-0.5-DUP	C1-24-SO-A85-10-REP	C1-24-SO-A85-11.3-12.0	C1-24-SO-A85-11.3-12.0-DUP	C1-24-SO-A85-3.3-4.0	C1-24-SO-B200-0.2-0.7	C1-24-SO-B200-3.0-3.5
E4020	PCB	UG/KG	1000	NYTAGM			NA					NA	10600		NA			
E4035	PAH	UG/KG	10000	NYTAGM	665	120	NA	313	244	182	465	NA	17656	916	NA	295	1103	1103
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE			NA					NA			NA			
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM											2.22		1.14	
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM						1.23					1.15			
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM														
GC	M & P-XYLENES	UG/KG	1200	NYTAGM														
GC	O-XYLENE	UG/KG	1200	NYTAGM													1.48	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		1.02				3.83		4.3	3.73		1.69			
GC	TOLUENE	UG/KG	1500	NYTAGM														
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM						2.14		2.26	1.69				3	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
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Table 5.6-10 Component 1, Former AFP-68 Process Areas 22 and 24 (West of Wesson Street), Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-22-SO-BP1-0.0-0.5	C1-24-SO-B200-9.2-9.7	C1-24-SO-B300-0.0-0.5	C1-24-SO-B300-13.5-14.0	C1-24-SO-B300-2.6-3.1	C1-24-SO-B85-0.0-0.5	C1-24-SO-B85-0.0-0.5-DUP	C1-24-SO-B85-1.3-2.0	C1-24-SO-B85-1.3-2.0-DUP	C1-24-SO-B85-13.3-14.0	C1-24-SO-B85-3.3-4.0	C1-24-SO-BP1-0.0-0.5	C1-24-SO-BP1-13.5-14.0	C1-24-SO-BP1-3.5-4.0
E4020	PCB	UG/KG	1000	NYTAGM			1080			380	NA					1060		
E4035	PAH	UG/KG	10000	NYTAGM	665	101	7910	301	304	1064	NA	231	208	856	391	2188	1506	527
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE							NA							
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM									NA	1.63				
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM									NA					
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM									NA					
GC	M & P-XYLENES	UG/KG	1200	NYTAGM									NA					
GC	O-XYLENE	UG/KG	1200	NYTAGM									NA					
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM								1.71	NA	1.71				
GC	TOLUENE	UG/KG	1500	NYTAGM									NA					
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM									NA	7.22				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 5.6-11 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-I100-0.5-REP	C1-14-SO-BP2-10-REP	C1-14/16-SO-F200-6-REP	C1-16-SO-H300-1-REP	C1-18S-SO-K190-13.5-14.0-REP
E160.3	PERCENT MOISTURE	%			16.6	NA	NA	NA	3.9
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	8090	NA	NA	NA	5960
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.51 BN	NA	NA	NA	0.32 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	2.4	NA	NA	NA	3.5
SW6010	BARIUM	MG/KG	300	NYTAGM	99.4	NA	NA	NA	57.5
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.3 B	NA	NA	NA	0.17 B
SW6010	BORON	MG/KG			2.3 B	6.4 B	5 B	5.2 B	1.4 B
SW6010	CALCIUM	MG/KG			26600	NA	NA	NA	5080
SW6010	CHROMIUM	MG/KG	50	NYTAGM	16.5	NA	NA	NA	9.7
SW6010	COBALT	MG/KG	30	NYTAGM	5.8	NA	NA	NA	5.5
SW6010	COPPER	MG/KG	50	NYTAGM-BG	16.1	NA	NA	NA	37.2
SW6010	IRON	MG/KG	2000	NYTAGM	19800	NA	NA	NA	17700
SW6010	LEAD	MG/KG	400	NYTAGM	24.7 *	NA	NA	NA	5 *
SW6010	LITHIUM	MG/KG			13.7	21.7	12.8	12.5	12.6
SW6010	MAGNESIUM	MG/KG			12500	NA	NA	NA	3340 N
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	854	NA	NA	NA	746
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	10.8	NA	NA	NA	12.1
SW6010	POTASSIUM	MG/KG			692	NA	NA	NA	720
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG	1.2	NA	NA	NA	0.72
SW6010	SODIUM	MG/KG			136	NA	NA	NA	135
SW6010	VANADIUM	MG/KG	150	NYTAGM	14.9 E	NA	NA	NA	15.1 E
SW6010	ZINC	MG/KG	76	NYTAGM-BG	91.9 N	NA	NA	NA	35.3 N
SW7471	MERCURY	MG/KG	0.1	NYTAGM	0.08 B	NA	NA	NA	0.06 B
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM	0.82	NA	NA	NA	
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM	0.68 P	NA	NA	NA	
SW8081	ENDOSULFAN SULFATE	UG/KG	1000	NYTAGM	0.42 P	NA	NA	NA	
SW8081	GAMMA-CHLORDANE	UG/KG	540	NYTAGM	1 P	NA	NA	NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 5.6-11 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-10-SO-I100-0.5-REP	C1-14-SO-BP2-10-REP	C1-14/16-SO-F200-6-REP	C1-16-SO-H300-1-REP	C1-18S-SO-K190-13.5-14.0-REP
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	0.86 P	NA	NA	NA	0.4 P
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM	1.4 P	NA	NA	NA	0.16 P
SW8270C	BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	50000	NYTAGM	880	NA	NA	380	
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM	56	NA	NA	49	
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM	2.7	NA	NA	2	
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM	6.1	NA	NA	25	
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM	13	NA	NA	47	
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	19	NA	NA	56	
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	16	NA	NA	36	
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	7	NA	NA	26	
SW8310	CHRYSENE	UG/KG	400	NYTAGM	5.4	NA	NA	27	1.3
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM	2.3	NA	NA	6	
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	31	NA	NA	33	
SW8310	FLUORENE	UG/KG	50000	NYTAGM		NA	NA	11	
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM	6.5	NA	NA	18	
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	24	NA	NA	16	0.86
SW8310	PYRENE	UG/KG	50000	NYTAGM	20	NA	NA	27	0.65

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank ··tected

Table 5.6-12 Component 1, Former AFP-68 Process Areas 22 and 24 (West of Wesson Street), Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-22/24-SO-C200-1-REP	C1-22/24-SO-D200-9-REP	C1-24-SO-A85-10-REP
SW6010	BORON	MG/KG			6.3 B	3.3 B	5.3 B
SW6010	LITHIUM	MG/KG			23.8	11.4	18.9
SW8082	AROCLOR 1248	UG/KG	1000	NYTAGM	380	NA	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
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Table 5.6-13 Component 1, Former AFP-68 Process Areas 10, 14, 16 and 18S (West of Wesson Street), Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-14/16-GW-F200
SW6010	ALUMINUM	D	UG/L			152 B
SW6010	ALUMINUM	T	UG/L			159 B
SW6010	ANTIMONY	D	UG/L	3	NYGUIDANCE	2.9 B
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	2.3 B
SW6010	ARSENIC	D	UG/L	25	NYSTANDARD	2.2 B
SW6010	BARIUM	D	UG/L	1000	NYSTANDARD	49.4 B
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	49.8 B
SW6010	BORON	D	UG/L	1000	NYSTANDARD	254
SW6010	BORON	T	UG/L	1000	NYSTANDARD	225
SW6010	CALCIUM	D	UG/L			143000
SW6010	CALCIUM	T	UG/L			141000 E*
SW6010	LEAD	D	UG/L	25	NYSTANDARD	2.9 B
SW6010	LEAD	T	UG/L	25	NYSTANDARD	1 B
SW6010	LITHIUM	D	UG/L			52.7
SW6010	LITHIUM	T	UG/L			54.7
SW6010	MAGNESIUM	D	UG/L	35000	NYSTANDARD	124000
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	123000 *
SW6010	MANGANESE	D	UG/L	300	NYSTANDARD	48.1
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	50.1 *
SW6010	POTASSIUM	D	UG/L			8480
SW6010	POTASSIUM	T	UG/L			8020 *
SW6010	SELENIUM	D	UG/L	10	NYSTANDARD	8
SW6010	SELENIUM	T	UG/L	10	NYSTANDARD	2.9 B
SW6010	SODIUM	D	UG/L	20000	NYSTANDARD	72200
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	71500 *
SW8081	ALPHA-BHC	N	UG/L	0	NYSTANDARD	0.03 P
SW8260B	ACETONE	N	UG/L	50	NYGUIDANCE	7

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

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Table 5.6-14 Component 1, Former AFP-68 Process Areas 22 and 24 (West of Wesson Street), Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-22/24-GW-D200
SW6010	BORON	D	UG/L	1000	NYSTANDARD	170
SW6010	BORON	T	UG/L	1000	NYSTANDARD	256
SW6010	LITHIUM	D	UG/L			4.8 B
SW6010	LITHIUM	T	UG/L			139

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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5.7 FORMER NAVY INTERIM PILOT PRODUCTION PLANT (IPPP)

5.7.1 Site Background

The Navy Interim Pilot Production Plant (IPPP) was a high-energy fuels plant built in 1956 by Olin Corporation in an area along M Street. Former LOOW buildings located on M Street were used by the Navy IPPP. Some of these buildings are still in existence today and are being used by CWM.

The Navy IPPP produced diborane, converted it to pentaborane (and some decaborane), and then converted the pentaborane to HEF-2. Unlike Olin's other plants, the Navy plant produced diborane from a reaction between sodium borohydride and boron trichloride (DeQuasie 1991).

5.7.2 Field Reconnaissance and Surface Features

The main production area of the Navy IPPP was located along M Street (Figure 5.7-1). The western end of the Navy IPPP production area, on the western portion of M Street, is characterized by grass covered areas. The O Ditch bisects the western portion of the Navy IPPP. In addition, CWM Facultative Ponds 1 and 2, as well as the former West Drum Storage Area, are located in the western portion of the Navy IPPP. East of O Ditch, the surface is primarily characterized by asphalt and concrete. This area is now extensively used by CWM for activities such as leachate testing, stockpiling soil with COPC, and laboratory testing.

5.7.3 Soil Sampling Program

Field activities at the Navy IPPP included collection of surface soil, subsurface soil, and ground-water samples. The ground-water sampling program is discussed in Section 5.7.7.

A sampling grid with an approximate 200-ft interval was established across the area (Figure 5.7-1). Grid points were given alpha-numeric designations, with A0 being the southwestern origin of the grid. Because of the proximity of B0 to the grid established for AFP-68 Process Area 20, this location was not sampled as part of the investigation for the Navy IPPP. Similarly, location B400 was not sampled because of its location within the former CWM West Drum Storage Area, and due to the presence of a storm-water control pond. Due to the presence of stockpiled soil, locations B1400 and B1600 were shifted to the north. Minor shifts were performed at other locations to avoid foundations, underground lines, and drainages.

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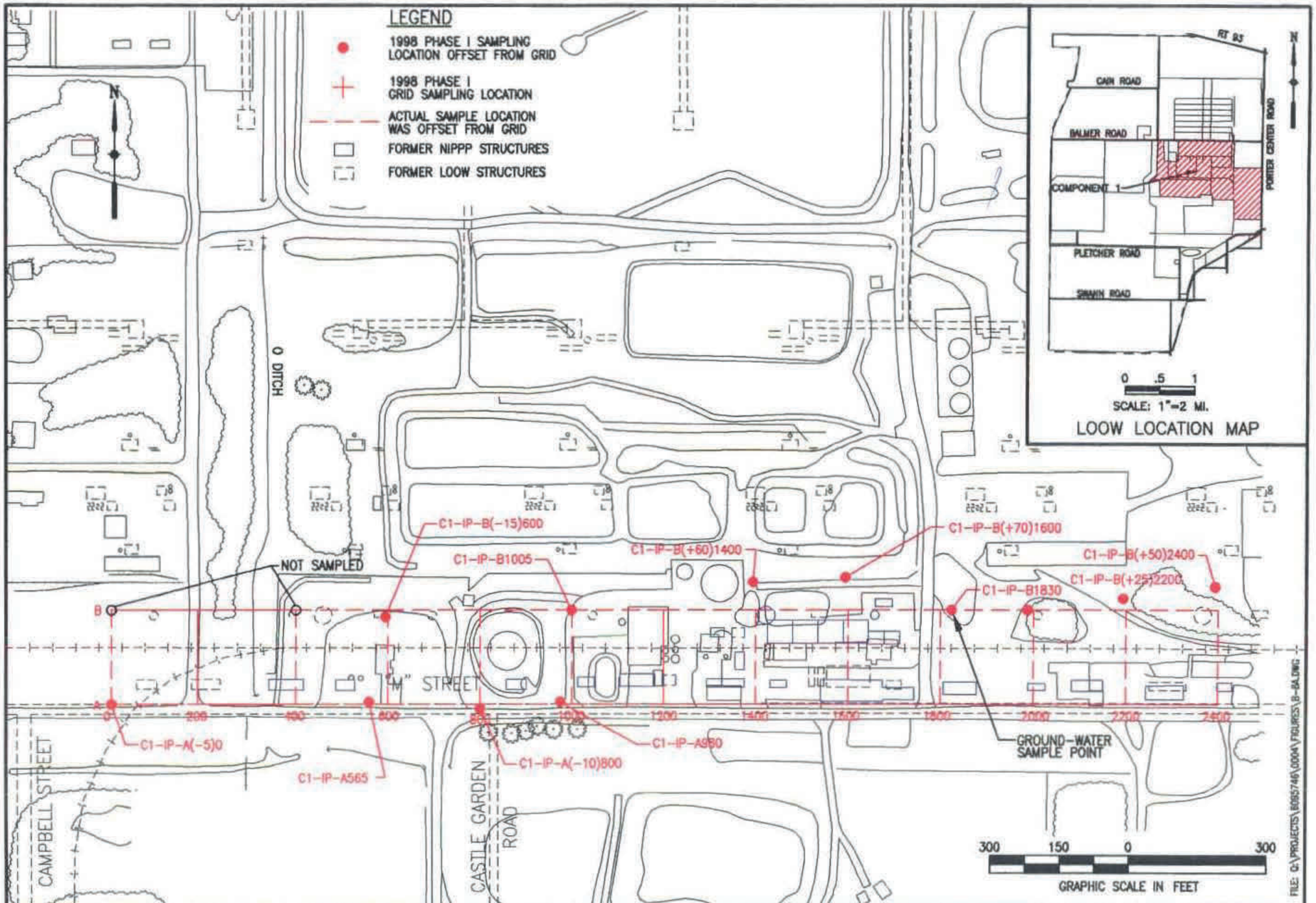

EA® ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 1 (CWM) LOOW NITRATION AREA/ NIPPP SAMPLING LOCATIONS	DESIGNED BY DLR	DRAWN BY FDV	DATE JULY 1999	PROJECT NO. 60957.46
			CHECKED BY SMS	PROJECT MGR. HGP	SCALE AS SHOWN	FIGURE 5.7-1

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Biased points were not placed within the Navy IPPP grid.

Direct push technology was used to perform sampling at each grid location. Subsurface soil samples only, ranging in depth from 6.5 ft to 14 ft bgs, were collected from each location. Soil samples were used to describe site stratigraphy and were field screened for TNT, as proposed in the Work Plan.

5.7.4 Site Stratigraphy

The former IPPP is located in one of the most heavily used portions of the current CWM property. The A row of the grid is located adjacent to M Street, and is consequently undisturbed except for the road construction. However, the B row is located in an area that has potentially been impacted by the railroad, the aqueous waste treatment facility and associated trenching, and other CWM structures and facilities. Consequently, fill material was encountered in most samples collected from the B row, to depths of up to 20 ft bgs.

Along M Street, the subsurface is characterized by UCT to 10 ft bgs, with a moist silt till, occasionally interbedded with UCT, in the 10 to 14 ft bgs range. The same stratigraphy is also encountered on the eastern end of the B row, which is relatively undisturbed, compared to the central and eastern portions of the B row.

5.7.5 Soil Screening Results

TNT was not reported in the soil samples collected from the Navy IPPP (as there were no hits, see Appendix C for the analytical summary table for this area).

5.7.6 Laboratory Analyses and Confirmatory Soil Sample Results

Because there was no reported COPC in the screening results for this area, a sample for laboratory analysis was chosen based on its location within the area of investigation. Location B1830 was selected due to its location relatively distant from the main portion of CWM activities, its location within the center of the Navy IPPP grid, and the presence of a saturated interval.

A sample was re-collected from 2 ft bgs, within an area of slight staining, and was submitted to the laboratory for analysis of boron, lithium, and explosives. Boron and lithium were reported n the laboratory results. Although there are no NY State comparison criteria for boron and lithium, the concentrations did not appear to be elevated in comparison with the average reported concentrations from other samples collected during the Phase I investigation. A summary of reported analytes is presented in Table 5.7-1.

5.7.7 Ground-Water Sampling Program and Results

A 2-in. temporary ground-water sampling point was installed in location B1830. The screening interval was between 5 to 10 ft bgs and included a lens of wet silty sand within the UCT. A ground-water sample was collected and submitted for laboratory analysis of explosives and total and dissolved boron and lithium (Table 5.7-2).

The reported concentration of boron exceeded $1/10^{th}$ of the NY State comparison criteria, but did not exceed the full value of the criteria. Explosives were not reported.

5.7.8 Conclusions and Recommendations

The results from the sampling program at the Navy IPPP indicate that there is no impact from former DOD (former LOOW) activity in this area, other than the possibility of impact from underground utility lines (Chapter 11). However, elevated lithium within the ground water at Waterline Construction Area 4 (the western end of Navy IPPP; discussed in Section 5.3) and slightly elevated boron within the ground water at B1830 indicate a possible impact from Navy IPPP activities. However, because the Navy IPPP is located within an area of heavy use by CWM, and contains areas that have been impacted by CWM activities, this area is not eligible for further investigation under this HTRW project.

Table 5.7-1 Component 1, Former Navy IPPP Process Areas, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-IPPP-SO-B1830-2-REP
SW6010	BORON	MG/KG			7 B
SW6010	LITHIUM	MG/KG			8

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 5.7-2 Component 1, Former Navy IPPP Process Areas, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C1-IP-GW-B1830
SW6010	BORON	D	UG/L	1000	NYSTANDARD	239
SW6010	BORON	T	UG/L	1000	NYSTANDARD	235
SW6010	LITHIUM	D	UG/L			40.4
SW6010	LITHIUM	T	UG/L			55.9

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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6. COMPONENT 2 (SOMERSET GROUP) DATA RESULTS AND EVALUATION

6.1 SITE BACKGROUND

The Somerset Group owns approximately 39 acres of former LOOW property encompassing the northern portion of former AFP-68 (Figure 6.1-1). Within the Somerset Group Property and included in this Phase I RI are former AFP-68 Process Areas 3, 5, 6, 18N, and 30A. The Somerset Group parcel also contains an area of ground scarring and three temporary buildings (T-1, T-2, and T-3). The southern portion of former AFP-68, which extends south of Pine Street into CWM property (Component 1), is addressed in Sections 5.6.1 and 5.6.2.

Process Area 6 was not investigated during the Phase I RI due to its inclusion in an interim remedial action (IRA). An evaluation of potential impact within Process Area 6, is necessary, but will be deferred until the IRA is completed.

Other areas within Component 2 (i.e., area 27, 41, 21, and 30 and 31) were not included in the RI for reasons described in the Final History Search (EA 1998a).

Field activities at the Somerset Group property during the Phase I RI included collection of surface soil, subsurface soil, and ground-water samples. The ground-water sampling program is discussed throughout Section 6.6.

6.2 FIELD RECONNAISSANCE AND SURFACE FEATURES

The majority of the Somerset Group property was heavily wooded and overgrown with brush during these Phase I activities. Some of the areas have since been cleared of brush as part of the asbestos abatement project initiated in the Fall of 1998. Former AFP-68 structures, including a former guard shack/gatehouse, numerous tank cradles, and standing and collapsed concrete, metal, and wooden structures associated with various process areas are present throughout the area. Building debris, such as corrugated asbestos panels (transite), were scattered around the process areas, but were targeted for removal during the asbestos abatement program. The Central Drainage Ditch is located in the western portions of Process Areas T-3, 30A, and T-1/T-2. A railroad track trends north-south between Process Area 18 and Temporary Building T3.

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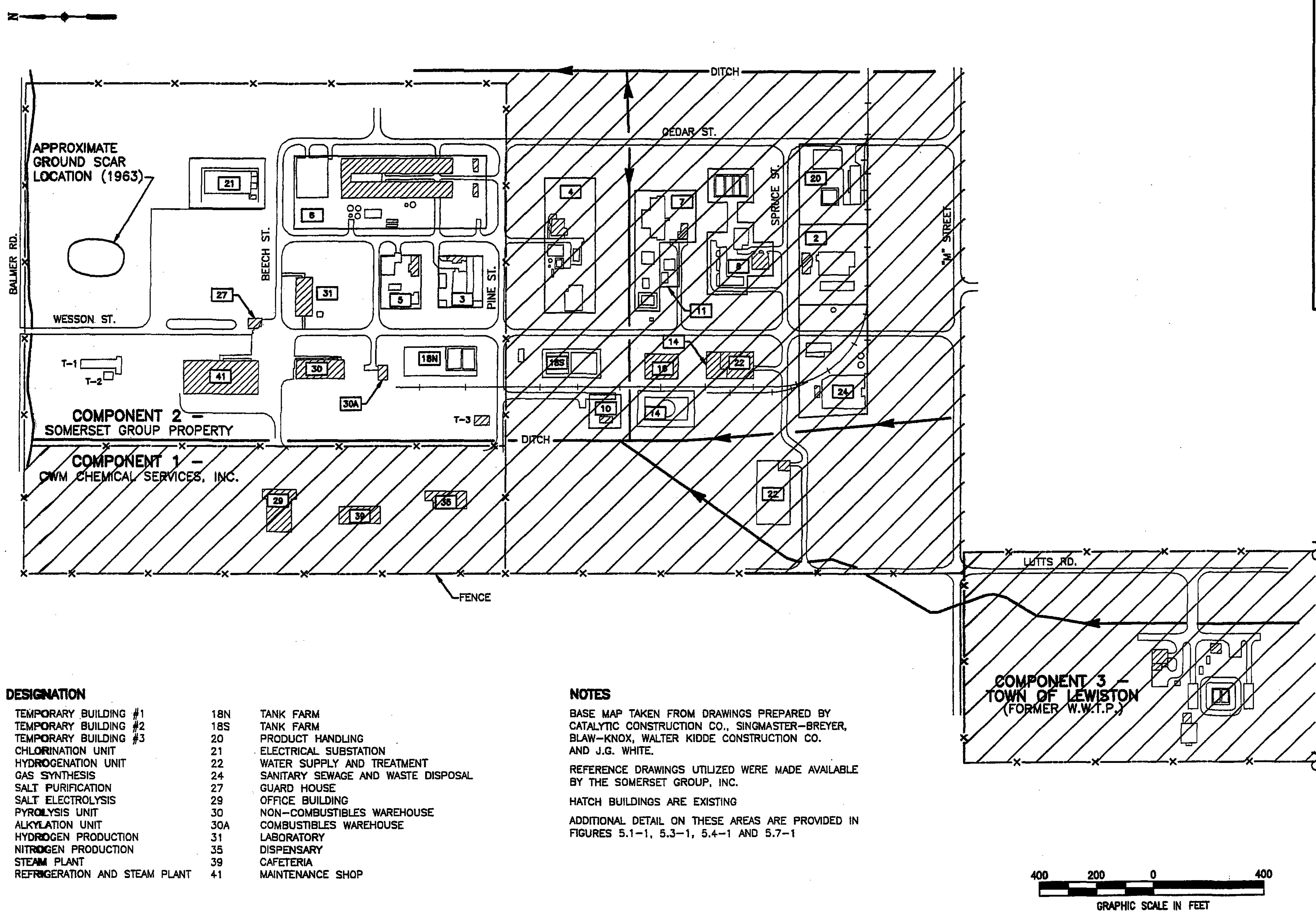

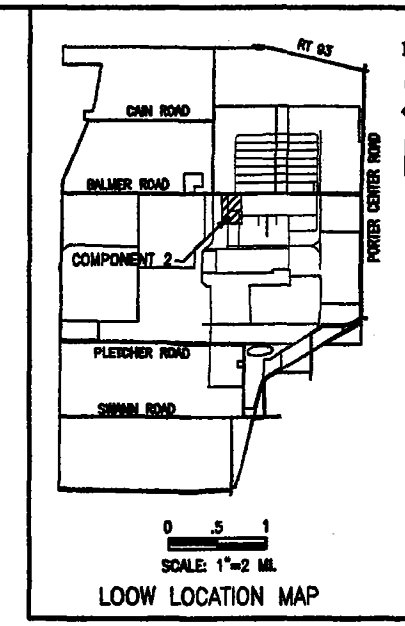

AREA DESIGNATION

T-1	TEMPORARY BUILDING #1	18N	TANK FARM
T-2	TEMPORARY BUILDING #2	18S	TANK FARM
T-3	TEMPORARY BUILDING #3	20	PRODUCT HANDLING
2	CHLORINATION UNIT	21	ELECTRICAL SUBSTATION
3	HYDROGENATION UNIT	22	WATER SUPPLY AND TREATMENT
4	GAS SYNTHESIS	24	SANITARY SEWAGE AND WASTE DISPOSAL
5	SALT PURIFICATION	27	GUARD HOUSE
6	SALT ELECTROLYSIS	29	OFFICE BUILDING
7	PYROLYSIS UNIT	30	NON-COMBUSTIBLES WAREHOUSE
8	ALKYLATION UNIT	30A	COMBUSTIBLES WAREHOUSE
10	HYDROGEN PRODUCTION	31	LABORATORY
11	NITROGEN PRODUCTION	35	DISPENSARY
14	STEAM PLANT	39	CAFETERIA
16	REFRIGERATION AND STEAM PLANT	41	MAINTENANCE SHOP

NOTES

BASE MAP TAKEN FROM DRAWINGS PREPARED BY CATALYTIC CONSTRUCTION CO., SINGMASTER-BREYER, BLAW-KNOX, WALTER KIDDE CONSTRUCTION CO. AND J.G. WHITE.

REFERENCE DRAWINGS UTILIZED WERE MADE AVAILABLE BY THE SOMERSET GROUP, INC.

HATCH BUILDINGS ARE EXISTING

ADDITIONAL DETAIL ON THESE AREAS ARE PROVIDED IN FIGURES 5.1-1, 5.3-1, 5.4-1 AND 5.7-1

SOURCE: ACRES (1992)

FILE: Q:\PROJECTS\60957.46\0004\2-2-2-1B.DWG

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 2 (SOMERSET GROUP) AFP-68 SITE LAYOUT	DESIGNED BY DAB	DRAWN BY FDV	DATE MAY 1999	PROJECT NO. 60957.46	FILE NAME 2-2-2-1B
			CHECKED BY SMS	PROJECT MGR. HGP	SCALE AS SHOWN	DRAWING NO. –	FIGURE 6.1-1

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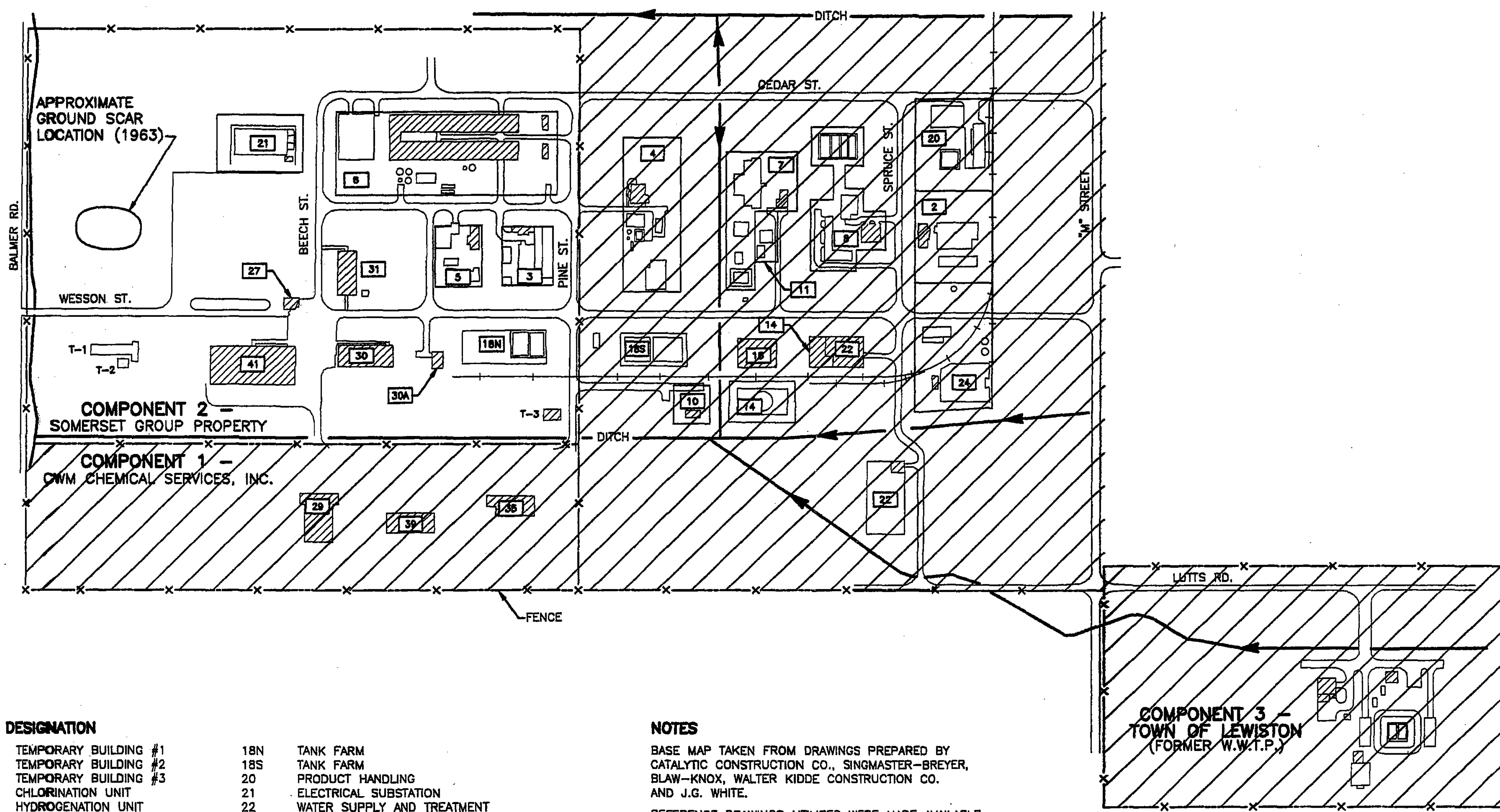

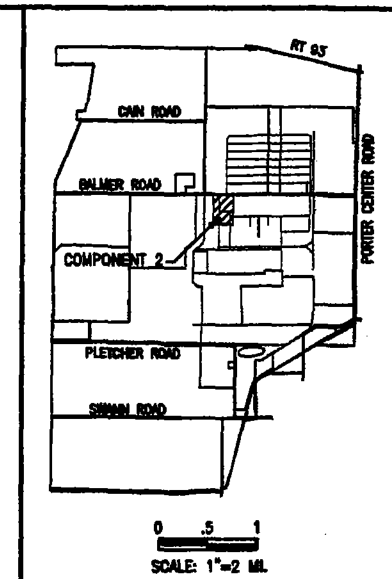

LOOW LOCATION MAP

AREA DESIGNATION

T-1	TEMPORARY BUILDING #1	18N	TANK FARM
T-2	TEMPORARY BUILDING #2	18S	TANK FARM
T-3	TEMPORARY BUILDING #3	20	PRODUCT HANDLING
2	CHLORINATION UNIT	21	ELECTRICAL SUBSTATION
3	HYDROGENATION UNIT	22	WATER SUPPLY AND TREATMENT
4	GAS SYNTHESIS	24	SANITARY SEWAGE AND WASTE DISPOSAL
5	SALT PURIFICATION	27	GUARD HOUSE
6	SALT ELECTROLYSIS	29	OFFICE BUILDING
7	PYROLYSIS UNIT	30	NON-COMBUSTIBLES WAREHOUSE
8	ALKYLATION UNIT	30A	COMBUSTIBLES WAREHOUSE
10	HYDROGEN PRODUCTION	31	LABORATORY
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16	REFRIGERATION AND STEAM PLANT	41	MAINTENANCE SHOP

NOTES

BASE MAP TAKEN FROM DRAWINGS PREPARED BY CATALYTIC CONSTRUCTION CO., SINGMASTER-BREYER, BLAW-KNOX, WALTER KIDDE CONSTRUCTION CO. AND J.G. WHITE.

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HATCH BUILDINGS ARE EXISTING

ADDITIONAL DETAIL ON THESE AREAS ARE PROVIDED IN FIGURES 5.1-1, 5.3-1, 5.4-1 AND 5.7-1

400 200 0 400

GRAPHIC SCALE IN FEET

SOURCE: ACRES (1992)

FILE: C:\PROJECTS\60957.46\0004\2-2-2-1b.DWG

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 2 (SOMERSET GROUP) AFP-68 SITE LAYOUT	DESIGNED BY DAB	DRAWN BY FDV	DATE MAY 1999	PROJECT NO. 60957.46	FILE NAME 2-2-2-1B
			CHECKED BY SMS	PROJECT MGR. HGP	SCALE AS SHOWN	DRAWING NO. –	FIGURE 6.1-1

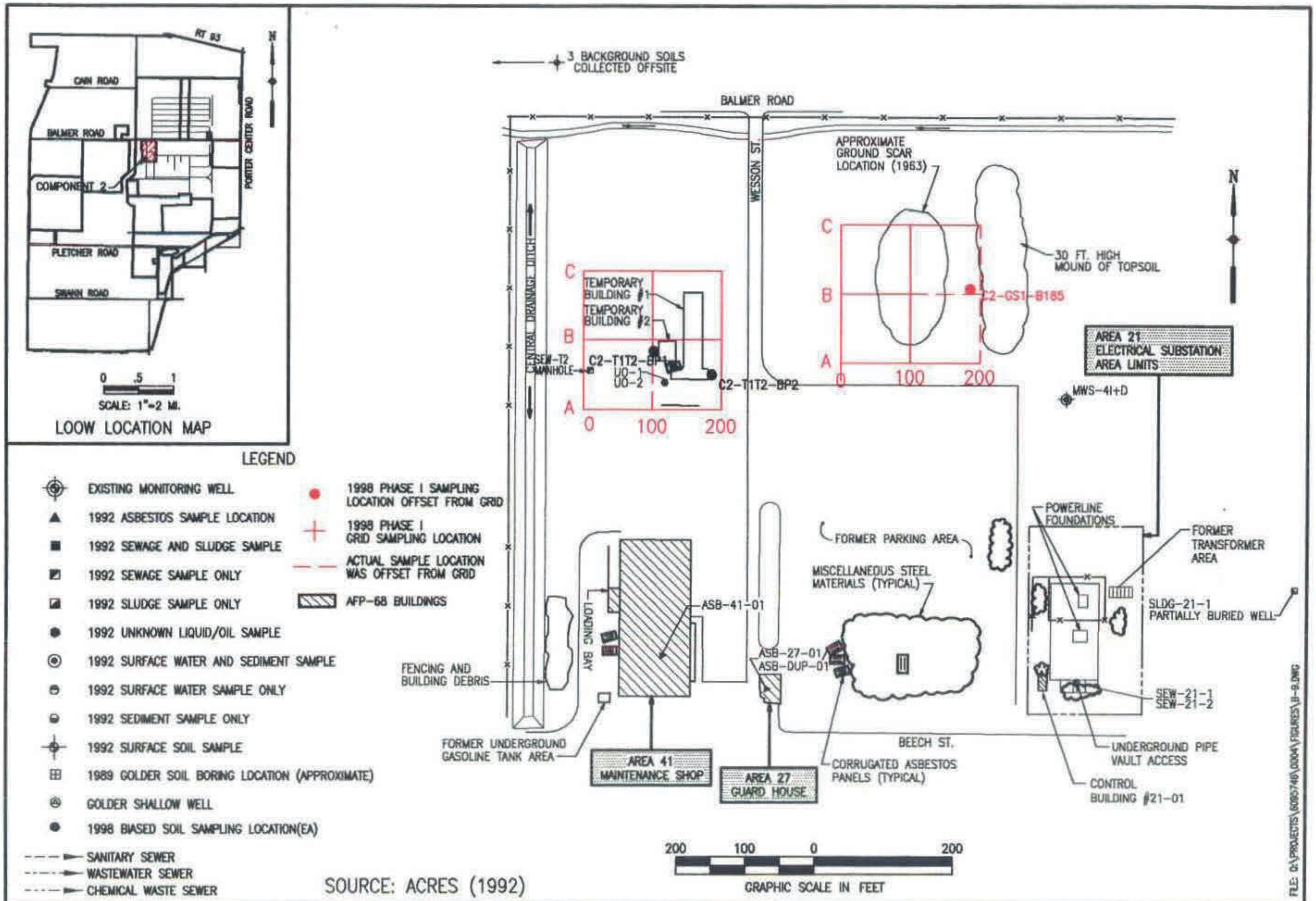
During the reconnaissance, the manholes, sumps, and chemical waste lift stations first described by Acres in 1992 were encountered (Acres 1992). These underground utilities were sampled during the Preliminary Contaminant Assessment (PCA) and therefore, were not re-sampled during this Phase I (Acres 1992). The areas appeared to be in the same condition as described in detail in the PCA. A large soil pile is located on the eastern portion of the ground scar area The soil was placed there circa 1971 by the current landowner. The landowner maintains the areas adjacent to former AFP-68 buildings located in Process Areas 27, 30, 31, 41 and T3. These areas are characterized by short, maintained grass and are currently being used to store a variety of equipment and vehicles. The other Process Areas (Areas 3, 5, 6, 18N, and 30A) were left to succeed, but have since been cleared of vegetation as part of the IRA.

6.3 SOIL SAMPLING PROGRAM

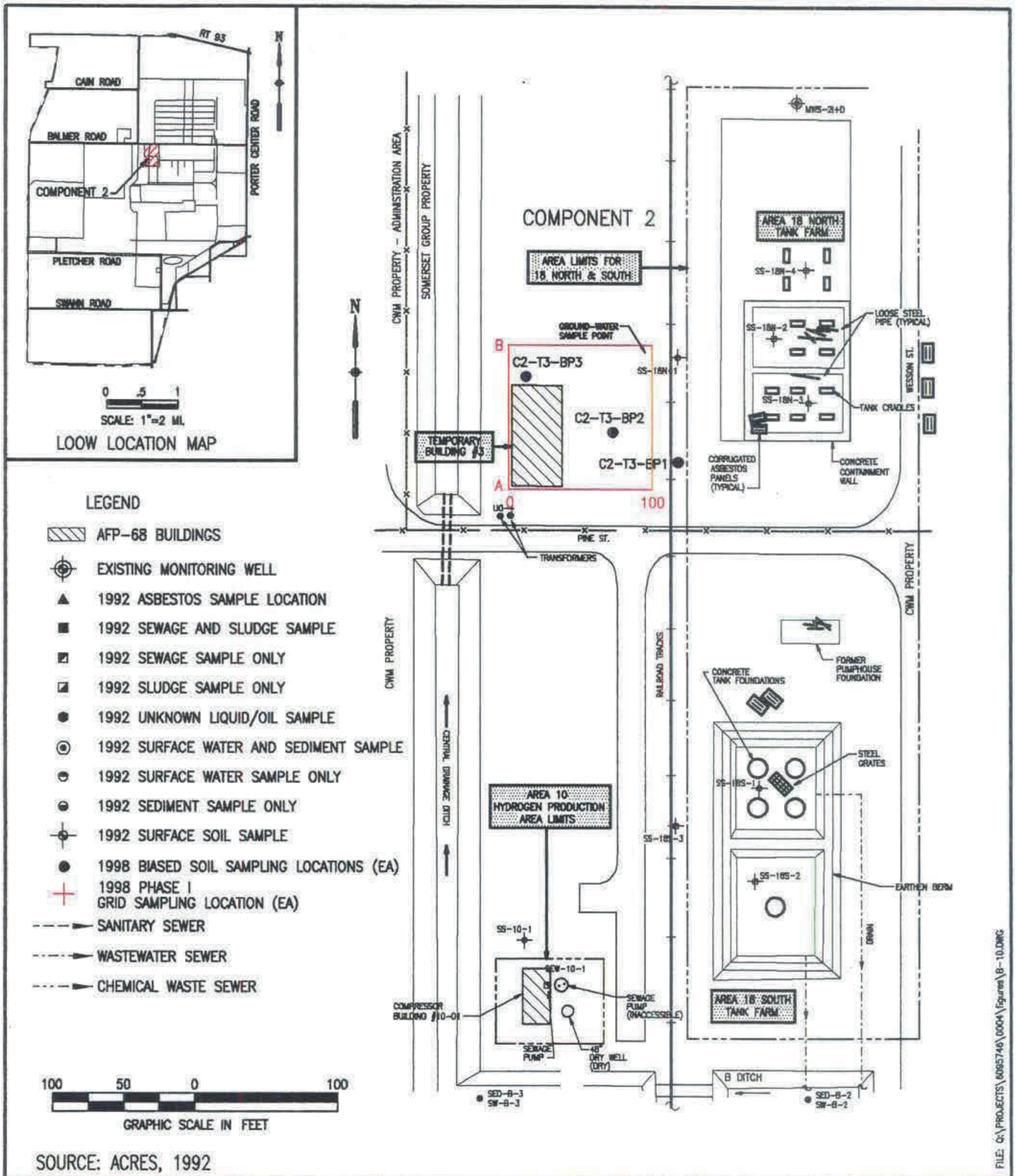
Six sampling grids, with approximately 100 ft between sampling points, were established across the site (Figures 6.3-1 through 6.3-5). Grid points were given alphanumeric designations, with A0 being the southwestern origin of the grids. In addition, biased sampling locations were established within most of the grids.

Direct push technology was used to perform sampling at each grid location. Generally, surface soil samples, ranging in depth from 0 ft to 2.6 ft bgs, semi-subsurface soil samples, ranging in depth from 3.3 to 4 ft bgs, and subsurface soil samples, ranging in depth from 13 to 16 ft bgs, were collected from each location. Soil samples were field screened for VOCs, PAHs, PCB, and TNT. In addition, samples collected from the vicinity of Temporary Buildings T1 and T2 were screened for chromium.

Soil field-screening results were reviewed to designate locations for collection of laboratory confirmatory samples. Screening locations that exhibited the highest concentrations of potential COPC were revisited. With the exception of samples collected from Area 3 and T3, samples were collected, screened, and submitted for confirmatory laboratory analysis of full TCL/TAL analytes, boron, lithium, and explosives. Samples collected from Area 3 and T3 were submitted for laboratory analysis of DOD marker compounds, as discussed in Section 6.6.



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 2 (SOMERSET GROUP) GROUND SCAR AREA AND BUILDINGS T-1 AND T-2 SAMPLING GRID LOCATIONS	DESIGNED BY DLR	DRAWN BY FDV	DATE JULY 1999	PROJECT NO. 60957.46
			CHECKED BY SMS	PROJECT MGR. HGP	SCALE AS SHOWN	FIGURE 6.3-1

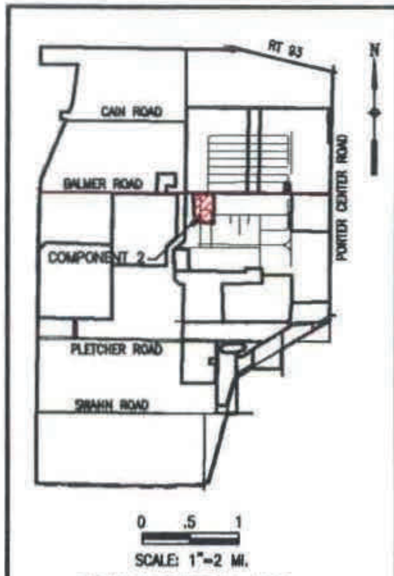


EA ENGINEERING, SCIENCE, AND TECHNOLOGY

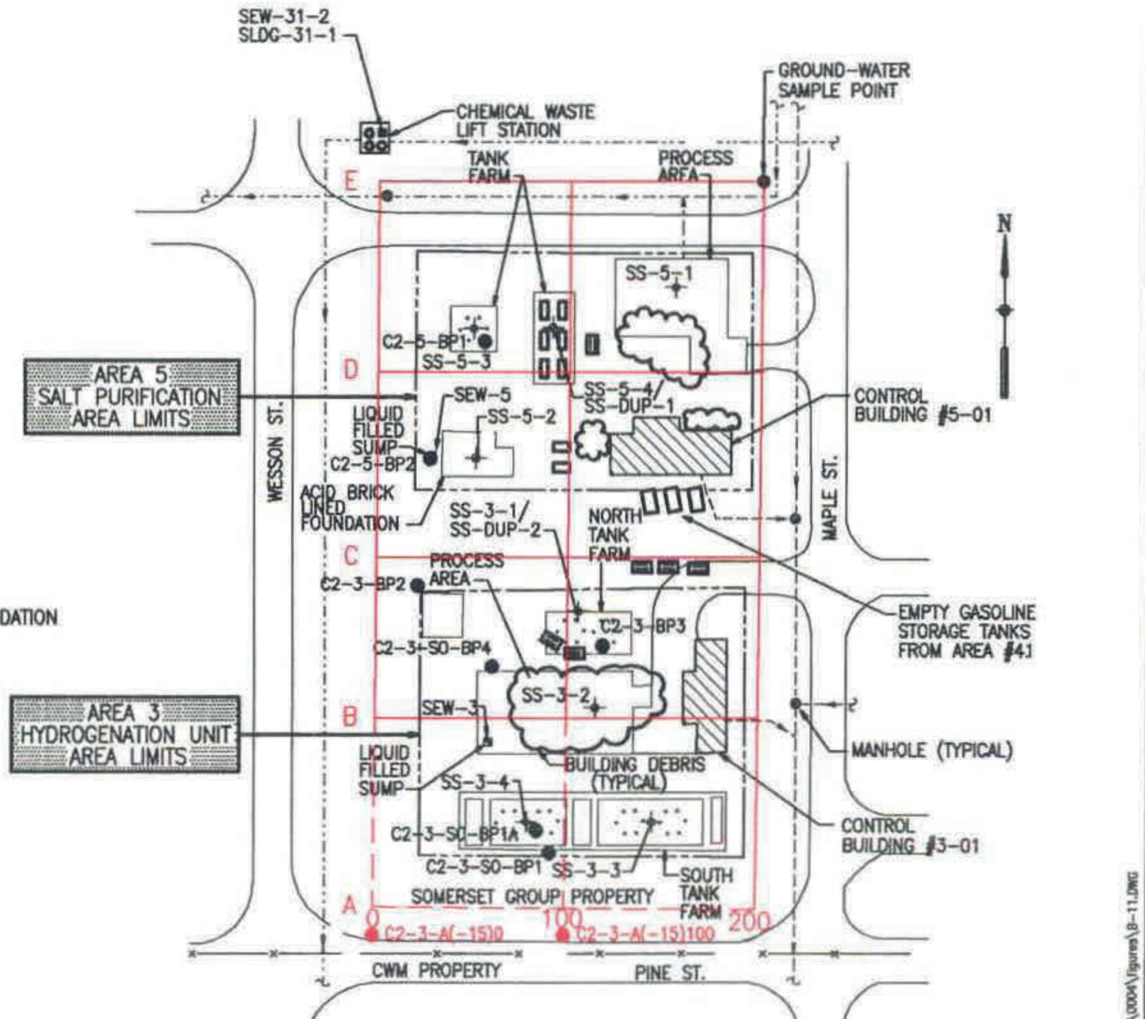
BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

COMPONENT 2 (SOMERSET GROUP)
BUILDING T-3
SAMPLING GRID LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	DAB	FDV	SMS	AS SHOWN	JULY 1999	60957.46	6.3-2



LOOW LOCATION MAP



LEGEND

- AFP-68 BUILDINGS
- CONCRETE FOUNDATION
- EXISTING MONITORING WELL
- 1992 ASBESTOS SAMPLE LOCATION
- 1992 SEWAGE AND SLUDGE SAMPLE
- 1992 SEWAGE SAMPLE ONLY
- 1992 SLUDGE SAMPLE ONLY
- 1992 UNKNOWN LIQUID/OIL SAMPLE
- 1992 SURFACE WATER AND SEDIMENT SAMPLE
- 1992 SURFACE WATER SAMPLE ONLY
- 1992 SEDIMENT SAMPLE ONLY
- 1992 SURFACE SOIL SAMPLE
- 1998 PHASE I BIASED SOIL SAMPLING LOCATION (EA)
- SANITARY SEWER
- WASTEWATER SEWER
- CHEMICAL WASTE SEWER
- 1998 PHASE I SAMPLING LOCATION OFFSET FROM GRID
- 1998 PHASE I GRID SAMPLING LOCATION
- ACTUAL SAMPLE LOCATION WAS OFFSET FROM GRID

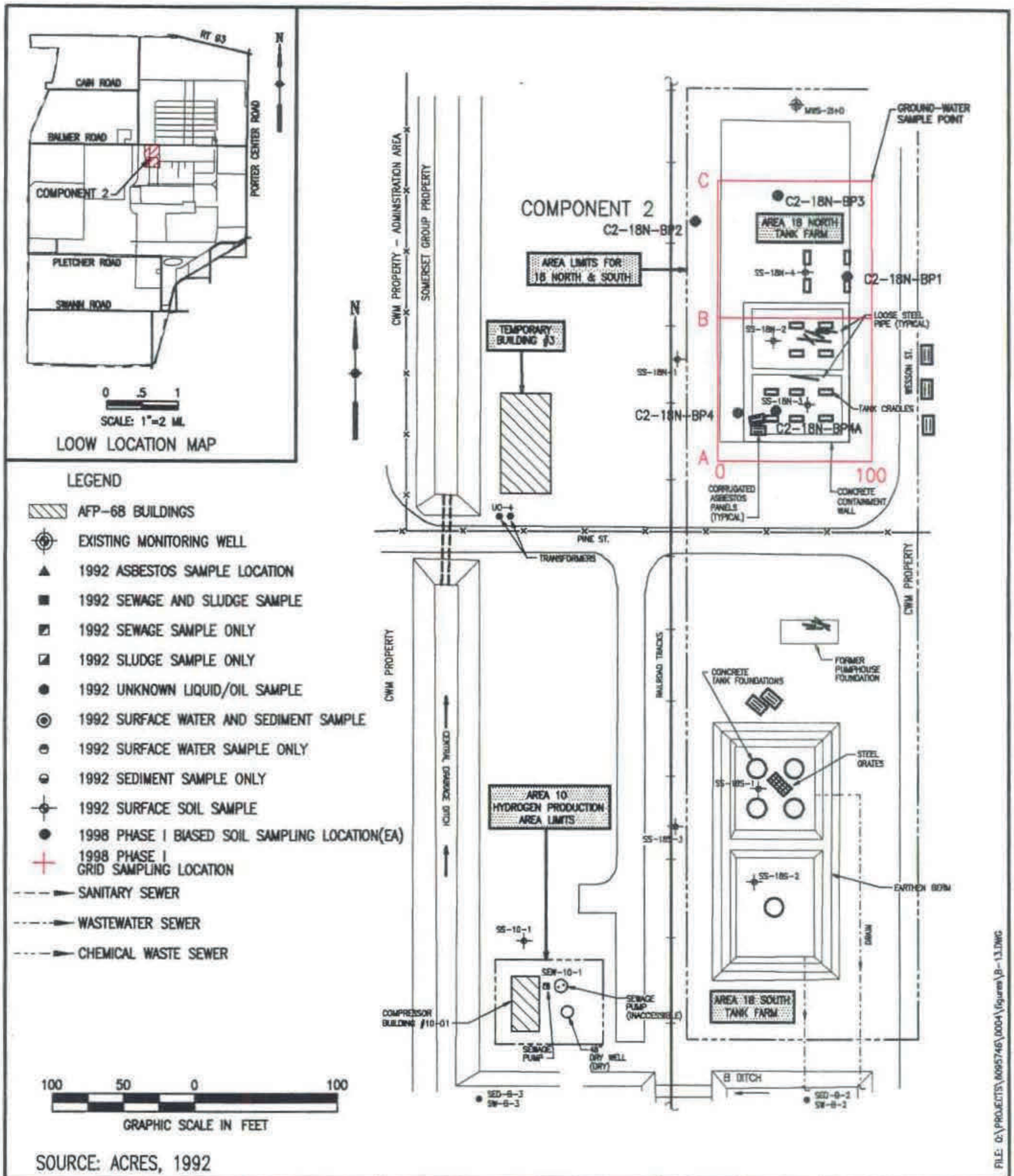
100 50 0 100

GRAPHIC SCALE IN FEET

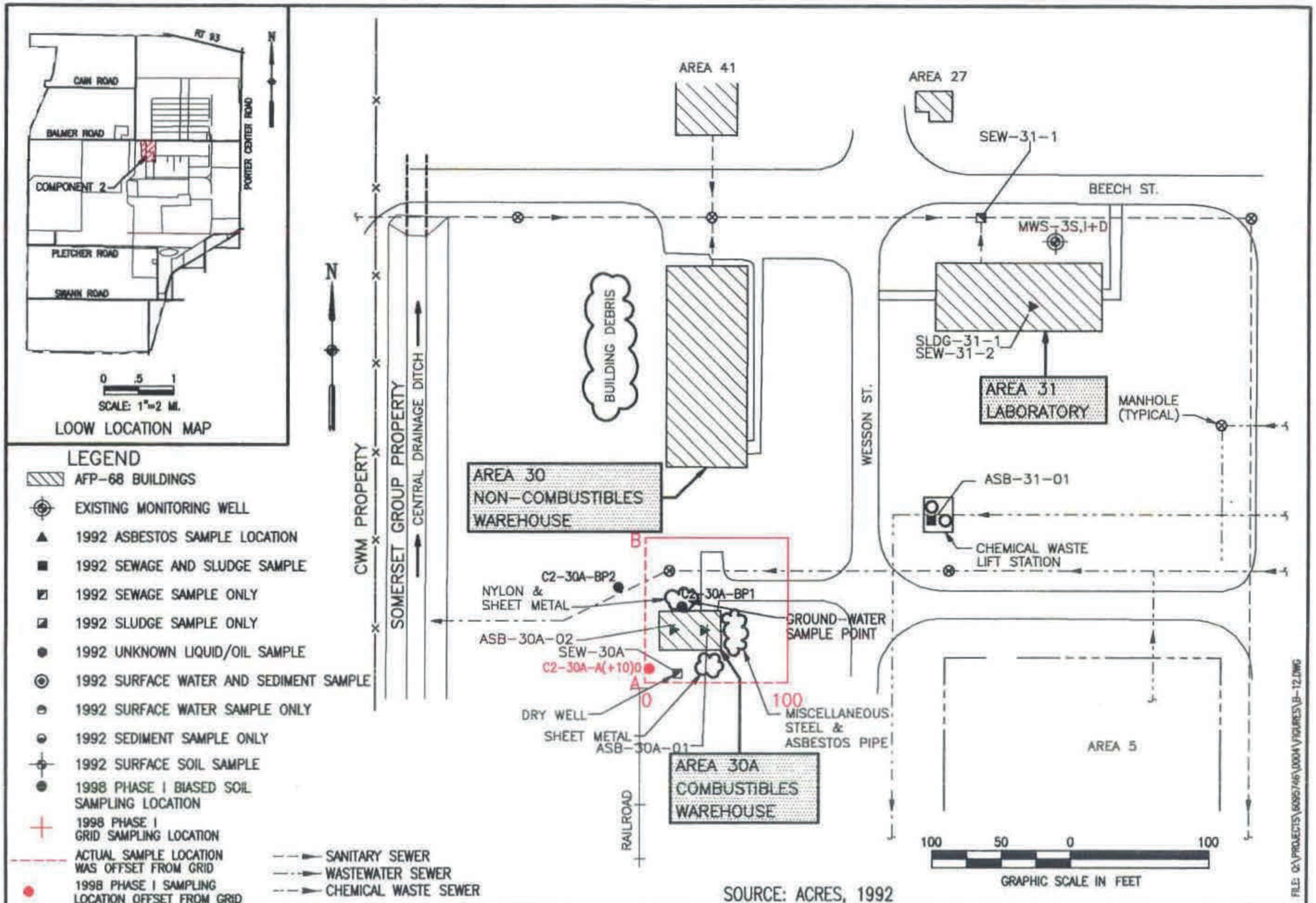
SOURCE: ACRES (1992)

FILE: C:\PROJECTS\60957.46\0004\figures\6-11.DWG

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 2 (SOMERSET GROUP) PROCESS AREAS 3 & 5 SAMPLING GRID LOCATIONS	DESIGNED BY DAB	DRAWN BY FDV	DATE JULY 1999	PROJECT NO. 60957.46
			CHECKED BY SMS	PROJECT MGR. HGP	SCALE AS SHOWN	FIGURE 6.3-3



EA ENGINEERING, SCIENCE, AND TECHNOLOGY		BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK			COMPONENT 2 (SOMERSET GROUP) PROCESS AREA 18N SAMPLING GRID LOCATIONS		
PROJECT MGR HGP	DESIGNED BY DAB	DRAWN BY FDV	CHECKED BY SMS	SCALE AS SHOWN	DATE JULY 1999	PROJECT NO 60957.46	FIGURE 6.3-4



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 2 (SOMERSET GROUP) PROCESS AREA 30A SAMPLING GRID LOCATIONS	DESIGNED BY DLR	DRAWN BY FDV	DATE JULY 1999	PROJECT NO. 60957.46
			CHECKED BY SMS	PROJECT MGR. HGP	SCALE AS SHOWN	FIGURE 6.3-5

6.4 SITE STRATIGRAPHY

6.4.1 Surface Soil

Surface soil encountered on the Somerset Group Property generally consisted of dry, clayey silts (CL/ML), with some fine sands. Occasionally, the surface soil was classified as an upper clay till (UCT). In wooded areas, the upper 0 to 0.5 ft were highly organic and moist.

Due to past use, it is expected that the surface soil was altered through grading, particularly in the immediate vicinity of buildings (i.e., Process Areas 3, 5, and 6). UCT was generally encountered 2 to 4 ft bgs, immediately below the surface layer. Fill material was occasionally encountered, but it was not a major component of the surface strata.

6.4.2 Subsurface Stratigraphy

Subsurface stratigraphy was generally characterized as UCT, with rare laminations or thin lenses (less than 3 in.) of silt, fine sand, and/or gravel (Figure 6.4-1). The target unit for field screening the deep sample was the UST. Although the silt unit was discontinuous, in most locations the UST layer was commonly found beneath the UCT from 10 to 16 ft bgs. The GLC was usually encountered at depths of 14 to 16 ft bgs. At B100, in Process Area 3, a 4 ¼-in. hollow stem auger (HSA) was used to drill through a concrete slab with a thickness of 1 ft. Soil encountered directly beneath the concrete was wet, sandy silt. The B100 location was later selected for ground-water analysis, as discussed in Section 6.6. Little water was reported in subsurface strata at most locations.

6.5 Soil Screening Results

6.5.1 Temporary Buildings 1 & 2 (T-1 & T-2)

A 200 ft by 200 ft sampling grid, for a total of 9 grid sampling points (A0 through C200) was established across the area, encompassing the two building foundations (Figure 6.3-1). In addition, two biased points were placed within the grid. The first T1-BP1, was placed adjacent to a low portion of the foundation of Temporary Building 2. The second, T1-BP2, was placed adjacent to the building foundation of Temporary Building 1 in the vicinity of large diameter metal pipes emerging from below grade. Samples were collected from each location and screened for VOCs, PAH, PCB, TNT, and chromium.

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Cross Section of Component 2

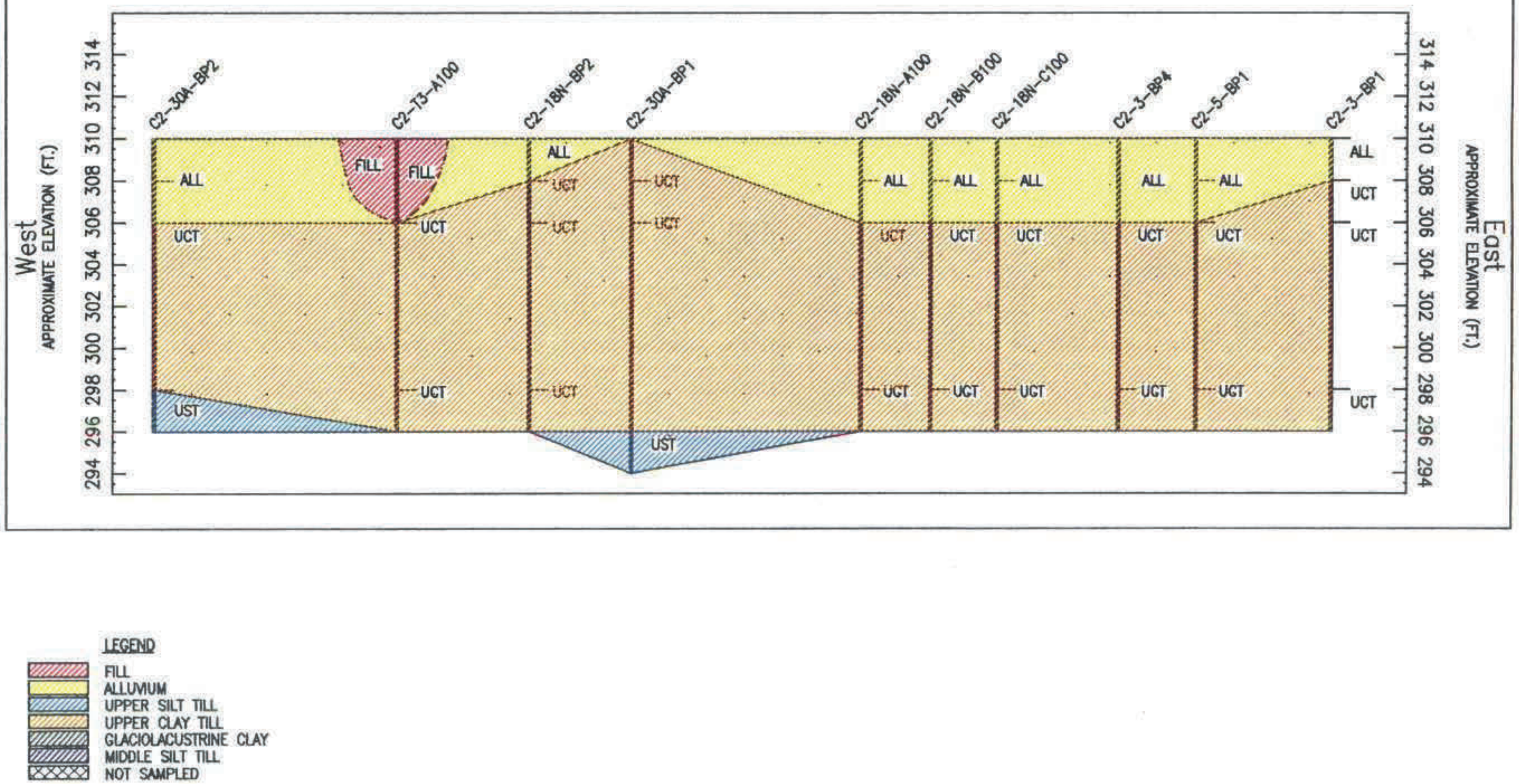

FIGURE 6.4-1

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Photograph 6.5-1. Photograph looking south, showing concrete foundation for Building T-1.

Soil screening results for T-1 and T-2 are included in Table 6.5-1. One VOC, TCE was reported in the field screening samples. The TCE was reported in the surface soil sample collected from C100, but was reported at concentrations that did not exceed 1/10th of the NY State comparison criteria. TNT and PCB were not reported in field screening samples. PAHs were reported in each sample submitted for field screening; however the total PAH concentrations in the initial samples did not exceed the full value of the NY State comparison criteria. The reported total PAH concentrations of five surface soil samples (collected from BP2, A0, B100, C0 and C100) exceeded 1/10th of the NY State comparison criteria of 10,000 µg/kg for total carcinogenic SVOCs. Chromium was not reported in the field screening samples (Appendix B). Photograph 6.5-1 shows the vicinity of T-1.

6.5.2 Temporary Building 3 (T-3)

Photograph 6.5-2. Photograph looking south/southwest from inside door at northeast corner of T-3. Photograph shows current contents of the building.

Four sampling points were established in a 100 ft by 100 ft grid around Temporary Building T-3 (A0 through B100) (Figure 6.3-2). In addition, three biased points were placed in the area. T3-BP1 was placed adjacent to the former AFP-68 railroad track. T3-BP2 was placed in the center of the grid in a low area devoid of vegetation. The last biased point, T3-BP3, was placed adjacent to and north of the building in a small drainage swale. Samples were fielded screened for VOCs, PAHs, PCB, and TNT. Soil screening results for T-3 can be found in Table 6.5-2. VOCs were reported in field screening samples. The reported VOC concentrations did not exceed 1/10th of the NY State comparison criteria. TNT and PCB were not reported in field screening samples. PAHs were reported in each sample submitted for field screening; however the total PAH concentrations did not exceed the full value of the NY State comparison criteria. The reported total PAH concentrations of two surface soil samples, BP1 and B100, exceeded 1/10th of the NY State comparison criteria of 10,000 µg/kg for total carcinogenic SVOCs. Photograph 6.5-2 shows the interior of T-3.

6.5.3 Process Areas 3 and 5

Photograph 6.5-3A. Photograph looking southwest at Building 5-01.

Photograph 6.5-3B Photograph looking east/southeast at Building 3-01.

Sample locations for Process Areas 3 and 5 were combined into one grid, extending 200 ft to the east and 400 ft to the north. In addition, 6 biased points, two in Process Area 5 and four in Process Area 3 were established within the grid (Figure 6.6-3). The table below summarizes the rationale for placement of the biased points.

Biased Sampling Point	Rationale Behind Placement
C2-3-SO-BP1	Composite samples collected from this western portion of the tank farm area historically reported PCB and mercury (Acres 1992). Note that the surface and semi-subsurface sample was collected from the center of the western tank farm (see BP1A) and directional drilling was performed from the south edge of the tank farm and was used to obtain the subsurface sample beneath the tank farm.
C2-3-SO-BP1A	Composite samples collected from this area historically reported elevated PCB and mercury (Acres 1992). This is the location of the surface and semi-subsurface samples for BP1. The samples were collected by hand-augering within the walled tank farm.
C2-3-SO-BP2	Placed in an apparent drainage pit. A possible impact area from the outfall of two visible pipes. One pipe trended from Process Area 3 the other from Process Area 5.
C2-3-SO-BP3	Rubble in area, including 5-gallon containers. Composite samples collected from this area historically reported PCB and PAHs. (Acres 1992).

Biased Sampling Point	Rationale Behind Placement
C2-3-SO-BP4	Placed adjacent to an apparent drainage pit at the edge of a concrete foundation in Process Area 3.
C2-5-SO-BP1	Composite samples collected from this area historically reported elevated PAH, pesticides, and chromium (Acres 1992).
C2-5-SO-BP2	Located adjacent to a liquid-filled pit and down gradient of an area historically reported to contain elevated chromium (Acres1992).

Samples were field screened for VOCs, PAHs, PCB, and TNT. Samples collected from grid locations D200 and E200 were inadvertently not field screened for PAH, PCB, or TNT. Soil screening results for Process Areas 3 and 5 are included in Table 6.5-3. VOCs were reported in 8 of the original samples collected at Process Areas 3 and 5, and one duplicate sample. The highest concentration of VOCs, 71.9 µg/kg of *m-* & *p*-xylenes, was reported in location B100 at 0 to 0.5 ft bgs. The reported concentrations did not exceed 1/10th of the NY State comparison criteria. TNT and PCB were not reported in the samples that were collected from at Process Areas 3 and 5. PAHs were reported in each sample submitted for field screening, but concentrations did not exceed the full value of the NY State comparison criteria. The reported total PAH concentrations in nine surface soil samples (BP1, BP4, A100, B0, B100, C200, D100, E0, and E100) and two semi-subsurface soil samples (BP1 and D0) exceeded 1/10th of the NY State comparison criteria of 10,000 µg/kg for total carcinogenic SVOCs. Photos 6.5-3A and B show buildings associated with Process Areas 5 and 3, respectively.

6.5.4 Process Area 18N

A sampling grid comprised of six locations, and extending 100 ft to the east and 200 ft to the north, to row C, was established across the area. In addition, four biased points were placed. The table below summarizes the rationale behind placement of the biased points.

Biased Sampling Point	Rationale Behind Placement
C2-18N-SO-BP1	Adjacent to an Area 18N tank cradle.
C2-18N-SO-BP2	Adjacent to a former AFP-68 railroad.
C2-18N-SO-BP3	Between the railroad track and the tank farm.

Biased Sampling Point	Rationale Behind Placement
C2-18N-SO-BP4	Composite samples collected from this southern tank farm historically reported elevated PAHs and pesticides (Acres 1992). This is the surface location of a directional boring angled such that the subsurface sample would be collected from beneath BP4A, within the walled tank farm. The surface and semi-subsurface soil sample was collected from within the wall (see BP4A). Sampling was performed in this manner to avoid damage to the concrete tank wall.
C2-18N-SO-BP4A	Composite samples collected from this area historically reported elevated PAHs and pesticides (Acres 1992). This is the surface and semi-subsurface sample location for BP4. The samples were collected within the walled tank farm using a hand auger.

Directional drilling was performed at location BP4. Therefore, two locations are listed. BP4A is the location within the walled tank farm. A hand auger was used at this location to retrieve the surface and semi-subsurface sample. Directional drilling was performed from BP4, which was directly adjacent to, but outside of the tank farm wall. The angle was set on the direct push rig such that the subsurface sample from BP4 was collected from beneath the tank cradles within the walled tank farm, in the vicinity of BP4A. Samples were field screened for VOCs, PAHs, PCB, and TNT.

Photograph 6.5-4. Tank cradles within former Process Area 18N.

Soil-screening results for Process Area 18N are included in Table 6.5-4. VOCs, TNT, and PCB were not reported in field screening samples collected at Process Area 18N.

PAHs were reported in each sample submitted for field screening. The reported total PAH concentrations of the surface soil sample from BP2 exceeded the full value of the NY State comparison criteria recommended soil cleanup objective of 10,000 µg/kg for total carcinogenic SVOCs. The reported concentration for this location was 10,204 µg/kg. Two surface soil samples, BP3 and BP4A, contained PAH at concentrations exceeding 1/10th the NY State comparison criteria. This may be due to the material used to lay the railroad bed. Photograph 6.5-4 shows the vicinity of Process Area 18N.

6.5.5 Process Area 30A

Photograph 6.5-5. Photograph looking northeast near location A(+10) 0. Photograph shows southwest corner of Building 30A.

A 100 ft by 100 ft grid comprised of four sampling locations was established around Process Area 30A (Figure 6.3-5). The A row was shifted approximately 10 ft to the north to avoid an east-west trending drainage ditch that traverses the area. In addition, two biased points were placed in the area. 30A-BP1 was placed on the north side of the Process Area 30A building, where an apparent floor drain exited the building. 30A-BP2 was placed adjacent to an underground pipeline in an area of sparse undergrowth. Samples were field screened for VOCs, PAHs, PCB, and TNT.

Soil screening results for Process Area 30A are included in Table 6.5-5. VOCs, TNT, and PCB were not reported in field screening samples collected at Process Area 30A. PAHs were reported in each sample submitted for field screening, but did not exceed the full value of the NY State comparison criteria. Results for surface soil samples collected from locations B0, B100, and BP2 reported PAHs at concentrations that exceeded $1/10^{th}$ the NY State comparison criteria. Photograph 6.5-5 shows the vicinity of Building 30A.

6.5.6 Ground Scar Location 1

A 200 ft by 200 ft grid, comprised of nine sampling locations, was established across the area of the former ground scar. Along the east-west trending B line, the 200-ft row was shifted to the west to 185 ft east of the origin to avoid a soil pile that has been placed in the area by the current landowner. Samples were screened for VOCs, PAHs, PCB, and TNT.

Soil screening results for the ground scar location are included in Table 6.5-6. VOCs, TNT, and PCB were not reported in the field screening results for the samples collected at the ground scar area. PAHs were reported in each sample submitted for field screening, but reported concentrations did not exceed the full value of the NY State comparison criteria. Surface soil samples collected from locations A0, A100, B185and C100 exceeded $1/10^{th}$ of the NY State comparison criteria. The subsurface soil samples collected from locations A0 and B100 also exceeded $1/10^{th}$ of the NY State comparison criteria.

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Table 6.5-1 Component 2, Former AFP-68 Building T-1 and T-2, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-T1-SO-BP2-0.0-0.5	C2-T1-SO-BP2-13.5-14.0	C2-T1-SO-BP2-3.5-4.0	C2-T1T2-SO-A0-0.0-0.5	C2-T1T2-SO-A0-13.5-14.0	C2-T1T2-SO-A0-3.5-4.0	C2-T1T2-SO-A0-3.5-4.0-DUP	C2-T1T2-SO-A100-0.0-0.5	C2-T1T2-SO-A100-0.0-0.5-DUP	C2-T1T2-SO-A100-13.5-14.0	C2-T1T2-SO-A100-3.5-4.0	C2-T1T2-SO-A200-0.0-0.5	C2-T1T2-SO-A200-0.0-0.5-DUP	C2-T1T2-SO-A200-13.5-14.0
E4035	PAH	UG/KG	10000	NYTAGM	1185	250	352	4084	636	272	NA	300	NA	753	465	334	334	439
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM													NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-1 Component 2, Former AFP-68 Building T-1 and T-2, Summary of Detected Analytes In Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-T1-SO-BP2-0.0-0.5	C2-T1T2-SO-A200-3.5-4.0	C2-T1T2-SO-B0-0.0-0.5	C2-T1T2-SO-B0-13.5-14.0	C2-T1T2-SO-B0-3.5-4.0	C2-T1T2-SO-B100-0.0-0.5	C2-T1T2-SO-B100-0.0-0.5-DUP	C2-T1T2-SO-B100-13.5-14.0	C2-T1T2-SO-B100-3.5-4.0	C2-T1T2-SO-B200-0.0-0.5	C2-T1T2-SO-B200-13.5-14.0	C2-T1T2-SO-B200-3.5-4.0	C2-T1T2-SO-BP1-0.0-0.5	C2-T1T2-SO-BP1-13.5-14.0
E4035	PAH	UG/KG	10000	NYTAGM	1185	291	948	398	300	1372	1545	648	338	657	661	289	253	412
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM							NA							

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank [illegible]tected

Table 6.5-1 Component 2, Former AFP-68 Building T-1 and T-2, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-T1-SO-BP2-0.0-0.5	C2-T1T2-SO-BP1-13.5-14.0-DUP	C2-T1T2-SO-BP1-14-REP	C2-T1T2-SO-BP1-14.0-DUP	C2-T1T2-SO-BP1-3.5-4.0	C2-T1T2-SO-C0-0.0-0.5	C2-T1T2-SO-C0-13.5-14.0	C2-T1T2-SO-C0-3.5-4.0	C2-T1T2-SO-C100-0.0-0.5	C2-T1T2-SO-C100-0.5-REP	C2-T1T2-SO-C100-13.5-14.0	C2-T1T2-SO-C100-13.5-14.0-DUP	C2-T1T2-SO-C100-3.5-4.0	C2-T1T2-SO-C200-0.0-0.5
E4035	PAH	UG/KG	10000	NYTAGM	1185	436	425	588	355	1613	848	268	1457	15497	758	NA	298	504
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		NA		NA					0.55					

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-1 Component 2, Former AFP-68 Building T-1 and T-2, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-T1-SO-BP2-0.0-0.5	C2-T1T2-SO-C200-0.0-0.5-DUP	C2-T1T2-SO-C200-13.5-14.0	C2-T1T2-SO-C200-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	1185	648	836	366
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
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Table 6.5-2 Component 2, Former AFP-68 Building T-3, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-T3-SO-A0-0.0-0.5	C2-T3-SO-A0-13.5-14.0	C2-T3-SO-A0-3.5-4.0	C2-T3-SO-A0-3.5-4.0-DUP	C2-T3-SO-A100-0.0-0.5	C2-T3-SO-A100-13.5-14.0	C2-T3-SO-A100-3.5-4.0	C2-T3-SO-B0-0.0-0.5	C2-T3-SO-B0-0.0-0.5-DUP	C2-T3-SO-B0-13.5-14.0	C2-T3-SO-B0-3.5-4.0	C2-T3-SO-B100-0.0-0.5	C2-T3-SO-B100-13.5-14.0	C2-T3-SO-B100-3.5-4.0	C2-T3-SO-BP1-0.0-0.5
E4035	PAH	UG/KG	10000	NYTAGM	963	420	122	NA	79	593	303	441	439	606	129	2070	524	332	1048
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM									NA						0.75

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-2 Component 2, Former AFP-68 Building T-3, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-T3-SO-A0-0.0-0.5	C2-T3-SO-BP1-13.5-14.0	C2-T3-SO-BP1-3.5-4.0	C2-T3-SO-BP2-0.0-0.5	C2-T3-SO-BP2-13.5-14.0	C2-T3-SO-BP2-14-REP	C2-T3-SO-BP2-3.5-4.0	C2-T3-SO-BP2-3.5-4.0-DUP	C2-T3-SO-BP3-0.0-0.5	C2-T3-SO-BP3-13.5-14.0	C2-T3-SO-BP3-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	963	588	205	204	641	967	148	NA	708	121	121
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM						NA					

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-3 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-SO-A(-15)0-0.0-0.5	C2-3-SO-A(-15)0-13.5-14.0	C2-3-SO-A(-15)0-3.5-4.0	C2-3-SO-A(-15)100-0.0-0.5	C2-3-SO-A(-15)100-0.0-0.5-DUP	C2-3-SO-A(-15)100-13.5-14.0	C2-3-SO-A(-15)100-3.5-4.0	C2-3-SO-A200-0.0-0.5	C2-3-SO-A200-13.5-14.0	C2-3-SO-A200-3.5-4.0	C2-3-SO-A200-3.5-4.0-DUP	C2-3-SO-B0-0.0-0.5	C2-3-SO-B0-13.5-14.0	C2-3-SO-B0-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	562	332	130	1206	1212	136	158	629	977	364	407	1038	412	323
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA						NA			
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA						NA			
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				2.09	NA		2.26				NA			
GC	M & P-XYLENES	UG/KG	1200	NYTAGM					NA						NA			
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM					NA						NA			
GC	TOLUENE	UG/KG	1500	NYTAGM					NA						NA			
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM					NA						NA			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-3 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-SO-A(-15)0-0.0-0.5	C2-3-SO-B100-0.0-0.5	C2-3-SO-B100-15.5-16.0	C2-3-SO-B100-3.5-4.0	C2-3-SO-B100-3.5-4.0-DUP	C2-3-SO-B100-4-REP	C2-3-SO-B200-0.0-0.5	C2-3-SO-B200-0.0-0.5-DUP	C2-3-SO-B200-13.5-14.0	C2-3-SO-B200-3.5-4.0	C2-3-SO-BP1-0.0-0.5	C2-3-SO-BP1-13.5-14.0	C2-3-SO-BP1-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	562	4329	961	324	NA	729	608	595	697	385	4502	474	234
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM													
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM													
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM													
GC	M & P-XYLENES	UG/KG	1200	NYTAGM		71.97		59.71	68.55								
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		2.06		2.02	2.11								
GC	TOLUENE	UG/KG	1500	NYTAGM				2.11	1.27								
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM									1.41				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
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Table 6.5-3 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-SO-A(-15)0-0.0-0.5	C2-3-SO-BP2-0.0-0.5	C2-3-SO-BP2-13.5-14.0	C2-3-SO-BP2-3.3-3.8	C2-3-SO-BP3-0.0-0.5	C2-3-SO-BP3-13.5-14.0	C2-3-SO-BP3-13.5-14.0-DUP	C2-3-SO-BP3-3.5-4.0	C2-3-SO-BP4-0.0-0.5	C2-3-SO-BP4-0.0-0.5-DUP	C2-3-SO-BP4-13.5-14.0	C2-3-SO-BP4-3.5-4.0	C2-3/5-SO-C0-0.0-0.5	C2-3/5-SO-C0-0.0-0.5-DUP
E4035	PAH	UG/KG	10000	NYTAGM	562	614	193	99	354	947	NA	295	1594	1487	282	407	624	642
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM										NA				NA
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM										NA				NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM										NA				NA
GC	M & P-XYLENES	UG/KG	1200	NYTAGM										NA				NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM										NA				NA
GC	TOLUENE	UG/KG	1500	NYTAGM										NA				NA
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM										NA				NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-3 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-SO-A(-15)0-0.0-0.5	C2-3/5-SO-C0-13.5-14.0	C2-3/5-SO-C0-3.5-4.0	C2-3/5-SO-C100-0.0-0.5	C2-3/5-SO-C100-13.5-14.0	C2-3/5-SO-C100-3.5-4.0	C2-3/5-SO-C200-.5-REP	C2-3/5-SO-C200-0.0-0.5	C2-3/5-SO-C200-13.5-14.0	C2-3/5-SO-C200-3.5-4.0	C2-5-SO-BP1-0.0-0.5	C2-5-SO-BP1-0.0-0.5-DUP	C2-5-SO-BP1-13.5-14.0	C2-5-SO-BP1-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	562	866	380	2809	294	224	491	2385	723	827	339	403	269	2480
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM								1.97				NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM										0.45		NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM												NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM												NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM												NA		
GC	TOLUENE	UG/KG	1500	NYTAGM												NA		
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM										0.69		NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-3 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-SO-A(-15)0-0.0-0.5	C2-5-SO-BP2-0.0-0.5	C2-5-SO-BP2-13.5-14.0	C2-5-SO-BP2-3.5-4.0	C2-5-SO-D0-0.0-0.5	C2-5-SO-D0-13.5-14.0	C2-5-SO-D0-3.5-4.0	C2-5-SO-D100-0.0-0.5	C2-5-SO-D100-13.5-14.0	C2-5-SO-D100-2.5-3.0	C2-5-SO-D200-0.0-0.5	C2-5-SO-D200-13.5-14.0	C2-5-SO-D200-3.5-4.0	C2-5-SO-E0-0.0-0.5	C2-5-SO-E0-0.0-0.5-DUP
E4035	PAH	UG/KG	10000	NYTAGM	562	79	617	150	718	468	1428	1503	551	717	NA	NA	NA	1083	1087
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM															NA
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM															NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM															NA
GC	M & P-XYLENES	UG/KG	1200	NYTAGM															NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM															NA
GC	TOLUENE	UG/KG	1500	NYTAGM															NA
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM															NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-3 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-SO-A(-15)0-0.0-0.5	C2-5-SO-E0-13.5-14.0	C2-5-SO-E0-3.5-4.0	C2-5-SO-E100-0.0-0.5	C2-5-SO-E100-13.5-14.0	C2-5-SO-E100-3.5-4.0	C2-5-SO-E100-3.5-4.0-DUP	C2-5-SO-E200-0.0-0.5	C2-5-SO-E200-13.5-14.0	C2-5-SO-E200-3.5-4.0	C2-5-SO-E200-4-REP
E4035	PAH	UG/KG	10000	NYTAGM	562	390	388	2048	485	831	NA	NA	NA	NA	350
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM											
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM											
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM									9.21	16.81	
GC	M & P-XYLENES	UG/KG	1200	NYTAGM											
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM											
GC	TOLUENE	UG/KG	1500	NYTAGM											
GC	TRANS-1,2-DICHLOROETHEN	UG/KG	300	NYTAGM											

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank 'etected

Table 6.5-4 Component 2, Former AFP-68 Process Area 18N,
Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-18N-SO-A0-0.0-0.5	C2-18N-SO-A0-13.5-14.0	C2-18N-SO-A0-3.5-4.0	C2-18N-SO-A100-0.0-0.5	C2-18N-SO-A100-13.5-14.0	C2-18N-SO-A100-3.5-4.0	C2-18N-SO-B0-0.0-0.5	C2-18N-SO-B0-13.5-14.0	C2-18N-SO-B0-13.5-14.0-DUP	C2-18N-SO-B0-3.5-4.0	C2-18N-SO-B100-0.0-0.5	C2-18N-SO-B100-13.5-14.0	C2-18N-SO-B100-13.5-14.0-DUP	C2-18N-SO-B100-3.5-4.0	C2-18N-SO-BP1-0.0-0.5	C2-18N-SO-BP1-0.0-0.5-DUP
E4035	PAH	UG/KG	10000	NYTAGM	354	426	291	237	619	369	304	739	NA	457	400	830	NA	332	256	257

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-4 Component 2, Former AFP-68 Process Area 18N,
Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-18N-SO-A0-0.0-0.5	C2-18N-SO-BP1-13.5-14.0	C2-18N-SO-BP1-3.5-4.0	C2-18N-SO-BP1-3.5-4.0-DUP	C2-18N-SO-BP2-0.0-0.5	C2-18N-SO-BP2-0.0-0.5-DUP	C2-18N-SO-BP2-13.5-14.0	C2-18N-SO-BP2-3.5-4.0	C2-18N-SO-BP3-0.0-0.5	C2-18N-SO-BP3-0.0-0.5-DUP	C2-18N-SO-BP3-13.5-14.0	C2-18N-SO-BP3-3.5-4.0	C2-18N-SO-BP4-0.0-0.5	C2-18N-SO-BP4-11.5-12.0	C2-18N-SO-BP4-11.5-12.0-DUP	C2-18N-SO-BP4-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	354	776	177	NA	10204	NA	346	387	1368	1266	302	242	579	704	698	281

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
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Table 6.5-4 Component 2, Former AFP-68 Process Area 18N, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-18N-SO-A0-0.0-0.5	C2-18N-SO-BP4-3.5-4.0-DUP	C2-18N-SO-BP4A-0.0-0.5	C2-18N-SO-BP4A-3.5-4.0	C2-18N-SO-C0-0.0-0.5	C2-18N-SO-C0-13.5-14.0	C2-18N-SO-C0-3.5-4.0	C2-18N-SO-C100-0.0-0.5	C2-18N-SO-C100-13.5-14.0	C2-18N-SO-C100-13.5-14.0-DUP	C2-18N-SO-C100-14-REP	C2-18N-SO-C100-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	354	283	2609	783	315	193	264	252	531	492	653	273

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 6.5-5 Component 2, Former AFP-68 Process Area 30-A,
Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-30A-SO-A(+10)0-0.0-0.5	C2-30A-SO-A(+10)0-13.5-14.0	C2-30A-SO-A(+10)0-3.5-4.0	C2-30A-SO-A100-0.0-0.5	C2-30A-SO-A100-13.5-14.0	C2-30A-SO-A100-3.5-4.0	C2-30A-SO-B0-0.0-0.5	C2-30A-SO-B0-13.5-14.0	C2-30A-SO-B0-3.5-4.0	C2-30A-SO-B100-0.0-0.5	C2-30A-SO-B100-0.0-0.5-DUP	C2-30A-SO-B100-13.5-14.0	C2-30A-SO-B100-3.5-4.0	C2-30A-SO-BP1-0.0-0.5	C2-30A-SO-BP1-15.5-16.0	C2-30A-SO-BP1-16-REP
E4035	PAH	UG/KG	10000	NYTAGM	195	317	75	862	551	247	1582	366	353	944	1021	973	257	507	372	837

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-5 Component 2, Former AFP-68 Process Area 30-A, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-30A-SO-A(+10)0-0.0-0.5	C2-30A-SO-BP1-3.5-4.0	C2-30A-SO-BP1-3.5-4.0-DUP	C2-30A-SO-BP2-0.0-0.5	C2-30A-SO-BP2-0.0-0.5-DUP	C2-30A-SO-BP2-13.5-14.0	C2-30A-SO-BP2-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	195	337	NA	1284	1209	278	304

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank: ... etected

Table 6.5-6 Component 2, Former AFP-68 Ground Scar, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-GS1-SO-A0-0.0-0.5	C2-GS1-SO-A0-13.5-14.0	C2-GS1-SO-A0-3.5-4.0	C2-GS1-SO-A100-0.0-0.5	C2-GS1-SO-A100-13.5-14.0	C2-GS1-SO-A100-3.5-4.0	C2-GS1-SO-A200-0.0-0.5	C2-GS1-SO-A200-13.5-14.0	C2-GS1-SO-A200-3.5-4.0	C2-GS1-SO-B0-0.0-0.5	C2-GS1-SO-B0-15.5-16.0	C2-GS1-SO-B0-15.5-16.0 DUP	C2-GS1-SO-B0-3.5-4.0	C2-GS1-SO-B100-0.0-0.5	C2-GS1-SO-B100-13.5-14.0	C2-GS1-SO-B100-13.5-14.0-DUP
E4035	PAH	UG/KG	10000	NYTAGM	1457	1145	306	1224	899	291	911	851	318	648	730	909	409	621	1296	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.5-6 **Component 2, Former AFP-68 Ground Scar, Summary of Detected Analytes in Soil (Field-Screening Results)**

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-GS1-SO-A0-0.0-0.5	C2-GS1-SO-B100-14-REP	C2-GS1-SO-B100-3.5-4.0	C2-GS1-SO-B185-0.0-0.5	C2-GS1-SO-B185-13.5-14.0	C2-GS1-SO-B185-3.5-4.0	C2-GS1-SO-C0-0.0-0.5	C2-GS1-SO-C0-0.0-0.5-DUP	C2-GS1-SO-C0-13.5-14.0	C2-GS1-SO-C0-3.5-4.0	C2-GS1-SO-C100-0.0-0.5	C2-GS1-SO-C100-0.0-0.5-DUP	C2-GS1-SO-C100-13.5-14.0	C2-GS1-SO-C100-3.5-4.0	C2-GS1-SO-C200-0.0-0.5	C2-GS1-SO-C200-13.5-14.0
E4035	PAH	UG/KG	10000	NYTAGM	1457	592	379	6522	971	458	397	727	213	301	1190	1066	411	439	978	944

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank ·tected

Table 6.5-6 Component 2, Former AFP-68 Ground Scar, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-GS1-SO-A0-0.0-0.5	C2-GS1-SO-C200-3.5-4.0
E4035	PAH	UG/KG	10000	NYTAGM	1457	202

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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6.6 LABORATORY ANALYSES AND CONFIRMATORY SOIL SAMPLE RESULTS

6.6.1 Temporary Buildings T-1 & T-2

Due to the reported presence of TCE at location C100 and the potential for presence of COPC at BP1, these locations were revisited. Additional samples were re-collected from the target interval, re-screened, and submitted for confirmatory laboratory analysis of full TCL/TAL analytes, boron, lithium, and explosives. Soil screening results for confirmatory samples at T-1 and T-2 are included in Table 6.5-1. Laboratory analytical sample results for confirmatory samples at T-1 and T-2 are included in Table 6.6-1.

Re-screening Results

Although the re-collected surface soil sample from C100 was from the same interval as the original screening sample, TCE was not reported in the second sample. However, PAHs were reported above the full value of the NY State comparison criteria in the re-collected sample. PAHs did not exceed 1/10th of the criteria in the sample re-collected from location BP1. TNT, PCB and VOCs were not reported in the re-collected samples.

Laboratory Analytical Results

Antimony, iron, and chromium were reported at concentrations exceeding the full value of the NY State comparison criteria in the surface soil sample collected from location C100. Antimony was reported at 1.2 mg/kg, iron at 14,200 mg/kg, and chromium at 77.4 mg/kg. Several additional metals were reported at sample location C100 at concentrations exceeding 1/10th the NY State comparison criteria.

In addition, several PAHs were reported in concentrations exceeding the full value of the NY State comparison criteria. Heptachlor epoxide exceeded 1/10th of the NY State comparison criteria. Additional pesticides, PAHs, and cyanide were reported in the sample collected from C100 in concentrations that did not exceed 1/10th NY State comparison criteria. VOCs, PCB, and explosives were not reported in the sample collected from C100.

Iron was reported at a concentration exceeding the full value of the NY State comparison criteria in the subsurface soil sample collected from location BP1. Several additional metals were reported at concentrations exceeding 1/10th the NY State comparison criteria. PAHs and pesticides were reported at concentrations that did not exceed 1/10th of the criteria. VOCs, PCB, cyanide, and explosives were not reported in the sample collected from BP1.

A ground-water producing zone was not encountered during direct push soil sampling. Therefore, a ground-water sample was not collected from the T-1/T-2 area.

6.6.2 Temporary Building T-3

BP2 was located in an area with a high potential for impact from COPC, and was therefore revisited. A subsurface soil sample was re-collected, screened, and submitted for confirmatory laboratory analysis of DOD marker compounds. Soil screening results for confirmatory samples at T-3 are included in Table 6.5-2. Laboratory analytical sample results for confirmatory samples at T-3 are included in Table 6.6-2.

Re-screening Results

PAHs were reported in the re-collected field-screened sample from location BP2, but at concentrations that did not exceed 1/10th of the NY State comparison criteria. VOCs, TNT, and PCB were not reported in the re-collected sample.

Laboratory Analytical Results

Although NY State comparison criteria do not exist for boron and lithium, the reported concentrations did not appear to be elevated in comparison to the concentrations of boron and lithium reported in samples collected from other areas during this Phase I investigation. Explosives were not reported in the sample collected from BP2.

A ground-water producing zone was not encountered during direct push soil sampling. Therefore, a ground-water sample was not collected from the T-3 area.

6.6.3 Process Areas 3 & 5

Due to the reported presence of VOCs, grid locations B100, C200, and E200 were revisited. Additional samples were re-collected from the target interval, screened, and submitted for confirmatory laboratory analysis. Samples collected from Process Area 5 (C200 and E200) were submitted for analysis of TCL/TAL analytes, boron, lithium, and explosives. Samples collected from Process Area 3 (B100) were submitted for analysis of DOD marker compounds. Soil screening results for confirmatory samples at Process Areas 3 and 5 are included in Table 6.5-3. Laboratory analytical sample results for confirmatory samples at Process Areas 3 and 5 are included in Table 6.6-3.

Re-screening Results

PAHs were reported in the field-screened samples at concentrations that did not exceed 1/10th of the NY State comparison criteria. VOCs, TNT, and PCB were not reported.

Laboratory Analytical Results

Several metals, pesticides, PAHs were reported in the samples collected from locations C200 and E200; however only the iron concentrations exceeded the full value of the NY State comparison criteria. Additional metals concentrations at C200 and E200 were reported at concentrations exceeding 1/10th the NY State comparison criteria. Boron and lithium were reported at location B100. Although NY State comparison criteria do not exist for boron and lithium, the reported concentrations did not appear to be elevated in comparison to the concentrations of boron and lithium reported in samples collected from other areas during this Phase I investigation. .VOC, PCB, explosives, and cyanide were not reported in the soil samples collected from Process Areas 3 and 5.

Ground-Water Sampling Results

Due to the presence and concentration of potential COPC in field screening and the stratigraphy indicating the presence of a water-bearing zone, 2-in. temporary ground-water sampling points were installed at grid location B100 in Process Area 3 and E200 in Process Area 5. The screening intervals were between 4 to 14 ft bgs in a zone of moist to wet clayey silt. Ground-water samples were collected from each temporary well point and submitted for laboratory analysis of DOD marker compounds for B100 and full suite parameters for E200. A summary of reported analytes is presented in Table 6.6-4.

Antimony, iron, and sodium were reported in concentrations exceeded the NY State comparison criteria in the ground-water sample collected from E200. Additional metals exceeded 1/10th of the comparison criteria. Although a NY State comparison criteria does not exist for lithium, the reported concentration of lithium in the ground-water sample collected from E200 was elevated in comparison to concentrations reported in other samples collected during this Phase I investigation. Heptachlor epoxide, for which the screening criteria is zero, was reported at a concentration of 0.0067 μg/L. The reported concentrations of 1,2-DCE, chloromethane, vinyl chloride, and 1,3,5-TNB exceeded 1/10th of the NY State comparison criteria in the sample collected from E200. SVOCs, PAH, PCB and cyanide were not reported in the ground-water sample collected from E200.

Although NY State comparison criteria do not exist for boron and lithium, the concentrations reported in the ground water sample collected from location B100 did not appear to be elevated in comparison to the concentrations of boron and lithium reported in samples collected from other areas during this Phase I investigation. The explosive 2,4-dinitrotoluene was reported at location B100 in concentrations that did not exceed screening criteria. RDX was reported in concentrations exceeding the NY State comparison criteria.

6.6.4 Process Area 18N

Due to the potential presence of COPC and the presence of a potential water-producing zone, C100 was revisited. Additional samples were re-collected, screened, and submitted for confirmatory laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives. Soil screening results for the confirmatory sample at Process Area 18N are included in Table 6.5-4. Laboratory analytical sample results for the confirmatory sample at Process Area 18N are included in Table 6.6-5.

<u>Re-screening Results</u>

PAHs were reported in field-screened samples at concentrations below 1/10th of the NY State comparison criteria. VOCs, TNT, and PCB were not reported in the re-screening results.

<u>Laboratory Analytical Results</u>

Several metals and one pesticide, heptachlor, were reported in the subsurface soil sample collected from sample location C100. The iron concentration exceeded the full value of the NY State comparison criteria. Several additional metals were reported at concentrations exceeding 1/10th the NY State comparison criteria. VOCs, SVOCs, PAHs, PCB, explosives, and cyanide were not reported in the soil sample collected from Area 18N.

Ground-Water Sampling Results

Due to the stratigraphy indicating the presence of a water-bearing zone, a 2-in. temporary ground-water sampling point was installed at grid location C100. The screening interval was between 4 to 14 ft bgs and included a lens of saturated fine sand. A ground-water sample was collected and submitted for laboratory analysis of full TCL/TAL analytes, boron, lithium, and explosives. A summary of reported analytes is presented in Table 6.6-6.

The reported concentrations of iron, magnesium and sodium exceeded the NY State ground-water comparison criteria. Endrin, which has a comparison criteria of zero, was reported at 0.02 µg/L. VOCs, SVOCs, PAHs, pesticides, PCB, explosives and cyanide were not reported.

6.6.5 Process Area 30A

Due to the potential presence of COPC, BP1 was revisited. An additional subsurface soil sample was collected, screened, and submitted for confirmatory laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives at Process Area 30A. Soil screening results for confirmatory samples at Process Areas 30A are included in Table 6.5-5. Laboratory analytical sample results for confirmatory samples at Process Areas 30A are included in Table 6.6-7.

Re-screening Results

PAHs were reported in the field-screened sample at concentrations below 1/10th of the NY State comparison criteria. VOCs, TNT, and PCB were not reported.

Laboratory Analytical Results

Several metals, pesticides, and PAHs were reported in the subsurface soil sample collected from location BP1. Antimony and iron concentrations exceeded the full value of the NY State comparison criteria. Several additional metals were reported at this sample location at concentrations exceeding 1/10th the NY State comparison criteria.. PAHs and pesticides were reported at concentrations below NY State comparison criteria. VOCs, SVOCs, PCB, explosives and cyanide were not reported.

Ground-Water Sampling Results

Due to the stratigraphy indicating the presence of a water-bearing zone, a 2-in. temporary ground-water sampling point was installed at sample location BP1. The screening interval was between 4 to 14 ft bgs and included a zone of moist to wet silt. A ground-water sample was collected and submitted for laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives. A summary of reported analytes is presented in Table 6.6-8.

The reported concentrations of iron, magnesium, and sodium exceeded the NY State comparison criteria. VOCs, SVOCs, PAHs, PCB, explosives, and cyanide were not reported.

6.6.6 Ground Scar Location 1

Due to its location in the center of the historical area of ground-scarring, grid location B100 was revisited. An additional subsurface soil sample was collected, screened, and submitted for confirmatory laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives. Soil screening results for confirmatory samples at the ground scar location are included in Table 6.5-6. Laboratory analytical sample results for confirmatory samples at the ground scar location are included in Table 6.6-9.

Re-screening Results

PAHs were reported in B100 at concentrations that did not exceed 1/10th of the NY State comparison criteria. VOCs, TNT, and PCB were not reported in the field-screened sample.

Laboratory Analytical Results

The iron concentration reported for the subsurface soil sample collected from location B100 exceeded the full value of the NY State comparison criteria. Several additional metals were reported at this sample location at concentrations exceeding 1/10th the NY State comparison criteria. Heptachlor and phenanthrene were reported at concentrations below 1/10th of the NY State comparison criteria. VOCs, SVOCs, PCB, explosives and cyanide were not reported.

A ground-water producing zone was not encountered during direct push soil sampling. Therefore, a ground-water sample was not collected from the ground scar location.

Table 6.6-1 Component 2, Former AFP-68 Building T-1 and T-2, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-T1T2-SO-BP1-14-REP	C2-T1T2-SO-C100-0.5-REP
E160.3	PERCENT MOISTURE	%			11.4	13.8
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	7770 *	13000 *
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.38 BN*	1.2 N*
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	2.5	1.3
SW6010	BARIUM	MG/KG	300	NYTAGM	85.5	158
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.27 B	0.89
SW6010	BORON	MG/KG			2.1 B	2.7 B
SW6010	CALCIUM	MG/KG			53700	41600
SW6010	CHROMIUM	MG/KG	50	NYTAGM	12.1 *	77.4 *
SW6010	COBALT	MG/KG	30	NYTAGM	7.2	5 B
SW6010	COPPER	MG/KG	50	NYTAGM-BG	23.4 N	27.3 N
SW6010	IRON	MG/KG	2000	NYTAGM	18900	14200
SW6010	LEAD	MG/KG	400	NYTAGM	4.3 *	15.8 *
SW6010	LITHIUM	MG/KG			20.1 *	19.3 *
SW6010	MAGNESIUM	MG/KG			8740	14600
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	664	504
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	15.5 *	14.6 *
SW6010	POTASSIUM	MG/KG			1460 *	949 *
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG	0.39 B	0.66
SW6010	SODIUM	MG/KG			182	403
SW6010	VANADIUM	MG/KG	150	NYTAGM	13.9	16.9
SW6010	ZINC	MG/KG	76	NYTAGM-BG	37.6 N*	56.5 N*
SW8081	4,4'-DDD	UG/KG	2900	NYTAGM		1.2 P
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM		3.2 P
SW8081	ALDRIN	UG/KG	41	NYTAGM		2.7 P
SW8081	ENDOSULFAN SULFATE	UG/KG	1000	NYTAGM		1.7 P
SW8081	ENDRIN	UG/KG	100	NYTAGM		1.1

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

Table 6.6-1 Component 2, Former AFP-68 Building T-1 and T-2, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-T1T2-SO-BP1-14-REP	C2-T1T2-SO-C100-0.5-REP
SW8081	ENDRIN KETONE	UG/KG				4.2 P
SW8081	GAMMA-CHLORDANE	UG/KG	540	NYTAGM		1.4 P
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	0.53 P	0.42 P
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM	0.22 P	5.7 P
SW8270C	BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	50000	NYTAGM		430
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM		2500
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM		180
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM		650 D
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM		600 D
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	2.9	680 D
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	2.4	330
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM		330 D
SW8310	CHRYSENE	UG/KG	400	NYTAGM		420 D
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM		53
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	2.5	1400 D
SW8310	FLUORENE	UG/KG	50000	NYTAGM		130
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM		220
SW8310	NAPHTHALENE	UG/KG	13000	NYTAGM		20
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	3.6	540 D
SW8310	PYRENE	UG/KG	50000	NYTAGM	1.9	1000 D
SW9012	CYANIDE	MG/KG				1.5

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = n[illegible] analyzed
blank [illegible]tected

Table 6.6-2 Component 2, Former AFP-68 Building T-3, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-T3-SO-BP2-14-REP
SW6010	BORON	MG/KG			9.2 B
SW6010	LITHIUM	MG/KG			24.4

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 6.6-3 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-SO-B100-4-REP	C2-3/5-SO-C200-.5-REP	C2-5-SO-E200-4-REP
E160.3	PERCENT MOISTURE	%			NA	11.8	13.7
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	NA	7590 *	9910 *
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	NA	0.52 BN*	0.54 BN*
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	NA	3.2	3
SW6010	BARIUM	MG/KG	300	NYTAGM	NA	74.3	86.2
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	NA	0.31 B	0.75
SW6010	BORON	MG/KG			2.3 B		3.1 B
SW6010	CALCIUM	MG/KG			NA	37200	67600
SW6010	CHROMIUM	MG/KG	50	NYTAGM	NA	24.5 *	15.1 *
SW6010	COBALT	MG/KG	30	NYTAGM	NA	6.6	7
SW6010	COPPER	MG/KG	50	NYTAGM-BG	NA	27.3 N	24.2 N
SW6010	IRON	MG/KG	2000	NYTAGM	NA	19100	19200
SW6010	LEAD	MG/KG	400	NYTAGM	NA	5.4 *	4.8 *
SW6010	LITHIUM	MG/KG			13.7	14.3 *	26.9 *
SW6010	MAGNESIUM	MG/KG			NA	5710	8510
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	NA	653	659
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	NA	12.9 *	14 *
SW6010	POTASSIUM	MG/KG			NA	738 *	953 *
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG	NA		0.86
SW6010	SODIUM	MG/KG			NA	135	224
SW6010	VANADIUM	MG/KG	150	NYTAGM	NA	15.8	16
SW6010	ZINC	MG/KG	76	NYTAGM-BG	NA	37.2 N*	37.3 N*
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	NA	0.67	
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM	NA	1 P	
SW8270C	BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	50000	NYTAGM	NA		1100
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM	NA		0.8
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM	NA		2.3

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.6-3 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-SO-B100-4-REP	C2-3/5-SO-C200-.5-REP	C2-5-SO-E200-4-REP
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	NA	1.5	4.1
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	NA		2.9
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	NA	0.53	1
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	NA	1.4	4
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	NA	0.76	3.4
SW8310	PYRENE	UG/KG	50000	NYTAGM	NA	1.1	3.7

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.6-4 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-GW-B100	C2-5-GW-E200
SW6010	ALUMINUM	D	UG/L			NA	69.4 B
SW6010	ALUMINUM	T	UG/L			NA	821
SW6010	ANTIMONY	D	UG/L	3	NYGUIDANCE	NA	2.1 B
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	NA	3 B
SW6010	ARSENIC	D	UG/L	25	NYSTANDARD	NA	3.3 B
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD	NA	5.1 B
SW6010	BARIUM	D	UG/L	1000	NYSTANDARD	NA	23.3 B
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	NA	27.2 B
SW6010	BORON	D	UG/L	1000	NYSTANDARD	24 B	83.3 B
SW6010	BORON	T	UG/L	1000	NYSTANDARD	21.2 B	93.8 B
SW6010	CALCIUM	D	UG/L			NA	50600
SW6010	CALCIUM	T	UG/L			NA	51100
SW6010	CHROMIUM	D	UG/L	50	NYSTANDARD	NA	10.5
SW6010	CHROMIUM	T	UG/L	50	NYSTANDARD	NA	14.3
SW6010	COPPER	D	UG/L	200	NYSTANDARD	NA	3.9 B
SW6010	COPPER	T	UG/L	200	NYSTANDARD	NA	11
SW6010	IRON	T	UG/L	300	NYSTANDARD	NA	3080
SW6010	LEAD	T	UG/L	25	NYSTANDARD	NA	1.2 BE
SW6010	LITHIUM	D	UG/L			14.1	143
SW6010	LITHIUM	T	UG/L			15.2	145
SW6010	MAGNESIUM	D	UG/L	35000	NYSTANDARD	NA	21300
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	NA	21200
SW6010	MANGANESE	D	UG/L	300	NYSTANDARD	NA	8.8 B
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	NA	24.4
SW6010	POTASSIUM	D	UG/L			NA	2540
SW6010	POTASSIUM	T	UG/L			NA	2770
SW6010	SELENIUM	D	UG/L	10	NYSTANDARD	NA	4.1 B

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.6-4 Component 2, Former AFP-68 Process Areas 3 and 5, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-3-GW-B100	C2-5-GW-E200
SW6010	SELENIUM	T	UG/L	10	NYSTANDARD	NA	6.5
SW6010	SODIUM	D	UG/L	20000	NYSTANDARD	NA	23800
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	NA	24900
SW8081	HEPTACHLOR EPOXID	N	UG/L	0	NYSTANDARD	NA	0.0067
SW8260B	1,2-DICHLOROETHENE,	N	UG/L	5	NYSTANDARD	NA	1
SW8260B	CHLOROMETHANE	N	UG/L	5	NYGUIDANCE	NA	0.6 J
SW8260B	VINYL CHLORIDE	N	UG/L	5	NYSTANDARD	NA	1
SW8330	1,3,5-TRINITROBENZEN	N	UG/L	5	NYSTANDARD		0.52
SW8330	2,4-DINITROTOLUENE	N	UG/L	5	NYSTANDARD	0.1	
SW8330	RDX	N	UG/L	3.2	NYGUIDANCE	4.4	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
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Table 6.6-5 Component 2, Former AFP-68 Process Area 18N, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-18N-SO-C100-14-REP
E160.3	PERCENT MOISTURE	%			11.5
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	7740
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.55 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	3
SW6010	BARIUM	MG/KG	300	NYTAGM	209
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.26 B
SW6010	BORON	MG/KG			4.1 B
SW6010	CALCIUM	MG/KG			69100
SW6010	CHROMIUM	MG/KG	50	NYTAGM	13.1
SW6010	COBALT	MG/KG	30	NYTAGM	7.3
SW6010	COPPER	MG/KG	50	NYTAGM-BG	26.3
SW6010	IRON	MG/KG	2000	NYTAGM	19600
SW6010	LEAD	MG/KG	400	NYTAGM	4.7 *
SW6010	LITHIUM	MG/KG			19
SW6010	MAGNESIUM	MG/KG			17600 N
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	724
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	16
SW6010	POTASSIUM	MG/KG			1600
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG	1.1
SW6010	SILVER	MG/KG	4.9	NYTAGM-BG	1.1
SW6010	SODIUM	MG/KG			245
SW6010	VANADIUM	MG/KG	150	NYTAGM	14.4 E
SW6010	ZINC	MG/KG	76	NYTAGM-BG	36.6 N
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	0.46 P
SW9060	TOTAL ORGANIC CARBON	MG/KG			6870

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 6.6-6 Component 2, Former AFP-68 Process Area 18N, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-18N-GW-C100
SW6010	ALUMINUM	D	UG/L			124 B
SW6010	ALUMINUM	T	UG/L			616
SW6010	ANTIMONY	D	UG/L	3	NYGUIDANCE	2 B
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	1.7 B
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD	5.3 B
SW6010	BARIUM	D	UG/L	1000	NYSTANDARD	30.9 B
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	36.2 B
SW6010	BORON	D	UG/L	1000	NYSTANDARD	183
SW6010	BORON	T	UG/L	1000	NYSTANDARD	256
SW6010	CALCIUM	D	UG/L			108000
SW6010	CALCIUM	T	UG/L			108000 E*
SW6010	COPPER	T	UG/L	200	NYSTANDARD	3.2 B
SW6010	IRON	T	UG/L	300	NYSTANDARD	2520 E*
SW6010	LITHIUM	D	UG/L			66.4
SW6010	LITHIUM	T	UG/L			69.1
SW6010	MAGNESIUM	D	UG/L	35000	NYSTANDARD	208000
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	208000 *
SW6010	MANGANESE	D	UG/L	300	NYSTANDARD	183
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	178 *
SW6010	POTASSIUM	D	UG/L			6320
SW6010	POTASSIUM	T	UG/L			6310 *
SW6010	SELENIUM	D	UG/L	10	NYSTANDARD	2.5 B
SW6010	SILVER	D	UG/L	50	NYSTANDARD	1 B
SW6010	SODIUM	D	UG/L	20000	NYSTANDARD	140000
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	137000 *
SW8081	ENDRIN	N	UG/L	0	NYSTANDARD	0.02 P

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 6.6-7 Component 2, Former AFP-68 Process Area 30-A, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-30A-SO-BP1-16-REP
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	9670
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.62 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	3.3
SW6010	BARIUM	MG/KG	300	NYTAGM	99.5
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.35 B
SW6010	BORON	MG/KG			4.8 B
SW6010	CALCIUM	MG/KG			54000
SW6010	CHROMIUM	MG/KG	50	NYTAGM	15.9
SW6010	COBALT	MG/KG	30	NYTAGM	8.2
SW6010	COPPER	MG/KG	50	NYTAGM-BG	32.2
SW6010	IRON	MG/KG	2000	NYTAGM	23100
SW6010	LEAD	MG/KG	400	NYTAGM	6.1 *
SW6010	LITHIUM	MG/KG			21.7
SW6010	MAGNESIUM	MG/KG			9740 N
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	759
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	18.3
SW6010	POTASSIUM	MG/KG			1680
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG	1
SW6010	SILVER	MG/KG	4.9	NYTAGM-BG	0.62 B
SW6010	SODIUM	MG/KG			196
SW6010	VANADIUM	MG/KG	150	NYTAGM	18.8 E
SW6010	ZINC	MG/KG	76	NYTAGM-BG	44.1 N
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG	0.11 B
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	0.43 P
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM	0.16 P
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	1.9
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	1.7

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.6-7 *Component 2, Former AFP-68 Process Area 30-A,* Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-30A-SO-BP1-16-REP
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	0.91
SW8310	CHRYSENE	UG/KG	400	NYTAGM	0.79
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	2.4
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	1.7

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 6.6-8 Component 2, Former AFP-68 Process Area 30-A, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-30A-GW-BP1	C2-30A-GW-BP1-DUP
SW6010	ALUMINUM	D	UG/L			182 B	73.4 B
SW6010	ALUMINUM	T	UG/L			404	292
SW6010	ANTIMONY	D	UG/L	3	NYGUIDANCE		2.1 B
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	2 B	1.4 B
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD	3.3 B	3 B
SW6010	BARIUM	D	UG/L	1000	NYSTANDARD	55.1 B	47.2 B
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	61.8 B	48.7 B
SW6010	BORON	D	UG/L	1000	NYSTANDARD	65.6 B	59.8 B
SW6010	BORON	T	UG/L	1000	NYSTANDARD	121	64.1 B
SW6010	CALCIUM	D	UG/L			70100	65700
SW6010	CALCIUM	T	UG/L			71800 E*	66800
SW6010	COPPER	T	UG/L	200	NYSTANDARD		4.1 B
SW6010	IRON	D	UG/L	300	NYSTANDARD	218	
SW6010	IRON	T	UG/L	300	NYSTANDARD	2220 E*	715
SW6010	LEAD	T	UG/L	25	NYSTANDARD		4.8 E
SW6010	LITHIUM	D	UG/L			51	54.5
SW6010	LITHIUM	T	UG/L			54.8	59.1
SW6010	MAGNESIUM	D	UG/L	35000	NYSTANDARD	127000	128000
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	131000 *	132000
SW6010	MANGANESE	D	UG/L	300	NYSTANDARD	111	88
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	114 *	92.9
SW6010	POTASSIUM	D	UG/L			4120	3470
SW6010	POTASSIUM	T	UG/L			4150 *	3470
SW6010	SELENIUM	D	UG/L	10	NYSTANDARD	3.8 B	
SW6010	SELENIUM	T	UG/L	10	NYSTANDARD		6.3
SW6010	SILVER	D	UG/L	50	NYSTANDARD		1.1 B
SW6010	SODIUM	D	UG/L	20000	NYSTANDARD	53100	50400

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.6-8 Component 2, Former AFP-68 Process Area 30-A, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-30A-GW-BP1	C2-30A-GW-BP1-DUP
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	52500 *	51200

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 6.6-9 Component 2, Former AFP-68 Ground Scar, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C2-GS1-SO-B100-14-REP
E160.3	PERCENT MOISTURE	%			11.8
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	8820
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.48 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	3.7
SW6010	BARIUM	MG/KG	300	NYTAGM	83.9
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.32 B
SW6010	BORON	MG/KG			4.6 B
SW6010	CALCIUM	MG/KG			49500
SW6010	CHROMIUM	MG/KG	50	NYTAGM	13
SW6010	COBALT	MG/KG	30	NYTAGM	8.6
SW6010	COPPER	MG/KG	50	NYTAGM-BG	30
SW6010	IRON	MG/KG	2000	NYTAGM	22200
SW6010	LEAD	MG/KG	400	NYTAGM	5 *
SW6010	LITHIUM	MG/KG			20.4
SW6010	MAGNESIUM	MG/KG			9890 N
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	741
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	17.5
SW6010	POTASSIUM	MG/KG			1700
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG	1.2
SW6010	SILVER	MG/KG	4.9	NYTAGM-BG	0.51 B
SW6010	SODIUM	MG/KG			212
SW6010	VANADIUM	MG/KG	150	NYTAGM	17.2 E
SW6010	ZINC	MG/KG	76	NYTAGM-BG	42.5 N
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	0.44 P
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	1.2

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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6.7 CONCLUSIONS AND RECOMMENDATIONS

Total PAH concentrations exceeding $1/10^{th}$ of the NY State comparison criteria were reported in the surface soil and semi-subsurface soil (2 to 4 ft bgs) at several locations within Component 2. These elevated PAHs are likely from deteriorating road surfaces and grading activities within Component 2 and are not recommended for further investigation. However, total PAH concentrations exceeding $1/10^{th}$ of the NY State comparison criteria were reported in the subsurface soil samples from location C100 at T-1/T-2, and in the semi-subsurface soil samples collected from D0 and 5-BP1 in Area 5. In addition, concentrations of total PAHs exceeded the full value of the comparison criteria in the surface soil sample collected from sample location BP2 in Area 18N. It is expected that the reported concentration of PAHs in location BP2 at Area 18N is associated with the railroad bed in that area. However, this should be confirmed. Therefore, the elevated PAHs discussed above are recommended for further investigation.

Elevated PAHs were also reported in the subsurface soil in the former Ground Scar area. Review of results indicate that total PAHs were the only potential COPC reported and the results were not confirmed by laboratory analysis. In addition, this area was not associated with any process that would be expected to have a potential impact. Therefore, the former Ground Scar area is not recommended for further investigation.

With the exception of the elevated chromium concentration reported in the surface soil sample collected from location C100 in Area T1/T and the elevated lithium reported in the ground-water sample collected from location E200 in Area 5, the metals concentrations reported in the soil and ground-water samples collected from within Component 2 appear to be indicative of site-specific background concentrations. However, a background metals concentration evaluation is recommended to more completely evaluate the reported metals concentrations. The elevated lithium and chromium concentrations reported in the samples may indicate a possible impact and are recommended for further investigation.

Due to the reported concentration of the explosive, RDX, in the ground-water sample collected from sample location B100 within Area 3, it is recommended that the ground water in the vicinity of B100 be further investigated. In addition, it is recommended that the analyte list be expanded to include TCL/TAL analytes for possible future investigations within Area 3.

Additional investigations within Component 2 should consider the elevated potential COPC reported in the PCA (Acres 1992). Review of the results of the PCA indicates elevated metals (chromium), PCBs, and PAHs within Areas 3 and 5. The elevated potential COPC were reported in PCA sampling locations: PCA-SS-3-1, PCA-SS-3-3, PCA-SS-3-4, PCA-SS-5-1, PCA-SS-5-2, PCA-SS-5-3, PCA-SS-5-4, and PCA-18N-3. These elevated potential COPC are recommended for further investigation.

In addition to the areas described above, it is also recommended that Process Area 6 and the rubble pile within Area 30A be further investigated. Results of the PCA reported elevated chromium concentrations west of Building 6-01 and elevated PAH concentrations north of Building 6-01 (Acres 1992). Additionally, results of sampling conducted by the NYSDEC indicate elevated PCBs in an area north of Building 6-01 (Johnson 1999).

In summary, the following areas in Component 2 are recommended for further investigation

- Area T-1/T-2 for metals in soil
- Location C100 within Area T-1/T-2 for metals and PAH in soil
- Location E200 in Process Areas 5 for elevated lithium concentration in ground water
- Location B100 in Process Areas 3 for explosives in ground water
- PCA sample locations SS-3-1, SS-3-3, SS-3-4, SS-5-1 through SS-5-4 in Process Areas 3 and 5 due to potential COPC (i.e. chromium, PCB, PAHs)
- Location BP2 in Process Area 18N for PAHs in soil
- PCA sample location SS-18N-3 due to elevated PAHs
- The rubble pile in Process Area 30A due to the potential for COPC
- Process Area 6 due to potential COPC

7. COMPONENT 3 (TOWN OF LEWISTON) DATA RESULTS AND EVALUATION

7.1 FORMER LOOW WASTEWATER TREATMENT PLANT (WWTP)

7.1.1 Site Background

The former LOOW Wastewater Treatment Plant (WWTP) is presently owned by the Town of Lewiston (Component 3). The WWTP parcel is bordered by CWM property to the north and east, NFSS property to the south, and a Niagara Mohawk power easement to the west.
The former LOOW WWTP treated wastewater from LOOW operations, as well as wastes from other facilities including the Navy IPPP, AFP–68, AFP–38, the NIKE base, and the Boron-10 plant (EA 1998a). Because the former WWTP also potentially received waste from non-DOD sources, the area surrounding the structures were investigated with respect to constituents specific to DOD site use only.

7.1.2 Field Reconnaissance and Surface Features

In general, the former LOOW WWTP structures are still present on site, though they have severely deteriorated. Former WWTP structures include a pumping station, an Imhoff tank, two sludge beds, a Venturi vault, a chlorination pit, an acid neutralization building, a collection tank, and a final mixing tank (Figure 7.1-1). The tanks are filled with debris, sediment, and water. Subsurface structures, such as sewer and transfer lines, remain in place and range in depth from approximately 4 ft to 15 ft bgs. Other than the remnant roads, the majority of the area is characterized by grass and scrub brush. The current asphalt access road, heavily used by CWM to transport soil from a nearby borrow pit, runs between the acid neutralization building and the northernmost sludge bed. A temporary improvement of the roadbed by CWM has been accomplished by layering additional clay onto the road surface. There is a deteriorated fence trending east-west just north of the acid neutralization building. An area of black discoloration was observed on the surface soil along the fence, west northwest of the neutralization building (Photograph 7.1-1).

7.1.3 Soil Sampling Program

During the Phase I RI, field activities at the former LOOW WWTP included collection of surface soil, subsurface soil, and ground-water samples. The ground-water sampling program is discussed in Section 7.1.7.

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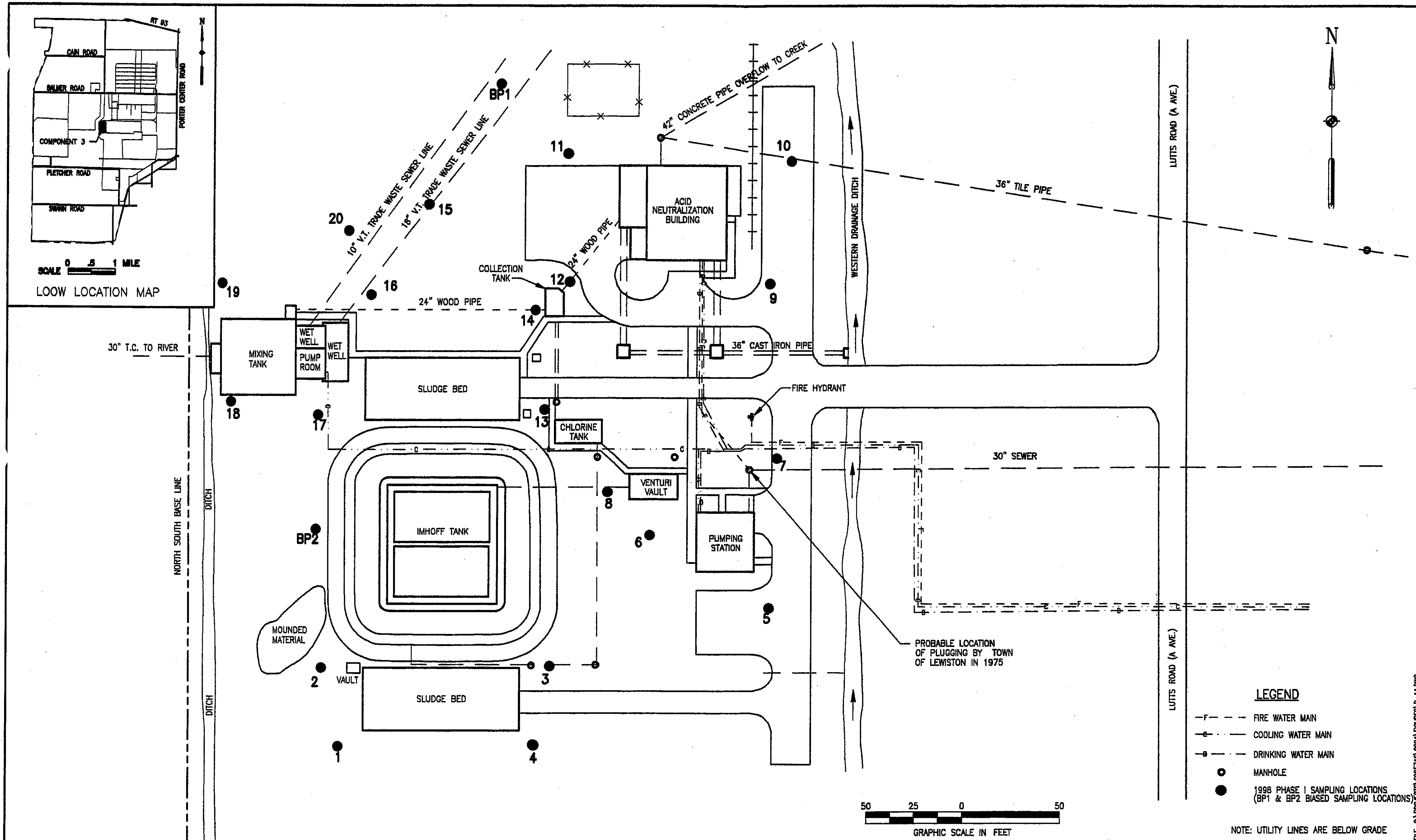

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

COMPONENT 3 – TOWN OF LEWISTON
FORMER LOOW WASTE WATER TREATMENT PLANT
SAMPLING POINT LOCATIONS

DESIGNED BY	DRAWN BY	DATE	PROJECT NO.	FILE NAME
DAB	JBS	MAY 1999	60957.46	B-14
CHECKED BY	PROJECT MGR.	SCALE	DRAWING NO.	FIGURE
SMS	HGP	AS SHOWN	–	7.1-1

Twenty field screening locations were established across the site (Figure 7.1–1) adjacent to and between WWTP structures. Sample locations were given numeric designations, as detailed in the SAPs. In addition, two additional biased sampling locations were established within the area. The first location, BP1, was located west of the acid neutralization building in a discolored, dry drainage area (Photograph 7.1-1). BP2 was located west of the Imhoff tank.

Photograph 7.1-1. Photograph of discolored, dry drainage located northwest of the Acid Neutralization building. Location of biased sampling point C3-WWTP-SO-BP1.

Direct push technology was used to perform sampling at each sampling location. Surface soil samples, ranging in depth from 0 to 0.9 ft bgs, and subsurface soil samples, ranging in depth from 4 ft to 17 ft bgs, were collected from each location. Soil samples were field screened for VOCs, PAHs, PCB, and TNT.

Soil field screening results were reviewed to designate locations for collection of laboratory confirmatory samples. Those screening locations exhibiting the highest level of elevated concentrations of COPC were revisited. Additional samples were collected, screened, and submitted for confirmatory laboratory analysis as discussed in Sections 7.1.5 and 7.1.6.

7.1.4 Site Stratigraphy

7.1.4.1 Surface Soil

Typical surface samples (0 to 0.9 ft bgs) consisted of a mixture of gravel, topsoil, upper clay till, and fine sand or silt. Due to previous site use, recent road improvements, and proximity of the road it has been assumed that portions of the surface layers have been heavily graded.

7.1.4.2 Subsurface Stratigraphy

Two borings to be used to describe the full lithology were installed at the site, at location 20 to the west and location 7 to the east. The dry, stiff UCT layer was encountered from near the surface (at location 20) to 18 ft bgs, where it transitioned into the GLC (Figure 7.1-2). A wet zone (upper silt till) was not observed at the contact between the UCT and GLC. In location 7, a significant wet zone was encountered below the UCT, from 10 ft to 15 ft bgs. The wet layer may be classified as the upper silt till, composed of loose silt, fine sand, and gravel. The layer had a

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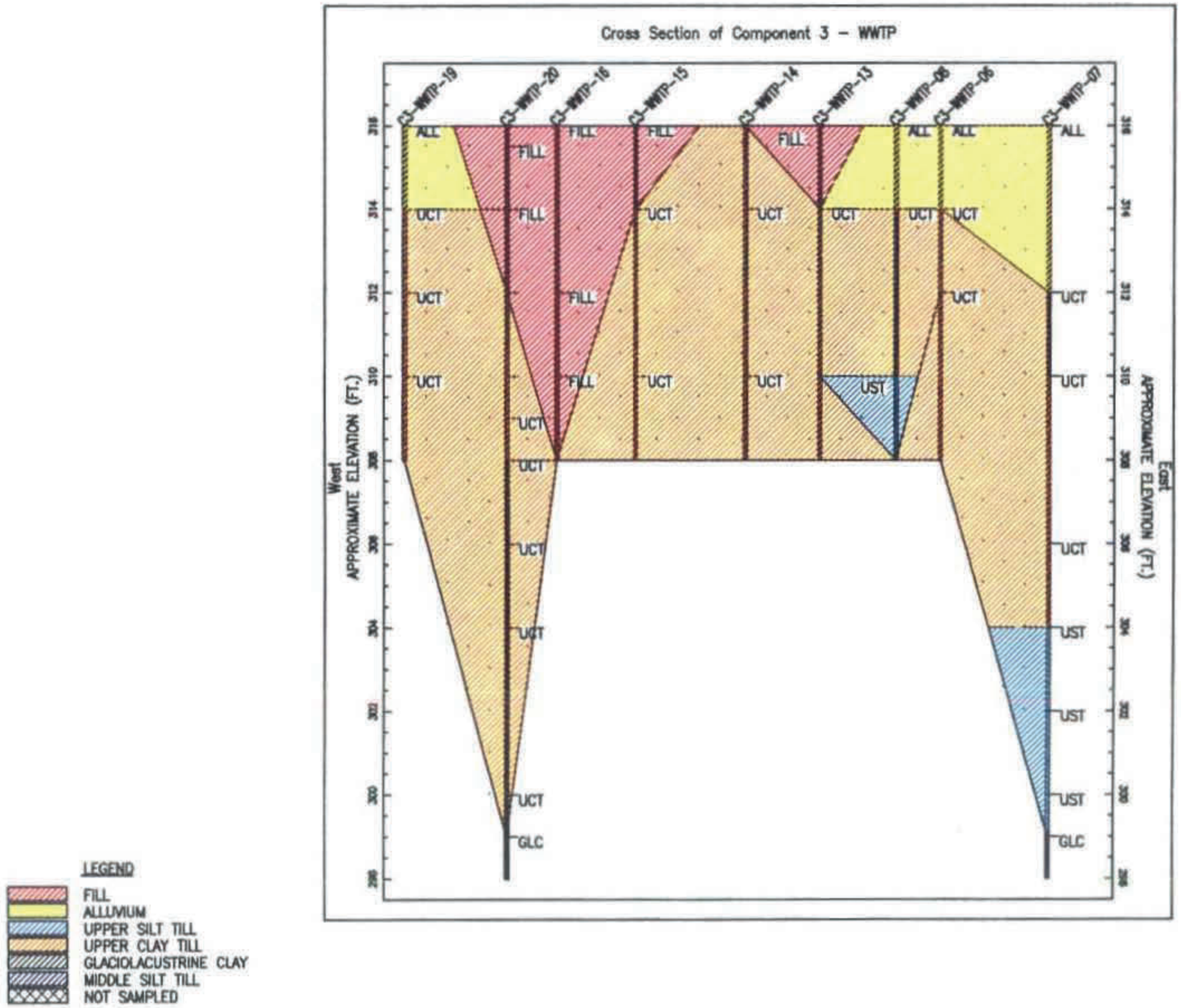

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FIGURE 7.1-2

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high water content, and the proximity of the wet layer to the adjacent brick sewer (approximately 12 to 15 ft bgs) suggested leaking of the sewer into the formation.

The remainder of the borings were installed relatively high in the subsurface, generally 6 to 8 ft bgs. The entire area was likely graded during construction of the pits, tanks, and buildings. A silt till and sand unit (SM/ML) or UCT interbedded with silt and fine sand laminations was frequently encountered at this depth. The silt/sand was frequently moist or saturated. Samples were generally collected at this level, as it was the highest water-bearing zone encountered.

7.1.5 Soil Screening Results

Soil screening results for the WWTP can be found in Table 7.1-1.

VOCs were reported in 17 of the 44 original samples collected at the WWTP. The highest concentration of VOCs, 412 μg/kg of carbon tetrachloride, was reported in location 4 at 0.1 to 0.6 ft bgs. This concentration does not exceed full value of the NY State comparison criteria. However the concentrations exceeds 1/10th the criteria. The other reported VOC concentrations did not exceed 1/10th of the NY State comparison criteria.

TNT and PCB were not reported in field screening samples collected at the WWTP. PAHs were reported in each sample submitted for field screening. The reported total PAH concentrations of surface samples from locations 16 and 20 exceeded the full value of NY State comparison criteria of 10,000 μg/kg for total carcinogenic SVOCs. Reported concentrations for these locations were 19,156 μg/kg and 17,968 μg/kg, respectively. Reported concentrations in additional surface soil sample locations exceeded 1/10th of the criteria. However these elevated PAHs are likely due to deteriorating road surfaces in the vicinity of the WWTP. In addition, subsurface soil samples from locations 9 and 16 exceeded 1/10th the NY State comparison criteria.

7.1.6 Laboratory Analyses and Confirmatory Soil Sample Results

Due to the reported presence of VOCs in sample locations 4 and 18 and the reported presence of elevated PAHs in sample location 16, these locations were revisited. Additional samples were re-collected, screened, and submitted for confirmatory laboratory analysis of DOD marker compounds. In addition to DOD marker compounds, the sample from location 4 was also submitted to the laboratory for analysis of TOC for future use in site risk assessment. Sample depths for those samples selected for laboratory analysis varied slightly from the depth of the original sample.

Soil screening results for confirmatory samples at the WWTP are included in Table 7.1-1. Laboratory analytical sample results for confirmatory samples at the WWTP are included in Table 7.1-2.

Re-screening Results

Although the sample from location 18 was collected from the same interval as the original screening sample, VOCs were not reported in the second sample. Samples from locations 16 and 4 were collected outside of the original screening intervals of 0 to 0.5 ft and 0.1 to 0.6 ft, respectively. PAHs were reported in the second sample from location 16 at a concentration of approximately one-fourth of the original field screening result. VOCs were not reported in the sample from location number 4.

Laboratory Analytical Results

Lithium was reported in each of the 3 samples. The highest concentration of lithium, 19.3 mg/kg, was reported in the sample from location 16. Boron was also reported in each of the three samples at estimated concentrations. Although NY State comparison criteria do not exist for boron and lithium in soil, the reported concentrations did not appear to be elevated in comparison to reported concentrations in other samples collected during this Phase I investigation. VOC, SVOC, PAH, explosives, pesticides/PCBs were not reported in the samples.

7.1.7 Ground-Water Sampling and Results

Due to the presence and concentration of COPC in field screening and the stratigraphy indicating the presence of a water-bearing zone, a 1-in. temporary ground-water sampling point was installed at location 16. The screening interval was between 3 ft and 8 ft bgs in clay with gravel and sand. The well point did not produce enough water for analysis of all DOD marker compounds. Therefore, a ground-water sample was collected and submitted for laboratory analysis of total and dissolved boron and lithium only. A summary of reported analytes is presented in Table 7.1-3.

Table 7.1-1 Component 3, Former LOOW Waste Water Treatment Plant, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-WWTP-SO-01-0.0-0.5	C3-WWTP-SO-01-6.0-6.5	C3-WWTP-SO-02-0.0-0.5	C3-WWTP-SO-02-6.2-6.7	C3-WWTP-SO-03-0.0-0.5	C3-WWTP-SO-03-6.0-6.5	C3-WWTP-SO-04-0.1-0.6	C3-WWTP-SO-04-0.1-0.6 DUP	C3-WWTP-SO-04-1-REP	C3-WWTP-SO-04-6.0-6.5	C3-WWTP-SO-05-0.0-0.5	C3-WWTP-SO-05-6.4-6.9	C3-WWTP-SO-05-6.4-6.9 DUP
E4035	PAH	UG/KG	10000	NYTAGM	2667	527	385	245	569	470	1890	1826	1345	829	752	729	465
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM							33.44	NA					NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM							1.3	NA					NA
GC	BENZENE	UG/KG	60	NYTAGM	0.85	0.86			0.07		0.12	NA					NA
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM							412.12	NA					NA
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM	0.44	0.06		0.02			0.43	NA					NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM							0.54	NA					NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		0.2						NA					NA
GC	TOLUENE	UG/KG	1500	NYTAGM	1.9	0.73		0.63			0.7	NA					NA
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	1.4	0.26		0.45		0.07	1.32	NA			0.06	0.06	NA
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM							0.17	NA					NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 7.1-1 Component 3, Former LOOW Waste Water Treatment Plant, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-WWTP-SO-01-0.0-0.5	C3-WWTP-SO-06-0.0-0.5	C3-WWTP-SO-06-6.0-6.5	C3-WWTP-SO-07-0.2-0.7	C3-WWTP-SO-07-16.0-17.0	C3-WWTP-SO-08-0.1-0.6	C3-WWTP-SO-08-0.1-0.6 DUP	C3-WWTP-SO-08-6.0-6.5	C3-WWTP-SO-09-0.4-0.9	C3-WWTP-SO-09-6.0-6.5	C3-WWTP-SO-10-0.0-0.5	C3-WWTP-SO-10-7.5-8.0	C3-WWTP-SO-11-0.0-0.3
E4035	PAH	UG/KG	10000	NYTAGM	2667	2244	718	387	697	524	584	258	542	2573	1038	461	456
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM					2.27		NA						
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM							NA						
GC	BENZENE	UG/KG	60	NYTAGM	0.85						NA						
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM							NA						
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM	0.44						NA						
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM							NA						
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM							NA						
GC	TOLUENE	UG/KG	1500	NYTAGM	1.9						NA		2.07				
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	1.4			0.06			NA						
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM							NA						

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = tected

Table 7.1-1 Component 3, Former LOOW Waste Water Treatment Plant, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-WWTP-SO-01-0.0-0.5	C3-WWTP-SO-11-6.0-6.5	C3-WWTP-SO-12-0.0-0.5	C3-WWTP-SO-12-6.0-6.5	C3-WWTP-SO-13-0.0-0.5	C3-WWTP-SO-13-6.0-6.5	C3-WWTP-SO-14-0.0-0.5	C3-WWTP-SO-14-6.0-6.5	C3-WWTP-SO-15-0.0-0.5	C3-WWTP-SO-15-6.0-6.5	C3-WWTP-SO-16-0.0-0.5	C3-WWTP-SO-16-1-REP	C3-WWTP-SO-16-6.0-6.5
E4035	PAH	UG/KG	10000	NYTAGM	2667	606	3368	904	969	256	1088	937	2375	327	19156	4775	3373
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM			8.07										
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM			0.56										
GC	BENZENE	UG/KG	60	NYTAGM	0.85		0.13										
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM													
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM	0.44		0.11	0.16									
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM													
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM													
GC	TOLUENE	UG/KG	1500	NYTAGM	1.9		0.82	0.65									
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	1.4												
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM													

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 7.1-1 Component 3, Former LOOW Waste Water Treatment Plant, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-WWTP-SO-01-0.0-0.5	C3-WWTP-SO-17-0.0-0.5	C3-WWTP-SO-17-6.0-6.5	C3-WWTP-SO-18-0.1-0.6	C3-WWTP-SO-18-4-REP	C3-WWTP-SO-18-4.0-4.5	C3-WWTP-SO-19-0.0-0.5	C3-WWTP-SO-19-6.0-6.5	C3-WWTP-SO-20-0.0-0.5	C3-WWTP-SO-20-15.0-15.5	C3-WWTP-SO-20-15.0-15.5-DUP	C3-WWTP-SO-BP1-0.0-0.5	C3-WWTP-SO-BP1-6.1-6.6
E4035	PAH	UG/KG	10000	NYTAGM	2667	1389	368	398	254	351	869	774	17968	616	NA	1198	505
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM				2		2.78	4.82						
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM													
GC	BENZENE	UG/KG	60	NYTAGM	0.85					0.08							
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM													
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM	0.44						0.01	0.02					
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM													
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM													
GC	TOLUENE	UG/KG	1500	NYTAGM	1.9			0.41					2.44				
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	1.4												
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM													

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 7.1-1 Component 3, Former LOOW Waste Water Treatment Plant, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-WWTP-SO-01-0.0-0.5	C3-WWTP-SO-BP2-0.5-1.0	C3-WWTP-SO-BP2-8.3-8.8
E4035	PAH	UG/KG	10000	NYTAGM	2667	685	169
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM			
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM			
GC	BENZENE	UG/KG	60	NYTAGM	0.85		
GC	CARBON TETRACHLORIDE	UG/KG	600	NYTAGM			
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM	0.44		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM			
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM			
GC	TOLUENE	UG/KG	1500	NYTAGM	1.9		
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	1.4		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 7.1-2 Component 3, Former LOOW Waste Water Treatment Plant, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-WWTP-SO-04-1-REP	C3-WWTP-SO-16-1-REP	C3-WWTP-SO-18-4-REP
E415.1	TOTAL ORGANIC CARBON	MG/KG			9660	NA	NA
SW6010	BORON	MG/KG			3.1 B	6.5 B	3.2 B
SW6010	LITHIUM	MG/KG			3.6	19.3	17.6

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 7.1-3 Component 3, Former LOOW Waste Water Treatment Plant, Summary of Detected Analytes in Ground Water *(Laboratory Analytical Results)*

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3WWTPGW16
SW6010	BORON	D	UG/L	1000	NYSTANDARD	153
SW6010	BORON	T	UG/L	1000	NYSTANDARD	318
SW6010	LITHIUM	D	UG/L			4.9 B
SW6010	LITHIUM	T	UG/L			456

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = *not analyzed*
blank = not detected

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Both total and dissolved fractions of boron and lithium were reported in the ground-water sample. The total and dissolved boron concentrations exceeded the 1/10th of the NY State comparison criteria.

7.2 FORMER LOOW WWTP VICINITY SHOPS

7.2.1 Site Background

The Vicinity Shops (VS) were associated with the former LOOW and were located west of the former LOOW WWTP. The former VS buildings west of the WWTP, located on Town of Lewiston property (Component 3), included a paint shop, fabrication shop, tool house, and electrical shop (Figure 7.2-1). Two railroad loading platforms were located southwest of the WWTP, along the current property boundary that separates Component 3 (Town of Lewiston) from Component 5 (NFSS). The southern extension of the vicinity shops grid (located on NFSS property, from row F south to row A) is discussed in Chapter 9.

7.2.2 Field Reconnaissance and Surface Features

During the Phase I RI, a site reconnaissance was performed prior to establishing a sampling grid within the area of the WWTP vicinity shops. Remnants of the wooden structures of the former LOOW Paint Shop, located west of the WWTP, were observed during the site reconnaissance (see Photograph 7.2-1). Also, remnant railroad ties from the former LOOW railroad were found in the area of the unloading platforms, southwest of the WWTP, during the investigation.

Photograph 7.2-1. Photograph of remnants of the former LOOW Paint Shop. Location of sample C3-VS-SO-BP1.

Surface features of the vicinity shops grid include the remains of an unnamed street, trending north-south on the west edge of the grid. This street was built during construction of the LOOW WWTP and vicinity shops. In addition remnants of the former railroad bed were visible. The foundations of the former shops were not observed, but demolition debris was present along the northern end of the sampling grid (rows P through R of the sampling grid) corresponding to the location of the former paint shop. The former railroad bed was excavated; remaining evidence of the tracks include a 10-ft wide by 1-ft deep trench, with scattered cobbles. A fence borders the northern, western, and southern portion of the area, delineating the current property boundary for the Town of Lewiston.

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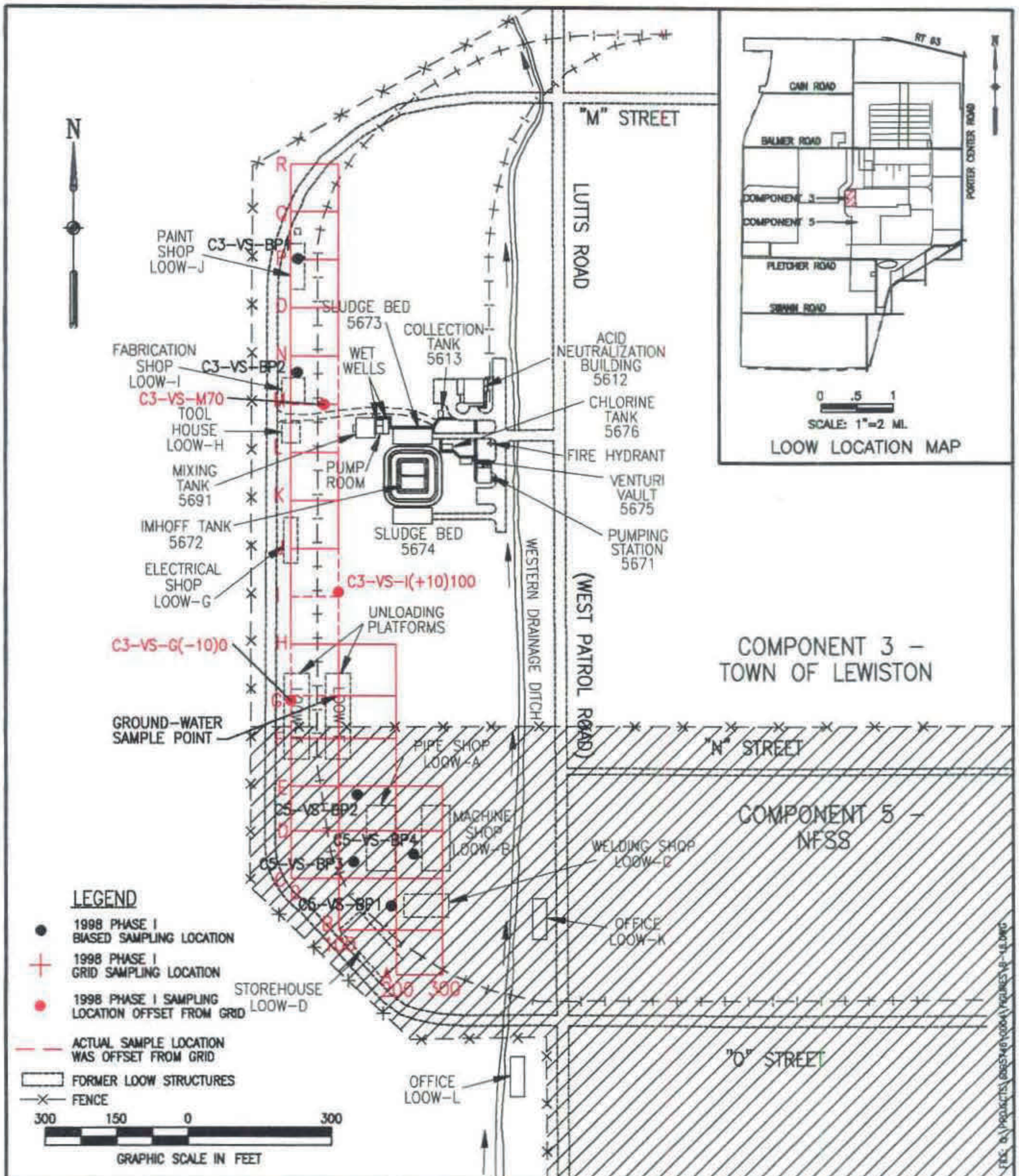

EA ENGINEERING, SCIENCE, AND TECHNOLOGY			BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK			COMPONENT 3 (TOWN OF LEWISTON) WWTP VICINITY SHOPS SAMPLING GRID LOCATIONS	
PROJECT MGR HGP	DESIGNED BY SMS	DRAWN BY FDV	CHECKED BY BCR	SCALE AS SHOWN	DATE JULY 1999	PROJECT NO 60957.46	FIGURE 7.2-1

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7.2.3 Soil Sampling Program

During the Phase I RI, field activities at the former LOOW WWTP Vicinity Shops included collection of surface soil, subsurface soil, and ground-water samples. The ground-water sampling program is discussed in Section 7.2.7.

A sampling grid, with approximate 100-ft intervals, was established across the site (Figure 7.2-1). Grid points were given alphanumeric designations, with A0 being the southwestern origin of the grid. However, since this sampling grid spans two separate components, for the purposes of this section, the discussion of sample results begins with G0. The 0 line was sited along the east edge of the road, and the 100-ft line was sited parallel to, but east of the railroad bed in the wooded area. The M row was located directly on the current clay/asphalt access road. South of row G, the grid continues on NFSS property (Component 5). Chapter 9 includes a discussion of the southern extension of the grid. Refusal occurred in Q0 at approximately 8 ft bgs. Therefore, a subsurface sample was not collected from this location.

In addition, two biased sampling locations were established within the grid. The first location, C3-VS-SO-BP1, was located in the center of what is believed to be the former LOOW Paint Shop. C3-VS-SO-BP2 was located adjacent to the northern edge of what is believed to be the former LOOW Fabrication Shop.

Direct push technology was used to perform sampling at each grid location. Surface soil samples, ranging in depth from 0 to 2.6 ft bgs (deeper due to proximity of the road), and subsurface soil samples, ranging in depth from 4.1 to 14.5 ft bgs, were collected from each location. Soil samples were field screened for VOCs, PAHs, PCB, and TNT.

Soil field screening results were reviewed to designate locations for collection of laboratory confirmatory samples. Those screening locations exhibiting the highest level of elevated concentrations of COPC were revisited. Samples were re-collected, re-screened, and submitted for confirmatory laboratory analysis as discussed in Sections 7.2.5 and 7.2.6.

7.2.4 Site Stratigraphy

7.2.4.1 Surface Soil

Typical surface samples (0 to 2 ft bgs) consisted of a mixture of gravel, topsoil, upper clay till, and fine sand or silt. Due to previous site use, recent road improvements, and proximity of the roads, railroad tracks, and WWTP, it is assumed that the surface layers were heavily graded. The ground surface in the northern extension of the VS grid is moist and swampy, and it may be inferred that fill material was brought in as foundation material.

7.2.4.2 Subsurface Stratigraphy

The subsurface in the area of the vicinity shops is generally characterized by the thickest UCT layer encountered at LOOW, ranging from the near the surface to 18 ft bgs at location 20 (adjacent to row M of the VS grid). The UCT clay was moist below approximately 9 ft bgs, but became increasingly softer, plastic, and gray-colored toward the bottom of the boring. North of the M row, very little vertical exploration was performed, due to difficulty collecting samples through the fill material; nearly all samples in this area were collected between 6 to 8 ft bgs.

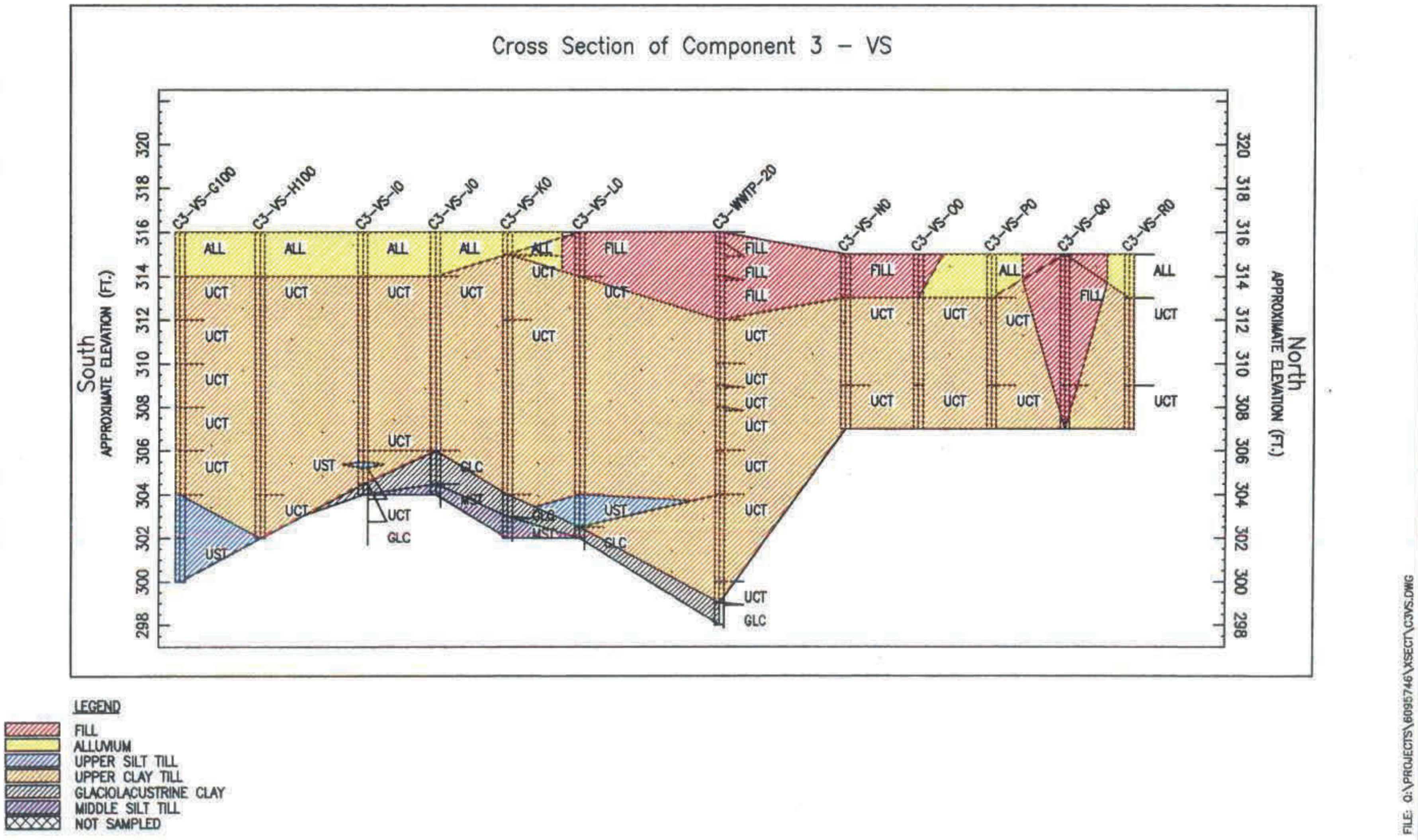
South of the M row, increasing subsurface variability and increasing moisture were encountered. A localized "high" in the GLC was observed at J0 (less than 10 ft bgs) (Figure 7.2-2). Beneath the thin GLC layer (1 ft to 2 ft), a wet, grayish red silt [presumably the middle silt till (MST)] was observed at J0 and K0, at 11 ft and 13 ft bgs, respectively; these were the only observations of the MST layer made during the RI. This is consistent with previous observations that the GLC was split in two by the MST in the western and northwestern portions of the facility.

South of the GLC "high" at the J row, a thin lens of silt/sand (SM) was observed in I0 between two UCT layers (approximately 11 ft bgs). The SM layer thickens and deepens to the south and southeast (G0 and G100) to at least 4 ft. The water-bearing SM/ML layer continues on the southern extension of the grid (Section 9.4).

7.2.5 Soil Screening Results

Soil screening results for the WWTP Vicinity Shops are included in Table 7.2-1.

VOCs were reported in 10 of the original 55 samples collected within the northern portion (rows G through R) of the sampling grid. The highest concentration of VOCs, 28.44 µg/kg of TCE,



Cross Section of Component 3 - VS
South
APPROXIMATE ELEVATION (FT.)
North
APPROXIMATE ELEVATION (FT.)
C3-VS-G100
C3-VS-H100
C3-VS-I0
C3-VS-J0
C3-VS-K0
C3-VS-L0
C3-WWTP-20
C3-VS-N0
C3-VS-O0
C3-VS-P0
C3-VS-Q0
C3-VS-R0
LEGEND
FILL
ALLUVIUM
UPPER SILT TILL
UPPER CLAY TILL
GLACIOLACUSTRINE CLAY
MIDDLE SILT TILL
NOT SAMPLED
FILE: Q:\PROJECTS\6095746\XSECT\C3VS.DWG

FIGURE 7.2-2

was reported in J0 at 10 ft to 10.5 ft bgs. The reported VOC concentrations did not exceed 1/10th of the NY State comparison criteria.

PAHs were reported in all soil samples submitted for screening. PAH concentrations exceeded the full value of the NY State comparison criteria in the semi-subsurface soil sample collected from G(-10)0 and the surface soil sample collected from M0. However, the PAH concentration reported in the sample collected from M0, as well as those concentrations exceeding 1/10th of the criteria in the surface soils collected from locations R0 and R100, may have been the result of impact from deteriorating road material. In addition, PAH concentrations exceeded 1/10th the NY State comparison criteria in the subsurface soil samples collected from H200 and L0.

TNT was reported in Q0 at 0 to 0.5 ft with a concentration of 110 μg/kg. Note that this concentration is estimated, since it is below the method detection limit. The reported TNT concentration did not exceed 1/10th of the NY State comparison criteria. PCB were not reported in the field-screening samples.

7.2.6 Laboratory Analyses and Confirmatory Soil Sample Results

Due to the reported presence of VOCs in sample locations H0 and P100, and the reported presence of TNT in Q0, these locations were revisited. Additional samples were re-collected, screened, and submitted for confirmatory laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives. Sample depths for those samples selected for laboratory analysis varied slightly from the depth of the original sample.

Soil screening results for confirmatory samples at the WWTP Vicinity Shops are included in Table 7.2-1. Laboratory analytical sample results for confirmatory samples at the WWTP Vicinity Shops are included in Table 7.2-2.

<u>Re-screening Results</u>

Although the sample of H0 at 6 ft for laboratory analysis was collected from the same interval as the original screening sample, VOCs were not reported in this second sample. VOCs were not reported in the recollected sample from location P100 at 1 ft. TNT was not reported in the recollected sample from location Q0; however, PAH were reported exceeding 1/10th NY State comparison criteria.

Laboratory Analytical Results

Antimony and iron exceeded the full value of the NY State comparison criteria in the subsurface soil sample collected from H0. Several other metals were reported in the sample collected at location H0 at concentrations exceeding $1/10^{th}$ the criteria. Iron exceeded the full value of the NY State comparison criteria and several other metals exceeded $1/10^{th}$ the criteria in the surface soil samples collected from locations P100 and Q0. A summary of reported analytes is presented in Table 7.2-2.

SVOCs, including several PAHs, were reported in all three samples at concentrations below $1/10^{th}$ of the NY State comparison criteria. PCB were reported in the sample collected from location Q0 in concentrations that did not exceed $1/10^{th}$ of the comparison criteria. Pesticides were reported in samples collected from H0 and Q0 in concentrations that did not exceed $1/10^{th}$ of the NY State comparison criteria.

VOCs, explosives, and cyanide were not reported in the laboratory confirmatory soil samples collected from the vicinity shops on Component 3.

7.2.7 Ground-Water Sampling and Results

Due to the stratigraphy indicating the presence of a water-bearing zone, a 2-in. temporary ground-water sampling point was installed at location G100. The screening interval was between 7 to 17 ft bgs and included a lens of saturated silt. A ground-water sample was collected and submitted for laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives.

Reported concentrations of antimony, boron, iron, manganese, magnesium, and sodium exceeded the NY State comparison criteria. Concentrations of several other metals exceeded $1/10^{th}$ the criteria. The pesticide α-BHC, for which the screening criteria is zero, was reported at a concentration of 0.0082 μg/L. 1,3,5-Trinitrobenzene was reported in this ground-water sample in concentrations that did not exceed $1/10^{th}$ of the NY State comparison criteria. VOCs, SVOCs, PAHs, pesticides, PCB and cyanide were not reported in the ground-water sample collected from Component 3 Vicinity Shops. Results are summarized in Table 7.2-3.

Table 7.2-1 Component 3, Former LOOW WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-VS-SO-BP1-0.0-2.0	C3-VS-SO-BP1-8.5-9.0	C3-VS-SO-BP1-8.5-9.0-DUP	C3-VS-SO-BP2-0.0-0.5	C3-VS-SO-BP2-13.5-14.0	C3-VS-SO-G(-10)-11.5-12.0	C3-VS-SO-G(-10)-2.1-2.6	C3-VS-SO-G100-0.0-0.5	C3-VS-SO-G100-14.0-14.5	C3-VS-SO-G200-0.0-0.5	C3-VS-SO-G200-11.5-12.0	C3-VS-SO-G200-11.5-12.0-DUP	C3-VS-SO-H0-0.5-1.0	C3-VS-SO-H0-6-REP
E4035	PAH	UG/KG	10000	NYTAGM	243	246	NA	273	549	324	10180	579	572	569	212	268	645	584
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE			NA											
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM												NA		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM												NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM												NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM												NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM												NA		
GC	O-XYLENE	UG/KG	1200	NYTAGM												NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM												NA		
GC	TOLUENE	UG/KG	1500	NYTAGM												NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM												NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 7.2-1 Component 3, Former LOOW WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-VS-SO-BP1-0.0-2.0	C3-VS-SO-H0-6.2-6.6	C3-VS-SO-H100-0.0-0.5	C3-VS-SO-H100-13.5-14.0	C3-VS-SO-H200-0.0-0.5	C3-VS-SO-H200-13.5-14.0	C3-VS-SO-I(+10)100-0.0-0.5	C3-VS-SO-I(+10)100-6.5-7.0	C3-VS-SO-I0-0.0-0.5	C3-VS-SO-I0-0.0-0.5-DUP	C3-VS-SO-I0-10.3-10.8	C3-VS-SO-J0-0.0-0.5	C3-VS-SO-J0-10.0-10.5	C3-VS-SO-J100-0.0-0.5
E4035	PAH	UG/KG	10000	NYTAGM	243	289	319	631	327	1215	228	527	493	317	507	411	667	482
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM		5.5								NA				
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		0.29				0.46				NA				
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		0.1								NA				
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		1.49								NA				
GC	M & P-XYLENES	UG/KG	1200	NYTAGM										NA				
GC	O-XYLENE	UG/KG	1200	NYTAGM										NA				
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		0.22								NA				
GC	TOLUENE	UG/KG	1500	NYTAGM										NA				
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		0.32								NA			28.44	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = n[illegible]cted

Table 7.2-1 Component 3, Former LOOW WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-VS-SO-BP1-0.0-2.0	C3-VS-SO-J100-7.0-7.5	C3-VS-SO-K0-0.0-0.5	C3-VS-SO-K0-12.8-13.3	C3-VS-SO-K0-12.8-13.3-DUP	C3-VS-SO-K100-0.0-0.5	C3-VS-SO-K100-12.7-13.2	C3-VS-SO-L0-0.5-1.0	C3-VS-SO-L0-12.0-12.5	C3-VS-SO-L100-0.0-0.5	C3-VS-SO-L100-4.1-4.6	C3-VS-SO-M0-1.4-1.9	C3-VS-SO-M0-6.7-7.2	C3-VS-SO-M70-0.5-1.0
E4035	PAH	UG/KG	10000	NYTAGM	243	591	248	408	411	935	344	317	1091	738	323	22849	436	328
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM					NA									
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA									
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA									
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM					NA					3.36				
GC	M & P-XYLENES	UG/KG	1200	NYTAGM					NA									
GC	O-XYLENE	UG/KG	1200	NYTAGM					NA									
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM					NA									
GC	TOLUENE	UG/KG	1500	NYTAGM					NA									
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM					NA									

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 7.2-1 Component 3, Former LOOW WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-VS-SO-BP1-0.0-2.0	C3-VS-SO-M70-5.3-5.8	C3-VS-SO-N0-0.5-1.0	C3-VS-SO-N0-6.0-6.5	C3-VS-SO-N100-0.0-0.5	C3-VS-SO-N100-0.0-0.5-DUP	C3-VS-SO-N100-9.5-10.0	C3-VS-SO-O0-0.3-0.8	C3-VS-SO-O0-6.5-7.0	C3-VS-SO-O100-0.0-0.5	C3-VS-SO-O100-9.5-10.0	C3-VS-SO-P0-0.1-0.6	C3-VS-SO-P0-6.4-6.9	C3-VS-SO-P0-6.4-6.9-DUP
E4035	PAH	UG/KG	10000	NYTAGM	243	450	427	186	635	673	272	531	282	374	377	609	399	NA
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE														
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM						NA								NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM						NA								NA
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM						NA								NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM						NA								NA
GC	M & P-XYLENES	UG/KG	1200	NYTAGM						NA								NA
GC	O-XYLENE	UG/KG	1200	NYTAGM						NA								NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM						NA								NA
GC	TOLUENE	UG/KG	1500	NYTAGM						NA								NA
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM						NA								NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 7.2-1 Component 3, Former LOOW WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-VS-SO-BP1-0.0-2.0	C3-VS-SO-P100-0.0-0.3	C3-VS-SO-P100-1-REP	C3-VS-SO-P100-9.5-10.0	C3-VS-SO-P100-9.5-10.0 DUP	C3-VS-SO-Q0-0.0-0.5	C3-VS-SO-Q0-1-REP	C3-VS-SO-Q100-0.0-0.5	C3-VS-SO-Q100-9.5-10.0	C3-VS-SO-R0-0.3-0.8	C3-VS-SO-R0-7.5-8.0	C3-VS-SO-R100-0.0-0.5	C3-VS-SO-R100-9.5-10.0
E4035	PAH	UG/KG	10000	NYTAGM	243	447	523	445	529	579	1086	252	420	2938	596	1694	358
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE						110							
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM					NA								
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM					NA							0.06	
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM					NA								
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				1.22	NA								
GC	M & P-XYLENES	UG/KG	1200	NYTAGM					NA							9.79	
GC	O-XYLENE	UG/KG	1200	NYTAGM		10.47			NA								
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		0.28			NA					0.03		0.42	0.25
GC	TOLUENE	UG/KG	1500	NYTAGM				1	NA			2.72				0.28	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM					NA								

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 7.2-2 Component 3, Former LOOW WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-VS-SO-H0-6-REP	C3-VS-SO-P100-1-REP	C3-VS-SO-Q0-1-REP
E160.3	PERCENT MOISTURE	%			11.4	18.3	7.3
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	12700	10200	7330
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.68 N	0.39 BN	0.38 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	3.7	2.3	3.1
SW6010	BARIUM	MG/KG	300	NYTAGM	112	88.1	98.8
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.54	0.45 B	0.25 B
SW6010	BORON	MG/KG			8.1 B	5.1 B	5.6 B
SW6010	CALCIUM	MG/KG			51200 *	32700 *	87600 *
SW6010	CHROMIUM	MG/KG	50	NYTAGM	17.6	14.6	9.6
SW6010	COBALT	MG/KG	30	NYTAGM	12.5	7.4	6
SW6010	COPPER	MG/KG	50	NYTAGM-BG	28.8	21.1	40.6
SW6010	IRON	MG/KG	2000	NYTAGM	28300	21900	20800
SW6010	LEAD	MG/KG	400	NYTAGM	6.4	6.3	26.6
SW6010	LITHIUM	MG/KG			29.3	20.9	15.5
SW6010	MAGNESIUM	MG/KG			11000	6810	4940
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	708	456	1220
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	24	17.1	13.2
SW6010	POTASSIUM	MG/KG			1800	1280	1010
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG			0.44 B
SW6010	SODIUM	MG/KG			311	173	165
SW6010	VANADIUM	MG/KG	150	NYTAGM	24.2	20.5	13.2
SW6010	ZINC	MG/KG	76	NYTAGM-BG	50.8	42.3	56.1
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG	0.12 B	0.11 B	
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM		0.73 P	
SW8081	ALDRIN	UG/KG	41	NYTAGM		0.19 P	
SW8081	BETA-BHC	UG/KG	200	NYTAGM	0.32 P		
SW8081	ENDRIN ALDEHYDE	UG/KG					1.8 P

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 7.2-2 Component 3, Former LOOW WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-VS-SO-H0-6-REP	C3-VS-SO-P100-1-REP	C3-VS-SO-Q0-1-REP
SW8081	GAMMA-BHC	UG/KG	60	NYTAGM			0.13 P
SW8082	AROCLOR 1260	UG/KG	1000	NYTAGM			22
SW8270C	BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	50000	NYTAGM	170		
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM			1.4
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM			3.1
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	3	2.1	4.3
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	2.7	2.4	4.5
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	0.96	0.59	1.6
SW8310	CHRYSENE	UG/KG	400	NYTAGM	0.99	1.1	2.3
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM			2.2
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM	1.9		2.5
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM		0.96	1.8
SW8310	PYRENE	UG/KG	50000	NYTAGM		0.95	2.9

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 7.2-3 Component 3, Former LOOW WWTP Vicinity Shops, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-VS-GW-G100
SW6010	ALUMINUM	D	UG/L			251
SW6010	ALUMINUM	T	UG/L			440
SW6010	ANTIMONY	D	UG/L	3	NYGUIDANCE	5.3 B
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	4.4 B
SW6010	ARSENIC	D	UG/L	25	NYSTANDARD	6.3 B
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD	5.4 B
SW6010	BARIUM	D	UG/L	1000	NYSTANDARD	37.4 B
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	48.1 B
SW6010	BORON	D	UG/L	1000	NYSTANDARD	229
SW6010	BORON	T	UG/L	1000	NYSTANDARD	1420
SW6010	CALCIUM	D	UG/L			285000
SW6010	CALCIUM	T	UG/L			285000 E*
SW6010	IRON	T	UG/L	300	NYSTANDARD	718 E*
SW6010	LEAD	T	UG/L	25	NYSTANDARD	1.2 B
SW6010	LITHIUM	D	UG/L			129
SW6010	LITHIUM	T	UG/L			126
SW6010	MAGNESIUM	D	UG/L	35000	NYSTANDARD	524000
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	534000 *
SW6010	MANGANESE	D	UG/L	300	NYSTANDARD	1340
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	956 *
SW6010	POTASSIUM	D	UG/L			6830
SW6010	POTASSIUM	T	UG/L			7570 *
SW6010	SELENIUM	D	UG/L	10	NYSTANDARD	8
SW6010	SELENIUM	T	UG/L	10	NYSTANDARD	3.8 B
SW6010	SODIUM	D	UG/L	20000	NYSTANDARD	249000
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	230000
SW8081	ALPHA-BHC	N	UG/L	0	NYSTANDARD	0.0082

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 7.2-3 Component 3, Former LOOW WWTP Vicinity Shops, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C3-VS-GW-G100
SW8330	1,3,5-TRINITROBENZENE	N	UG/L	5	NYSTANDARD	0.08

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

7.3 CONCLUSIONS AND RECOMMENDATIONS

Because of the potential impact from COPC from non-DOD use, the WWTP is not eligible for further evaluation under this DERP-FUDS HTRW project. However, there is no evidence that the WWTP vicinity shops area have been impacted by potential COPC from non-DOD site use. Therefore, the elevated PAHs reported in the subsurface soil collected from locations H200 and L0 within the WWTP vicinity shops area is recommended for further investigation. In addition, although it is likely that the reported concentrations of total PAHs in the surface soil samples collected from G(-10)0 and M0 are due to deteriorating road surfaces, because the reported concentrations exceeded the NY State comparison criteria, these locations are recommended for further evaluation.

Also, it is recommended that the extent of impact from elevated boron concentrations in ground water in the vicinity of location G100 be further evaluated.

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8. COMPONENT 4 (TOWN OF PORTER) DATA RESULTS AND EVALUATION

The Town of Porter owns approximately 3.4 acres of the former LOOW, located north of Balmer Road in the eastern portion of the former LOOW. The property, transferred to the Town of Porter in 1985, contains a water tower that was constructed by the Air Force during operation of AFP-38.

Field reconnaissance was performed during the investigation. Other than the presence of deteriorated paint which may be lead-based, and possible asbestos containing materials (ACM), there was no substantiated reason to suspect that DOD activities created an impact to the environment. In addition, the Town of Porter beneficially uses the water tower, making it ineligible for investigation under this DERP-FUDS HTRW project. Therefore, no further investigation of the Town of Porter property is proposed during this RI.

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9. COMPONENT 5 (NFSS) DATA RESULTS AND EVALUATION

9.1 SITE BACKGROUND

Three areas related to the former LOOW production facility currently located on the Niagara Falls Storage Site (NFSS) property were included in this Phase I RI. These areas include the acid concentration area, the shop area south of O Street, and the southern extension of the WWTP vicinity shops area. The acid concentration area and shop area south of O Street are adjacent to each other and were investigated concurrently using the same grid. The Vicinity Shops area is located approximately 1,000 ft west of the acid concentration area.

CWM (Component 1) and Town of Lewiston (Component 3) properties border the northern portion of NFSS. An active landfill cell owned by Modern (Component 6) is located immediately to the east and southeast of the grid.

Due to the use of the site by the Manhattan District and subsequently by the AEC/DOE for storage of radioactive material, the NFSS was incorporated into the Formerly Used Sites Remedial Action Program (FUSRAP) site. Therefore, in addition to the former LOOW activities that were investigated under the DERP-FUDS program during the Phase I Remedial Investigation, there are also ongoing investigations specific to the use of the site by the AEC/DOE that are part of the FUSRAP investigation for the NFSS. The active portion of NFSS, an Interim Waste Containment (IWC) structure, is located west and southwest of the sampling areas investigated during the DERP-FUDS HTRW Phase I RI.

9.2 FIELD RECONNAISSANCE AND SURFACE FEATURES

The former LOOW acid concentration area, located east of Campbell Street and north of O street, corresponds to rows E through G of the grid. Structures present in the acid concentration area include numerous tank cradles, building foundations, concrete sub-floors, sumps, manholes, and former LOOW roads. Subsurface structures include possible building foundations and storm water, acid waste, and sanitary sewer lines (EA 1998a).

Photograph 9.2-1 Photograph showing tank cradles from the former LOOW Acid Concentration Area.

The shop area is located between Campbell Street and Castle Garden Road, south of O Street. This area corresponds to rows A through E of the grid. The largest structure present within the area is the foundation of a former LOOW combined shops building, located along the D row (Building foundation 717 on Figure 9.3-1). Several other foundations or concrete sub-floors were observed at the site, particularly in the southern part of the grid. Mounded soil was observed in the vicinity of former LOOW building 724-1 (the former LOOW gas station). Personnel working within the NFSS indicated that a tank removal was performed in this area. However, documentation of the removal was not located. The identities of the former buildings associated with these foundations are presented in the Final History Report (EA 1998a).

In general, the acid concentration/shop area is flat, with no noticeable grade. However, due to the size of the grid (1,200 ft north to south), a 5-ft difference in elevation from north to south is expected, based on the average slope of the Lake Ontario Plain of 20 ft per mile.

A small, elongated pond is located along the eastern end of the E row (O Street). Also, the southwestern portion of the grid is very moist with various wetland plants (i.e., cattails, etc.). Several manmade drainages bisect the area including K ditch, draining to the west and located just south of O Street.

Overgrown vegetation and former LOOW roads characterize the southern portion of the WWTP vicinity shops. The foundations of some of the former LOOW shops were visible. The northerly flowing Western Drainage Ditch lies to the east of the WWTP vicinity shops.

9.3 SOIL SAMPLING PROGRAM

9.3.1 Acid Concentration Area & Shop Area South of O Street

During the Phase I RI, field activities at the former acid concentration area and shop area south of O Street included collection of surface-soil, subsurface-soil, ground-water, sludge, wastewater, surface water, and sediment samples. In addition, excavations were performed to access pipes associated with sump-like structures found within the acid concentration area. The sludge and wastewater sampling program is discussed in Chapter 11. The surface water and sediment sampling results are discussed in Chapter 13. The ground-water sampling program is discussed in Section 9.7. The soil sampling results are discussed herein.

Sump Excavation, Soil Sampling Program, and Results

During reconnaissance of the acid concentration area, several sump-like structures were found. To access potential underground lines associated with the sumps, the area around two of the sumps was excavated. The sumps drain vertically into an underground line that turns 90° and trends laterally toward the tank cradles. Sludge samples were collected from the sumps and from the underground lines associated with the sumps (C7-NFSS-SL- SUMP1 and SUMP2 and PIPE1 and PIPE2). The results for these samples are discussed in Chapter 11.

In addition to the sludge samples, soil samples were collected from beneath each of the exposed pipes to evaluate potential impact to the subsurface. Two samples were collected, one from beneath PIPE1 (C7-NFSS-SO-PIPE1) and one from beneath PIPE2 (C7-NFSS-SO-PIPE2). The samples were field screened for VOCs, PAH, PCB, and TNT. PAHs were reported in the soil sample from beneath PIPE1, in concentrations that exceeded 1/10th of the NY State comparison criteria. VOCs, PCB, and TNT were not reported.

PAHs were reported in the soil sample collected from beneath PIPE2 in concentrations that exceeded the NY State comparison criteria. PCB were reported in concentrations exceeding 1/10th of the NY State comparison criteria. TNT was also reported in the soil sample collected from beneath PIPE2, in concentrations that did not exceed 1/10th of the comparison criteria. VOCs were not reported in soil sample collected from beneath PIPE2.

These samples were also submitted for laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives. Copper, iron, zinc, and mercury were reported in concentrations exceeding the NY State comparison criteria in the sample collected from beneath PIPE1. Additional metals exceeded 1/10th of the comparison criteria. Dieldrin also exceeded the NY State comparison criteria in the sample collected from beneath PIPE1. Additional pesticides were reported in concentrations that did not exceed 1/10th of the criteria. Acetone was reported in concentrations exceeding the comparison criteria. However, acetone was also reported in the associated blank. PAHs were reported in concentrations that did not exceed 1/10th of the NY State comparison criteria. SVOCs, PCB, explosives, and cyanide were not reported in the soil sample collected from beneath PIPE1.

In the sample collected from beneath PIPE2, copper and iron exceeded the NY State comparison criteria. Additional metals exceeded 1/10th of the comparison criteria. Dieldrin was reported in concentrations exceeding the NY State comparison criteria. Alpha-chlordane exceeded 1/10th of the comparison criteria. Benz[a]anthracene was reported in concentrations exceeding 1/10th of the NY State comparison criteria. Additional PAHs were reported in concentrations that did not exceed 1/10th of the criteria. VOCs, SVOCs, PCB, cyanide, and explosives were not reported in the sample collected from beneath PIPE2.

Direct Push Sampling Program

A sampling grid, with approximate 200-ft intervals between sampling points, was established across the shops area south of O Street and the acid concentration area (Figure 9.3-1). Grid points were given alphanumeric designations, with A0 being the southwestern origin of the grid. The grid extended 1,200 ft to the north (to row G) and 1,600 ft to the east (at its widest point), for a total of 51 sampling locations. Due to the proximity of the property boundary on the east side, the1000-ft row was shifted to the west to 950 ft for rows A-D.

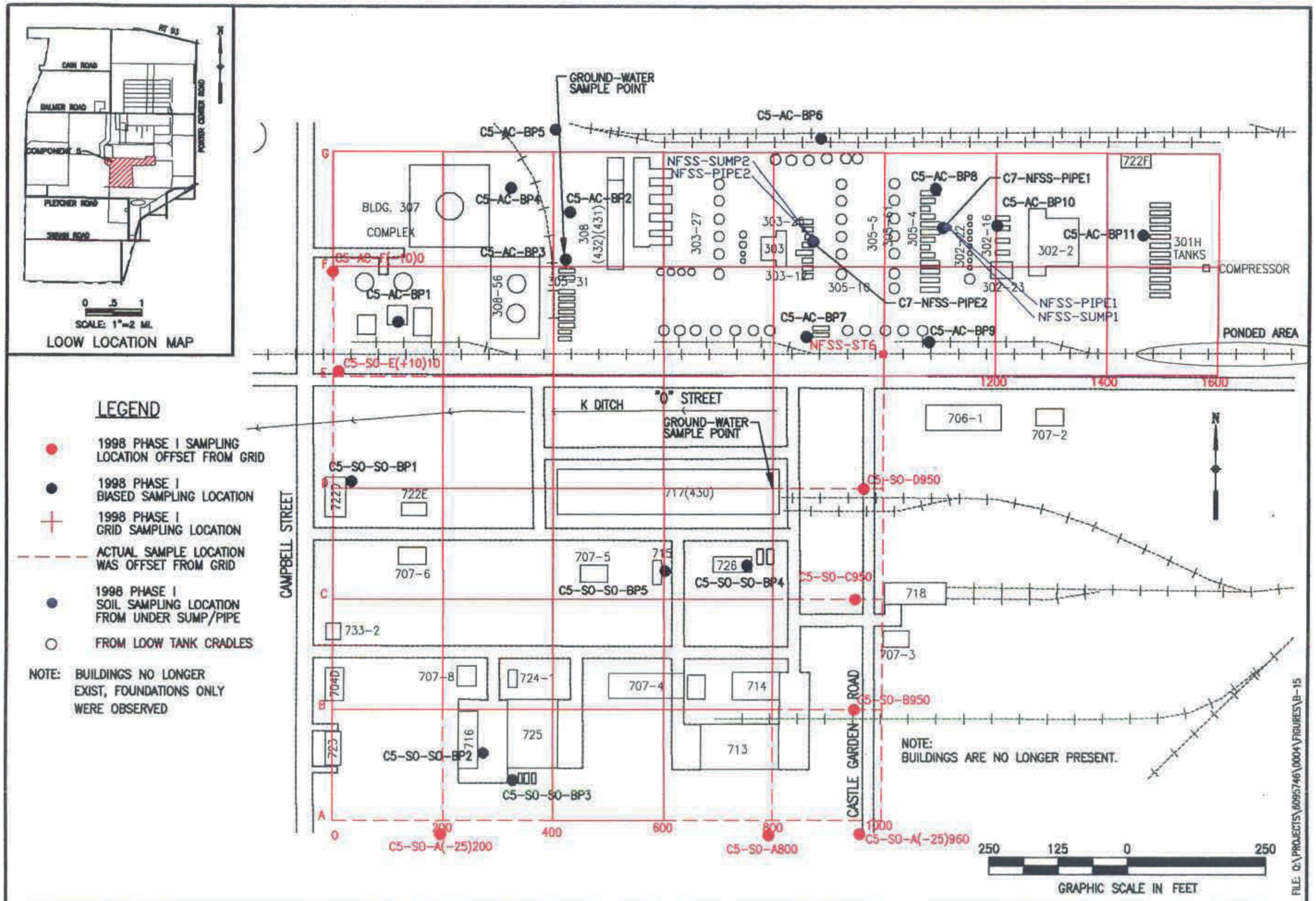
In addition, 11 biased sampling locations were established within the acid concentration area portion of the grid and 5 biased sampling locations were established within the shops area portion of the grid. Table 9.3-1 details the biased point sample locations and rationale behind their placement.

Direct push technology was used to perform sampling at each grid location. Surface soil samples, ranging in depth from 0 to 1 ft bgs, and subsurface soil samples, ranging in depth from 4.3 to 14.5 ft bgs, were collected from each location. Three samples were collected from location D600, a surface, intermediate, and deep sample. Soil samples were field screened for VOCs, PAHs, PCB, and TNT.

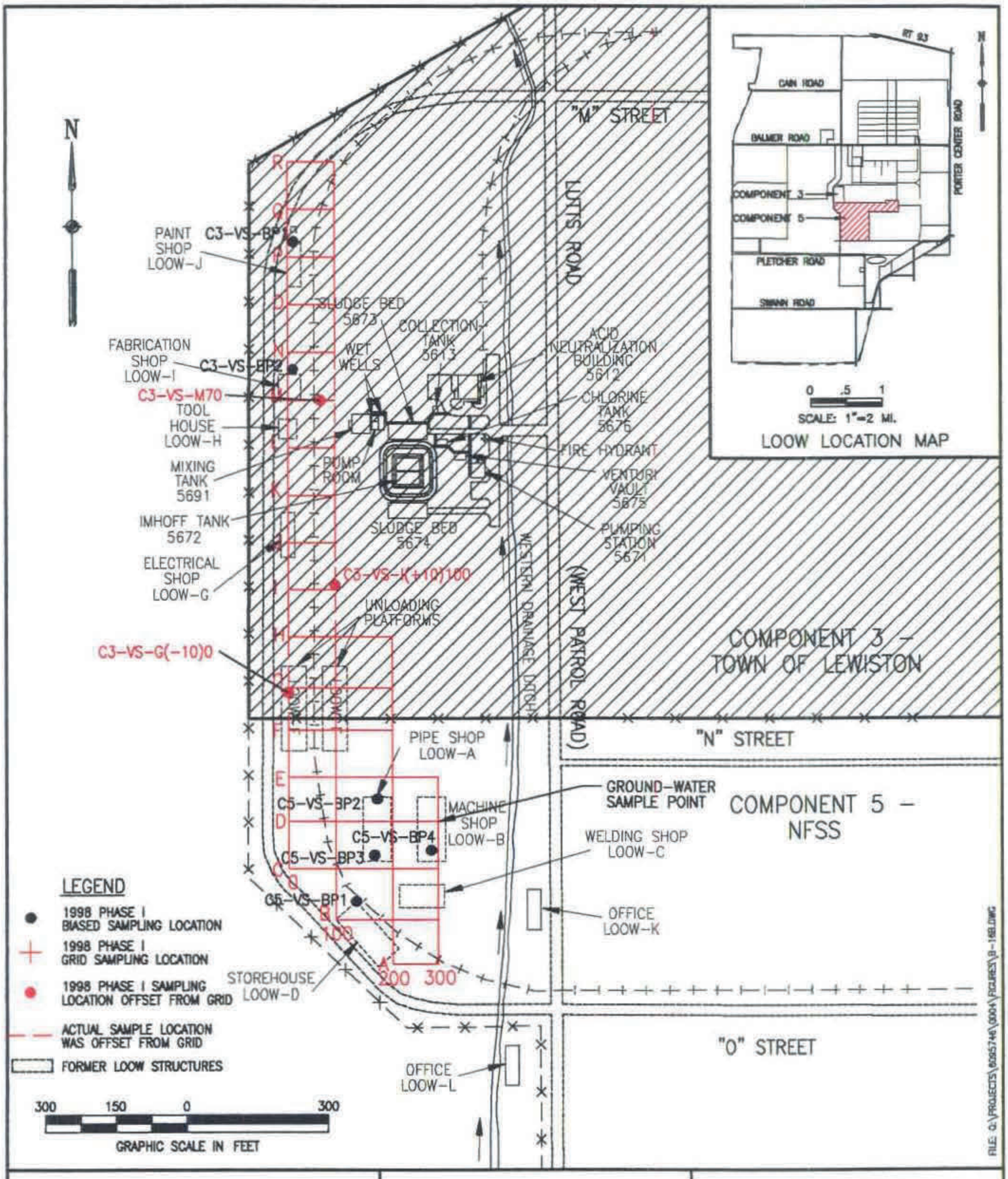
9.3.2 Vicinity Shops Area South of the WWTP

During the Phase I RI, field activities at the former LOOW WWTP Vicinity Shops included collection of surface-soil, subsurface-soil, and ground-water samples. The ground-water sampling program is discussed in Section 9.7.

A sampling grid, with approximate 100-ft intervals between sampling points, was established across the site (Figure 9.3-2). Grid points were given alphanumeric designations, with A0 being the southwestern origin of the grid. However, because of their location beyond the area of the vicinity shops, locations A0, A100, and B0 were not sampled. Twenty grid sampling locations were placed within the vicinity shops area of Component 5. Because this grid spans two separate components, the northern portion of the grid (rows G through R) is discussed in Section 7.2.



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 5 (NFSS) ACID CONCENTRATION AREA AND SHOP AREA SOUTH OF "O" STREET SAMPLING GRID LOCATIONS	DESIGNED BY DLR	DRAWN BY FDV	DATE JULY 1999	PROJECT NO. 60957.46
			CHECKED BY BCR	PROJECT MGR. HGP	SCALE AS SHOWN	FIGURE 9.3-1



EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

COMPONENT 5 (NFSS)
WWTP VICINITY SHOPS
SAMPLING GRID LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	SMS	FDV	BCR	AS SHOWN	JULY 1999	60957.46	9.3-2

TABLE 9.3-1 BIASED SAMPLING POINT RATIONALE

Biased Sampling Point	Rationale Behind Placement
C5-AC-SO-BP1	In the vicinity of the former Sellite Manufacturing Complex.
C5-AC-SO-BP2	In the vicinity of a former LOOW rail bed; also, ground scarring was observed in the area, along with metal scraps and black plastic pipe.
C5-AC-SO-BP3	In an area of orange staining.
C5-AC-SO-BP4	In the vicinity of the former Sulfur, Sellite, and Soda Ash storage area.
C5-AC-SO-BP5	In the vicinity of a former LOOW rail bed.
C5-AC-SO-BP6	Located approximately 35' north of a tank cradle area in vicinity of rail bed.
C5-AC-SO-BP7	In the vicinity of a former tank area.
C5-AC-SO-BP8	In the vicinity of the Strong Nitric Acid storage tanks.
C5-AC-SO-BP9	In the vicinity of former unknown storage tanks.
C5-AC-SO-BP10	Located in pits between sumps; also, an area devoid of vegetation was observed.
C5-AC-SO-BP11	In the vicinity of the Anhydrous Ammonia AST and Compressor Building.
C5-SO-SO-BP1	Located near a possible floor drain.
C5-SO-SO-BP2	In the vicinity of the former garage and repair shop.
C5-SO-SO-BP3	Located west of tank cradles near the former parking garage.
C5-SO-SO-BP4	In the vicinity of the former Acetylene Storage building.
C5-SO-SO-BP5	In the vicinity of the Oil and Paint Storage building.
C5-VS-SO-BP1	Located in the vicinity of the former LOOW storehouse and railroad track.
C5-VS-SO-BP2	Located adjacent to the northern edge of the former LOOW pipe shop.
C5-VS-SO-BP3	Located adjacent to the southern edge of the former LOOW pipe shop.
C5-VS-SO-BP4	Located in the southern portion of the former LOOW machine shop.

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In addition, 4 biased sampling locations were established within the southern portion of the grid. The rationale for the placement for the biased points is presented in Table 9.3-1.

Direct push technology was used to perform sampling at each grid location. Surface soil samples, ranging in depth from 0 to 1 ft bgs, and subsurface soil samples, ranging in depth from 10 to 14.5 ft bgs, were collected from each location. Soil samples were field screened for VOCs, PAHs, PCB, and TNT.

Soil field-screening results were reviewed to designate locations for collection of laboratory confirmatory samples. Those screening locations exhibiting the highest level of elevated concentrations of COPC were revisited. Samples were collected, screened, and submitted for confirmatory laboratory analysis as discussed in Sections 9.5 and 9.6.

9.4 SITE STRATIGRAPHY

9.4.1 Surface Soil

Surface soil sampled on the NFSS grid generally consisted of sand, clayey silt, or UCT. Asphalt and fill were often encountered on the margins of roads, where samples were frequently collected. Samples were generally dry (only occasionally moist). The notable exceptions were the surface-soil samples collected from directly beneath the concrete pad at D600 and D800, which consisted of an oily, black sand/silt slurry.

9.4.2 Subsurface Stratigraphy

The NFSS grid can be divided into two generalized stratigraphic areas, approximately along the division between the acid concentration area and shop area south of O Street (Figure 9.4-1). The acid concentration area subsurface was generally dry, consisting of stiff UCT that was observed to contact the GLC directly at 3 locations along the G row (approximately 11 to 14 ft bgs). The UCT generally contained laminations and thin lenses (less than 1 in.) of sand, silt, and fine gravel that were occasionally moist (i.e., G0).

Moist to wet samples collected in the acid concentration area included a wet zone encountered above refusal at F400, and a thick silt/sand slurry at 4 ft bgs at BP3 (adjacent to F400). The apparently discontinuous wet zone in this area may be related to fill or formerly disturbed soil around the former building at that location. A similar silt slurry was also observed at

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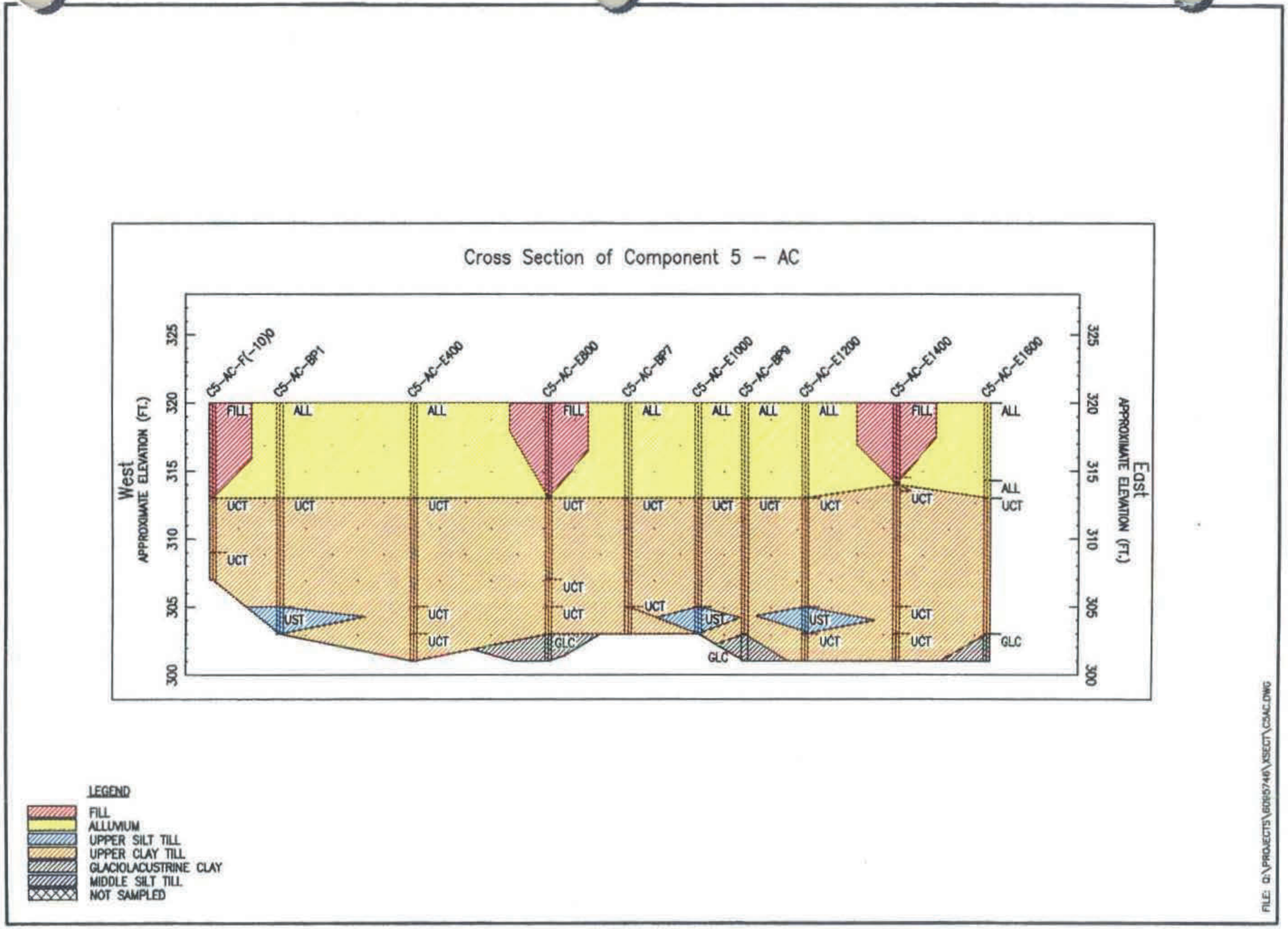

Cross Section of Component 5 - AC
West
APPROXIMATE ELEVATION (FT.)
East
APPROXIMATE ELEVATION (FT.)
325
320
315
310
305
300
C5-AC-F(-10)0
C5-AC-BP1
C5-AC-E400
C5-AC-E800
C5-AC-BP7
C5-AC-E1000
C5-AC-BP9
C5-AC-E1200
C5-AC-E1400
C5-AC-E1600
FILL
ALL
UCT
UST
GLC
LEGEND
FILL
ALLUVIUM
UPPER SILT TILL
UPPER CLAY TILL
GLACIOLACUSTRINE CLAY
MIDDLE SILT TILL
NOT SAMPLED
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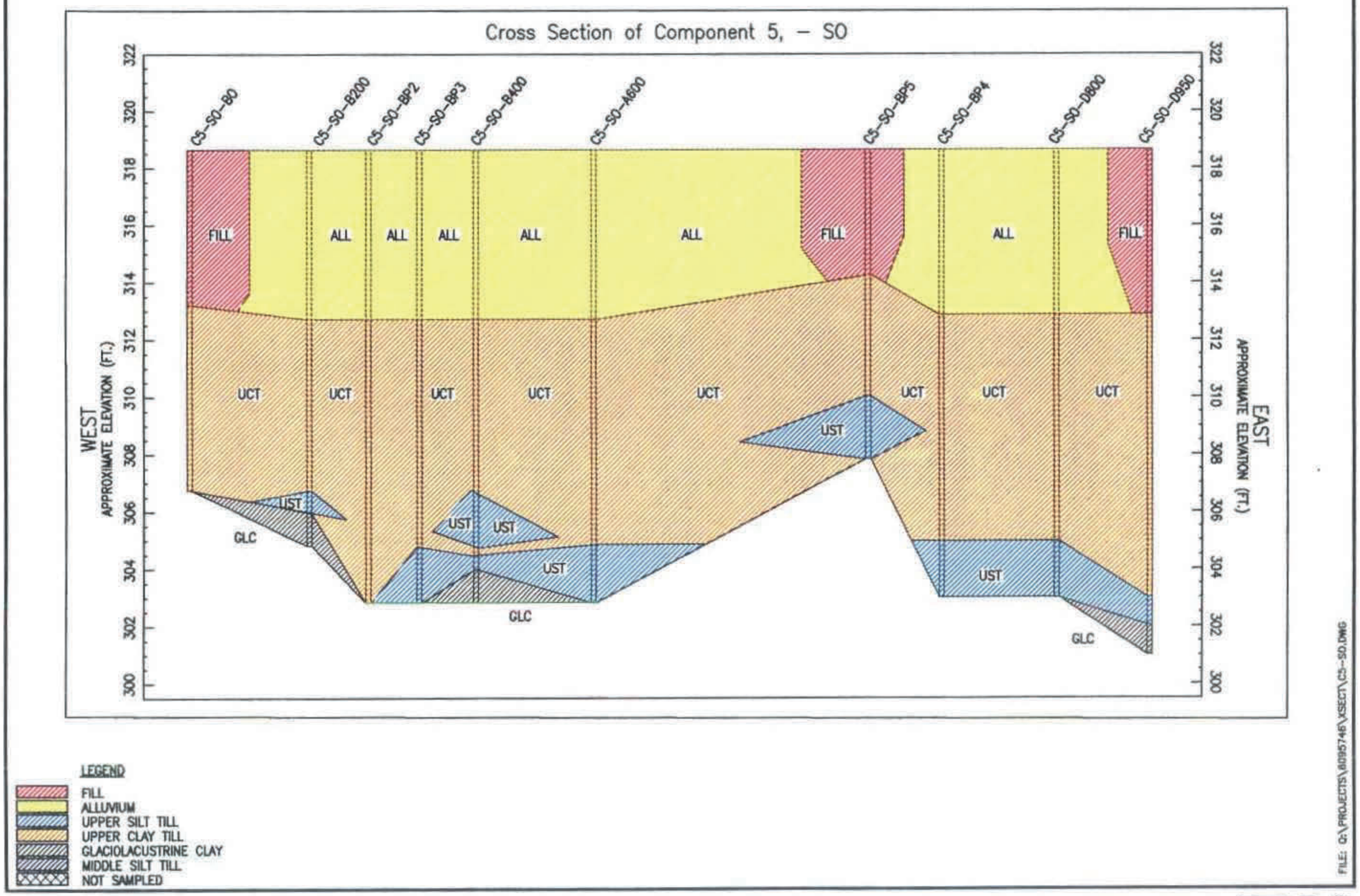
FIGURE 9.4-1



Cross Section of Component 5, - SO
C5-SO-B0
C5-SO-B200
C5-SO-BP2
C5-SO-BP3
C5-SO-B400
C5-SO-A600
C5-SO-BP5
C5-SO-BP4
C5-SO-D800
C5-SO-D950
WEST
APPROXIMATE ELEVATION (FT.)
EAST
APPROXIMATE ELEVATION (FT.)
FILL
ALL
UCT
UST
GLC
LEGEND
FILL
ALLUVIUM
UPPER SILT TILL
UPPER CLAY TILL
GLACIOLACUSTRINE CLAY
MIDDLE SILT TILL
NOT SAMPLED
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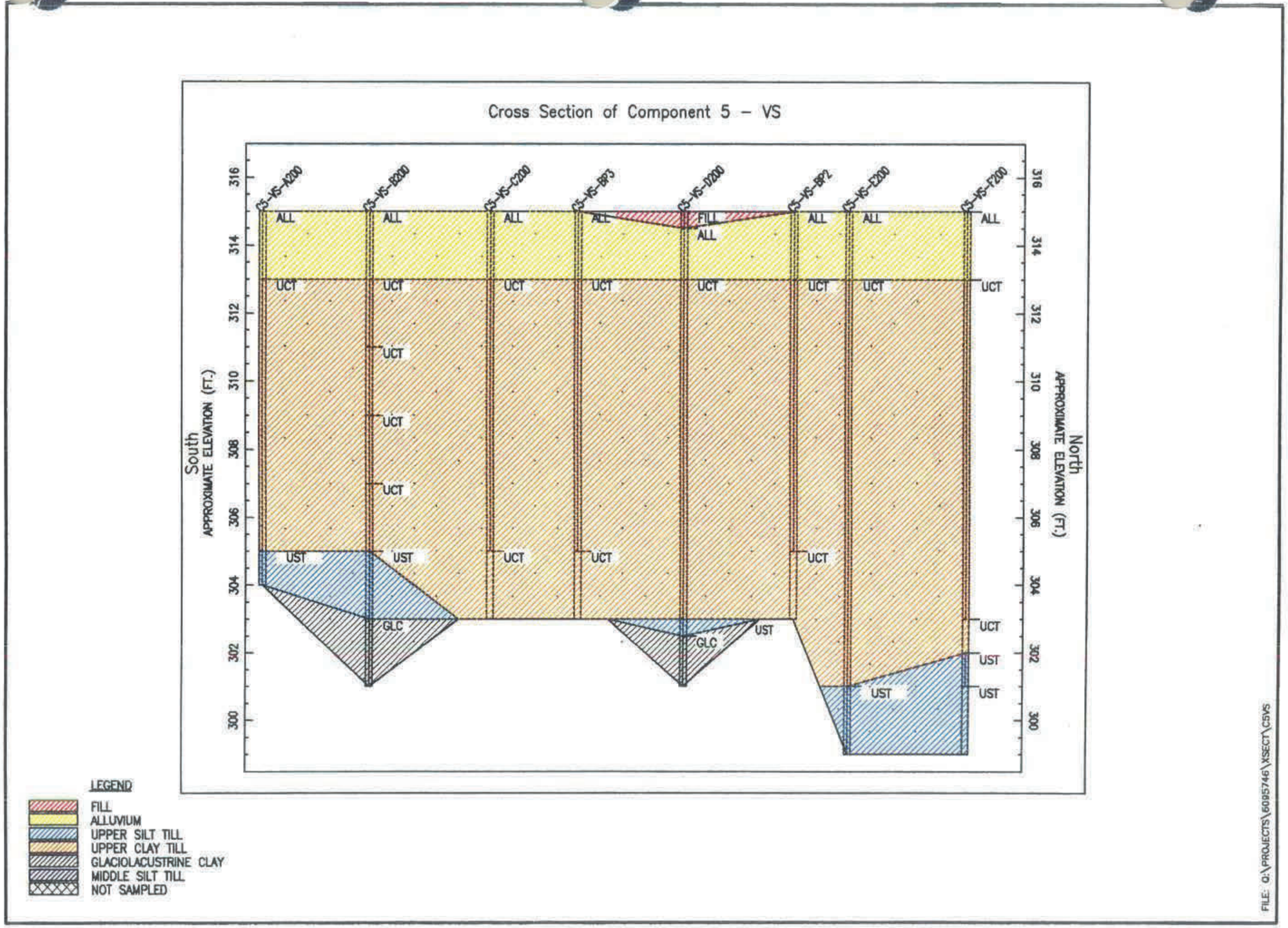
FIGURE 9.4-2



Cross Section of Component 5 - VS
South
APPROXIMATE ELEVATION (FT.)
North
APPROXIMATE ELEVATION (FT.)
C5-VS-A200
C5-VS-B200
C5-VS-C200
C5-VS-BP3
C5-VS-D200
C5-VS-BP2
C5-VS-E200
C5-VS-F200
ALL
FILL
UCT
UST
GLC
316
314
312
310
308
306
304
302
300
LEGEND
FILL
ALLUVIUM
UPPER SILT TILL
UPPER CLAY TILL
GLACIOLACUSTRINE CLAY
MIDDLE SILT TILL
NOT SAMPLED
FILE: Q:\PROJECTS\6095746\XSECT\C5VS

FIGURE 9.4-3

approximately 4 ft bgs at E1600, located adjacent to the pond (probably in direct hydraulic connection with the pond).

In the shop area, the lower portion of the UCT became increasingly interbedded with wet sand and silt layers (generally 0.5 to 1 ft in thickness) as the GLC remained approximately 11 to 14 ft bgs. Also observed were thin (1 to 2 in.), very wet and permeable coarse sand/fine gravel (1 to 2 mm) lenses, which were not observed elsewhere at the former LOOW. The gravel lenses appeared below the sand and silt layer, near the contact with the GLC. The thin, saturated silt, sand, and/or gravel lenses were a common feature of the shop area (Figure 9.4-2). The GLC apparently rises toward the south, particularly the southwest corner of the grid, approaching 9 ft bgs.

In addition, a second aquifer zone was also encountered at the shop area portion of the NFSS grid, that was described as a very saturated, sand/silt slurry. This "running sand" consistency was reported only in isolated borings at other grids (i.e. D200 and F200 of AFP-68, west of Wesson), and then generally adjacent to a building (suggesting fill material or backfilled soil that was excavated during building construction).

This slurry material was unique to the NFSS grid, in that it was widespread over a large area. The slurry was encountered in the B, C, and D rows, west of the 800-ft line. The depth from which the rods were generally coated was anywhere from 4 to 8 ft bgs. Both the slurry layer and the silt lens layers were sampled in adjacent borings, C600 and BP5, located approximately 30 ft apart. The slurry layer was encountered to approximately 8 ft bgs, and it was underlain by clay. The lower sample was collected at C600 from 13 to 13.5 ft, around a gravel lens. Notes were made on the boring logs as to the depth at which the slurry was observed on the direct push rods.

The area of the slurry layer corresponds on the surface to a very moist, swampy area that is traversed by several drainage ditches, suggesting poor natural drainage. The slurry layer was also observed at C0 and D0, adjacent to a marshy area along Campbell Street.

The stratigraphy for the vicinity shops area is discussed in Section 7.2.4 (Figure 9.4-3).

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9.5 SOIL SCREENING RESULTS

Soil screening results for the acid concentration area and shop area south of O Street, as well as the vicinity shops area are included in Table 9.5-1. Analytes that exceed 1/10th of the NY State comparison criteria have been lightly shaded. Those analytes exceeding the full value of the comparison criteria have been darkly shaded.

9.5.1 Acid Concentration Area & Shop Area South of O Street

VOCs were reported in several locations within the sampling grid. The highest concentration of VOCs, 33.08 µg/kg of ethylbenzene, was reported in location D400 at 0 to 0.5 ft bgs. The reported concentrations of VOCs did not exceed 1/10th of NY State comparison criteria.

PAHs were reported in each soil sample submitted for screening. The reported total PAH concentration for surface samples collected from SO-BP1, B600, F200, and D800 exceeded the NY State comparison criteria for total carcinogenic SVOCs. PAH concentrations did not exceed the comparison criteria in subsurface soil samples collected from the acid concentration area and the shops area south of O Street. However, several additional samples reported concentrations of PAH exceeding 1/10th of the NY State comparison criteria. Although the exceedances in the surface soil may be attributable to deteriorating road surfaces, the results for some subsurface soil samples reported concentrations of PAHs exceeding 1/10th of the comparison criteria. These locations include AC-BP10, AC-BP3, AC-BP4, AC-BP5AC-BP7, AC-BP9, F1000, G400, G800, A(-25)200, A(-25)960, A400, A800, B800, SO-BP2, C400, C800, D600, and D800.

PCB were reported in B600 and D200, but in concentrations that did not exceed the NY State comparison criteria. However, the concentrations did exceed 1/10th of the criteria.

TNT was not reported in the samples collected from the acid concentration area and main shops area south of O Street.

9.5.2 Vicinity Shops Area South of the WWTP

VOCs were reported in several locations sampled within the sampling grid. The highest concentration of VOCs, 11.08 µg/kg of 1,1-DCE, was reported in location B200 at 0 to 0.5 ft bgs. The reported concentrations did not exceed the NY State comparison criteria.

PAHs were reported in each soil sample submitted for screening. However, the reported total PAH concentration did not exceed the NY State comparison criteria. Several reported PAH concentrations exceeded 1/10th of the comparison criteria in the surface soil samples collected from within the vicinity shops area. These reported PAHs are likely due to deteriorating road surfaces and railroad beds within the area. Some results reported PAHs in concentrations exceeding 1/10th of the criteria in the subsurface. These locations included VS-BP2, C100, and F100.

TNT was reported in location B300 at 0.2 to 0.7 ft, at a concentration of 80 µg/kg. However, this concentration is less than the method detection limit for the TNT analysis at the laboratory, and was therefore not expected to be reproduced in the laboratory results. The concentration did not exceed 1/10th of the NY State comparison criteria. PCB were not reported in the field screening samples.

9.6 LABORATORY ANALYSES AND CONFIRMATORY SAMPLE RESULTS

9.6.1 Acid Concentration Area & Shop Area South of O Street

Due to the reported presence of COPC in samples F200, D200, D800, these locations were revisited. In addition, BP3 (acid concentration area) was revisited due to the presence of a water-bearing interval and its location directly down gradient of the former fuel oil ASTs. In addition to placement of a temporary ground water sampling point at this location, a soil sample was submitted for laboratory analysis. Additional samples were collected, screened, and submitted for confirmatory laboratory analysis of full suite parameters. Sample depths for those samples selected for laboratory analysis may have varied slightly from the depth of the original sample.

Re-Screening Results

Soil screening results for confirmatory samples at the acid concentration area/shop area are included in Table 9.5-1. Laboratory analytical sample results for confirmatory samples at the acid concentration area/shop area are included in Table 9.6-1. Analytes that exceed 1/10th of the NY State comparison criteria have been lightly shaded. Those analytes exceeding the full value of the criteria have been darkly shaded.

VOCs were reported in the sample collected from BP3, but in concentrations that did not exceed 1/10th of the NY State comparison criteria. PAHs were reported in all of the re-collected confirmatory samples collected from the acid concentration area and shops area. The total PAHs exceeded the NY State comparison criteria in the surface sample collected from D800. The reported PAH concentration in the re-collected sample from F200 exceeded 1/10th of the comparison criteria, but did not exceed the full value of the criteria as the original sample had. PCB and TNT were not reported in the field screening results for the laboratory confirmatory samples.

Laboratory Results

Acetone, a common laboratory contaminant, was reported in samples from locations BP3, D800, and F200 in concentrations that exceeded the NY State comparison criteria. However, acetone was also reported in the blank associated with BP3 and F200. Methylene chloride was reported at estimated concentrations exceeding the NY State comparison criteria in samples collected from BP3, F200, and D800.

The SVOC dibenzofuran exceeded 1/10th of the NY State comparison criteria in the surface soil sample collected from D800. Also, benz[a]anthracene exceeded the NY State comparison criteria in the surface sample collected from D800. Several additional PAHs exceeded 1/10th of the criteria in the surface soil sample from D800. Benz[a]anthracene, benzo[a]pyrene and dibenz[a,h]anthracene exceeded 1/10th of the criteria in the subsurface sample collected from D800 as well. Benzo[a]pyrene exceeded 1/10th of the comparison criteria in the surface soil sample collected from F200.

In addition, heptachlor epoxide was reported at a concentration exceeding the NY State comparison criteria in the surface soil sample collected from location D800. However the laboratory reported that there was greater than 25 percent difference between the results from two detector columns, which may indicate a positive or negative bias. The reported PCB concentration in the surface soil sample collected from D800 exceeded 1/10th of the comparison criteria.

Iron exceeded the NY State comparison criteria in each of the samples collected from the acid concentration area and shops area. In addition, antimony and mercury exceeded the comparison criteria in the surface soil sample collected from D800. Mercury was also reported in concentrations exceeding the criteria in the sample collected from location F200. However, the mercury concentrations were estimated, indicating a possible bias. Additional metals exceeded 1/10th of the NY State comparison criteria.

Explosives and cyanide were not reported in the samples submitted from the acid concentration area and the shops area south of O Street.

9.6.2 Vicinity Shops Area South of the WWTP

Due to the presence of TNT in the sample collected from B300, and the VOCs reported in the sample collected from D300, these locations were re-sampled, re-screened, and submitted for laboratory confirmatory analysis of full TCL/TAL analytes, boron, lithium, and explosives.

Re-Screening Results

The re-screening results reported PAHs in both samples in concentrations less than 1/10th of the NY State comparison criteria. VOCs, PCB, and TNT were not reported in the re-collected samples.

Laboratory Results

SVOCs, PAHs, and pesticides were reported in concentration that did not exceed the 1/10th of the NY State comparison criteria in the soil samples collected from the vicinity shops area.

Iron exceeded the NY State comparison criteria in both of the samples collected from the vicinity shops area. Nickel also exceeded the comparison criteria in the sample collected from location B300. Additional metals exceeded 1/10th of the NY State comparison criteria.

VOCs, PCB, cyanide, and explosives were not reported.

9.7 GROUND-WATER SAMPLING RESULTS

Due to the presence and concentration of potential COPC in field screening results and the stratigraphy indicating the presence of a water-bearing zone, temporary ground-water sampling points were installed at AC-BP3 in the acid concentration area, D800 in the shop area south of O Street, and D300 in the southern portion of the WWTP vicinity shops grid. A 1-in. diameter point was placed in AC-BP3, with the screening interval placed between 3 to 8 ft bgs, bridging a lens of saturated silt. Two-inch diameter points, screened from 4 to 14 ft bgs, were placed in locations D300 and D800. Ground-water samples were collected and submitted for laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives. A summary of reported analytes is presented in Table 9.7-1.

9.7.1 Acid Concentration Area & Shop Area South of O Street

VOCs and PAHs were reported in concentrations that did not exceed the NY State comparison criteria in the sample collected from AC-BP3. However the reported concentration of acetone exceeded $1/10^{th}$ of the comparison criteria. Iron, lead, and sodium exceeded the NY State comparison criteria. Additional metals exceeded $1/10^{th}$ of the criteria. Heptachlor epoxide, for which the comparison criteria is zero, was reported in the ground-water sample from AC-BP3. SVOCs, PCB, explosives, and cyanide were not reported in the ground-water sample collected from the acid concentration area.

The results for the ground water sample collected from the shop area (D800) reported concentrations of 1,1,1-TCA, and TCE were reported in concentrations that exceeded the NY State comparison criteria. In addition, 1,1-DCE and total 1,2-DCE exceeded $1/10^{th}$ of the criteria. The pesticide α-BHC, as well PAHs were reported, but did not exceed $1/10^{th}$ of the criteria. Reported concentrations of magnesium and sodium exceeded the NY State comparison criteria. Additional metals exceeded $1/10^{th}$ of the criteria. SVOCs, PCB, explosives, and cyanide were not reported.

9.7.2 Vicinity Shops Area South of the WWTP

The reported concentrations of antimony, iron, magnesium and sodium exceeded the NY State comparison criteria. Additional metals exceeded $1/10^{th}$ of the criteria. Although a NY State comparison criteria does not exist for lithium, the concentration of lithium reported in the ground water sample collected from the WWTP vicinity shops appeared to be elevated in comparison to the average lithium concentrations reported in the ground water samples collected during the Phase I RI. Explosives were reported but did not exceed comparison criteria. However, the reported concentration of 1,3,5-TNB exceeded $1/10^{th}$ of the criteria. VOCs, SVOCs, pesticides, PCB, and cyanide were not reported in the ground-water sample collected from the vicinity shops area.

9.8 CONCLUSIONS AND RECOMMENDATIONS

Phase I results indicate impact from potential COPC associated with the combined shops building in the shop area south of O Street and the sumps within the acid concentration area. In addition, total PAH concentrations exceeded $1/10^{th}$ of the comparison criteria in several locations throughout these two areas. Recommendations for the specific exceedances reported in each location are summarized below.

The acid concentration area and shop area south of O Street are recommended for further investigation to delineate the extent of PAHs in the surface soil at locations SO-BP1, B600, F200, and D800. In addition the PAHs exceeding 1/10th of the comparison criteria in the subsurface soil throughout the two areas are recommended for further investigation. Because acetone and methylene chloride are common laboratory contaminants, the VOCs reported in locations AC-BP3 and F200 are not recommended for further investigation. However, the VOCs as well as the SVOCs reported in the soil in location D800 are recommended for further investigation. In addition, the extent of VOCs in ground water in the vicinity of the combined shops building (i.e., locations D600 and D800) should be further investigated in the shop area south of O Street.

The extent of PCB reported in the soil samples collected from locations B600, D200, and D800 is recommended for further investigation as well.

Only two of the acid concentration sumps were sampled during the Phase I RI. Further evaluation of the potential COPC within and impact from the sumps is recommended.

In the WWTP vicinity shops area, the reported PAHs in the subsurface soil at locations VS-BP2, C100, and F100 is recommended for further investigation.

With the exception of the elevated lead reported in the ground-water sample collected at AC-BP3 and elevated lithium reported in the ground-water sample collected from D300 within the WWTP vicinity shops, the metals concentrations reported in the soil and ground-water samples collected from within Component 5 appear to be indicative of site-specific background concentrations. However, a background metals concentration evaluation is recommended to more completely evaluate the reported metals concentrations. In addition, the elevated lead and lithium are recommended for further evaluation.

The former LOOW boiler plant exists within Component 5. The area of the boiler plant was not included in this Phase I investigation due to the ongoing investigation of the NFSS associated with FUSRAP. It is recommended that possible impacts from the former LOOW boiler plant, including the possible presence of underground storage tanks, be evaluated within FUSRAP.

Further, an underground storage tank was associated with the former LOOW gas station (Building 724-1 on Figure 9.3-1). Although there appeared to be visual evidence of a tank removal in the vicinity of this area, documentation of the removal could not be located. Although investigation of tanks is not pursued under HTRW projects, these areas are recommended for further evaluation to confirm the removal and closure of these two potential underground storage tank areas. It is further recommended that these potential tank investigations be pursued through the current FUSRAP investigation.

In addition, former LOOW underground lines traversing the NFSS contain potential COPC (see Chapter 11) that may impact subsurface soil in the vicinity of the lines. It is recommended that further evaluation of the potential impact from these lines also be included in the ongoing FUSRAP investigation.

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Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-BP1-0.0-0.5	C5-AC-SO-BP1-11.5-12.0	C5-AC-SO-BP10-0.0-0.5	C5-AC-SO-BP10-13.5-14.0	C5-AC-SO-BP11-0.0-0.5	C5-AC-SO-BP11-11.5-12.0	C5-AC-SO-BP11-11.5-12.0-DUP	C5-AC-SO-BP2-0.0-0.5	C5-AC-SO-BP2-6.0-6.5	C5-AC-SO-BP3-0.0-0.5	C5-AC-SO-BP3-13.5-14.0	C5-AC-SO-BP3-13.5-14.0-DUP
E4020	PCB	UG/KG	1000	NYTAGM												NA
E4035	PAH	UG/KG	10000	NYTAGM	1142	309	3156	1178	2491	565	432	343	537	1001	1221	NA
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE												NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM							NA					
GC	BENZENE	UG/KG	60	NYTAGM							NA					
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM							NA					
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM							NA					
GC	M & P-XYLENES	UG/KG	1200	NYTAGM							NA					
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM							NA					
GC	TOLUENE	UG/KG	1500	NYTAGM							NA					
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM							NA					
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM							NA					

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-BP3-14-REP	C5-AC-SO-BP3-14.0-DUP	C5-AC-SO-BP4-0.0-0.5	C5-AC-SO-BP4-13.3-13.8	C5-AC-SO-BP5-0.0-0.5	C5-AC-SO-BP5-0.0-0.5-DUP	C5-AC-SO-BP5-11.0-11.5	C5-AC-SO-BP5-11.0-11.5-DUP	C5-AC-SO-BP6-0.0-0.5	C5-AC-SO-BP6-0.0-0.5-DUP	C5-AC-SO-BP6-13.5-14.0	C5-AC-SO-BP7-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM		NA						NA		NA		
E4035	PAH	UG/KG	10000	NYTAGM	926	NA	1331	1231	3265	3190	1280	NA	1288	NA	447	1076
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE		NA						NA		NA		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM						NA						
GC	BENZENE	UG/KG	60	NYTAGM						NA						
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM						NA						
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM						NA						
GC	M & P-XYLENES	UG/KG	1200	NYTAGM						NA						
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	2.17					NA						
GC	TOLUENE	UG/KG	1500	NYTAGM						NA						
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM						NA						
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM						NA						

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-BP7-11.0-11.5	C5-AC-SO-BP8-0.0-0.5	C5-AC-SO-BP8-13.5-14.0	C5-AC-SO-BP9-0.0-0.5	C5-AC-SO-BP9-13.5-14.0	C5-AC-SO-E1400-0.0-0.3	C5-AC-SO-E1400-13.5-14.0	C5-AC-SO-E1600-0.5-1.0	C5-AC-SO-E1600-12.0-12.5	C5-AC-SO-F(-10)0-0.0-0.5	C5-AC-SO-F(-10)0-6.0-6.3	C5-AC-SO-F1000-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM												
E4035	PAH	UG/KG	10000	NYTAGM	3631	417	590	2048	1371	2319	607	1229	284	670	407	369
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE												
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM												
GC	BENZENE	UG/KG	60	NYTAGM												
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM												
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM												
GC	M & P-XYLENES	UG/KG	1200	NYTAGM												
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM												
GC	TOLUENE	UG/KG	1500	NYTAGM												
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM			1.89									
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			0.1									

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-F1000-13.5-14.0	C5-AC-SO-F1200-0.0-0.5	C5-AC-SO-F1200-12.5-13.0	C5-AC-SO-F1400-0.0-0.5	C5-AC-SO-F1400-10.5-11.0	C5-AC-SO-F1600-0.0-0.5	C5-AC-SO-F1600-0.0-0.5-DUP	C5-AC-SO-F1600-13.5-14.0	C5-AC-SO-F200-0.0-1.0 COMP	C5-AC-SO-F200-1-REP	C5-AC-SO-F200-12.2-12.7	C5-AC-SO-F400-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM												
E4035	PAH	UG/KG	10000	NYTAGM	1854	4141	854	458	197	4180	4356	583	11847	2487	838	713
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE												
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM							NA					
GC	BENZENE	UG/KG	60	NYTAGM							NA					
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM							NA					
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM							NA					
GC	M & P-XYLENES	UG/KG	1200	NYTAGM							NA					
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM							NA					
GC	TOLUENE	UG/KG	1500	NYTAGM							NA					
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM							NA					
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM							NA					

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = etected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-F400-0.0-0.5-DUP	C5-AC-SO-F400-6.3-6.8	C5-AC-SO-F600-0.0-0.5	C5-AC-SO-F600-11.5-12.0	C5-AC-SO-F800-0.0-0.5	C5-AC-SO-F800-13.5-14.0	C5-AC-SO-G0-0.3-0.8	C5-AC-SO-G0-0.3-0.8-DUP	C5-AC-SO-G0-4.3-4.7	C5-AC-SO-G0-4.3-4.7-DUP	C5-AC-SO-G1000-0.0-0.5	C5-AC-SO-G1000-11.0-11.5	C5-AC-SO-G1000-11.0-11.5-DUP
E4020	PCB	UG/KG	1000	NYTAGM										NA			NA
E4035	PAH	UG/KG	10000	NYTAGM	658	760	1391	289	759	705	2761	2455	278	NA	1735	791	NA
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE										NA			NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA							NA					
GC	BENZENE	UG/KG	60	NYTAGM	NA							NA					
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM	NA							NA					
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM	NA							NA					
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA							NA					
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA							NA					
GC	TOLUENE	UG/KG	1500	NYTAGM	NA							NA					
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA							NA					
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA							NA					

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-G1200-0.0-0.5	C5-AC-SO-G1200-0.0-0.5-DUP	C5-AC-SO-G1200-10.0-10.5	C5-AC-SO-G1400-0.0-0.5	C5-AC-SO-G1400-10.8-11.3	C5-AC-SO-G1600-0.0-0.5	C5-AC-SO-G1600-11.5-12.0	C5-AC-SO-G200-0.0-0.5	C5-AC-SO-G200-5.5-6.0	C5-AC-SO-G400-0.0-0.5	C5-AC-SO-G400-0.0-0.5-DUP	C5-AC-SO-G400-12.0-12.5	C5-AC-SO-G400-12.0-12.5-DUP
E4020	PCB	UG/KG	1000	NYTAGM											NA		
E4035	PAH	UG/KG	10000	NYTAGM	402	612	840	695	224	1064	277	1364	340	2317	NA	2198	2189
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE											NA		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		NA											NA
GC	BENZENE	UG/KG	60	NYTAGM		NA											NA
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		NA											NA
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		NA											NA
GC	M & P-XYLENES	UG/KG	1200	NYTAGM		NA											NA
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM		NA											NA
GC	TOLUENE	UG/KG	1500	NYTAGM		NA											NA
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM		NA											NA
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		NA											NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-G600-0.0-0.5	C5-AC-SO-G600-10.0-10.5	C5-AC-SO-G800-0.0-0.5	C5-AC-SO-G800-0.0-0.5-DUP	C5-AC-SO-G800-13.5-14.0	C5-AC/SO-SO-E1000-0.0-0.5	C5-AC/SO-SO-E1000-10.0-10.5	C5-AC/SO-SO-E1200-0.0-0.5	C5-AC/SO-SO-E1200-12.0-12.5	C5-AC/SO-SO-E200-0.2-0.7	C5-AC/SO-SO-E200-0.2-0.7-DUP	C5-AC/SO-SO-E200-13.5-14.0	C5-AC/SO-SO-E400-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM													
E4035	PAH	UG/KG	10000	NYTAGM	588	409	497	736	1117	3961	247	397	724	672	752	669	1705
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE													
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM				NA				0.61			NA		
GC	BENZENE	UG/KG	60	NYTAGM				NA							NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA							NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA							NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM				NA							NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM				NA							NA		
GC	TOLUENE	UG/KG	1500	NYTAGM				NA							NA		
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM				NA							NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM				NA							NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC/SO-SO-E400-0.0-0.5-DUP	C5-AC/SO-SO-E400-14.0-14.5	C5-AC/SO-SO-E600-0.5-1.0	C5-AC/SO-SO-E600-10.0-10.5	C5-AC/SO-SO-E800-0.2-0.7	C5-AC/SO-SO-E800-12.2-12.7	C5-SO-SO-A(-25)200-0.0-0.5	C5-SO-SO-A(-25)200-11.5-12.0	C5-SO-SO-A(-25)960-0.0-0.5	C5-SO-SO-A(-25)960-10.1-10.6	C5-SO-SO-A0-0.1-0.6	C5-SO-SO-A0-6.0-6.5
E4020	PCB	UG/KG	1000	NYTAGM	NA											
E4035	PAH	UG/KG	10000	NYTAGM	NA	639	1676	501	2361	988	915	1206	1075	1698	673	690
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE	NA											
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM												
GC	BENZENE	UG/KG	60	NYTAGM												
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM												
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM												
GC	M & P-XYLENES	UG/KG	1200	NYTAGM												
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM												
GC	TOLUENE	UG/KG	1500	NYTAGM												
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM											1.22	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM												

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = no[illegible]nalyzed

blank = [illegible]tected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-SO-SO-A400-0.0-0.5	C5-SO-SO-A400-11.5-12.0	C5-SO-SO-A400-11.5-12.0-DUP	C5-SO-SO-A600-0.0-0.5	C5-SO-SO-A600-11.5-12.0	C5-SO-SO-A800-0.0-0.5	C5-SO-SO-A800-11.5-12.0	C5-SO-SO-A800-11.5-12.0-DUP	C5-SO-SO-B0-0.0-0.5	C5-SO-SO-B0-6.5-6.8	C5-SO-SO-B0-6.5-6.8-DUP	C5-SO-SO-B200-0.4-0.9	C5-SO-SO-B200-8.0-8.5
E4020	PCB	UG/KG	1000	NYTAGM			NA										
E4035	PAH	UG/KG	10000	NYTAGM	764	1185	NA	287	544	297	1049	1202	4398	980	882	394	868
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE			NA										
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM								NA			NA		
GC	BENZENE	UG/KG	60	NYTAGM								NA			NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM								NA			NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM								NA			NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM								NA			NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM								NA			NA		
GC	TOLUENE	UG/KG	1500	NYTAGM								NA			NA		
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM								NA			NA		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM								NA			NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 ***Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)***

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-SO-SO-B400-0.0-0.5	C5-SO-SO-B400-10.3-10.8	C5-SO-SO-B600-0.0-0.5	C5-SO-SO-B600-11.5-12.0	C5-SO-SO-B800-0.0-0.5	C5-SO-SO-B800-11.5-12.0	C5-SO-SO-B950-0.5-1.0	C5-SO-SO-B950-9.7-10.0	C5-SO-SO-BP1-0.5-1.0	C5-SO-SO-BP1-0.5-1.0-DUP	C5-SO-SO-BP1-11.5-12.0
E4020	PCB	UG/KG	1000	NYTAGM			280							NA	
E4035	PAH	UG/KG	10000	NYTAGM	1115	429	14269	339	2977	2064	992	528	10606	9312	661
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE											
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM			3.05							NA	
GC	BENZENE	UG/KG	60	NYTAGM										NA	
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM										NA	
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM										NA	
GC	M & P-XYLENES	UG/KG	1200	NYTAGM										NA	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM										NA	
GC	TOLUENE	UG/KG	1500	NYTAGM										NA	
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM										NA	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM										NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-SO-SO-BP2-0.0-0.5	C5-SO-SO-BP2-11.5-12.0	C5-SO-SO-BP3-0.0-0.5	C5-SO-SO-BP3-11.5-12.0	C5-SO-SO-BP4-0.0-0.5	C5-SO-SO-BP4-0.0-0.5-DUP	C5-SO-SO-BP4-11.5-12.0	C5-SO-SO-BP5-0.5-0.8	C5-SO-SO-BP5-6.0-7.0 COMP	C5-SO-SO-C0-0.1-0.6	C5-SO-SO-C0-6.2-6.5	C5-SO-SO-C200-0.1-0.6
E4020	PCB	UG/KG	1000	NYTAGM												
E4035	PAH	UG/KG	10000	NYTAGM	673	1365	633	385	4571	4631	337	1414	648	1006	498	940
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE												
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM						NA						
GC	BENZENE	UG/KG	60	NYTAGM						NA						
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM						NA						
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM						NA						
GC	M & P-XYLENES	UG/KG	1200	NYTAGM						NA						
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM			0.17	0.25		NA						
GC	TOLUENE	UG/KG	1500	NYTAGM						NA						
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM						NA			8.71			
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			0.3			NA						

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-SO-SO-C200-6.7-7.2	C5-SO-SO-C400-0.0-0.5	C5-SO-SO-C400-11.5-12.0	C5-SO-SO-C600-0.0-0.5	C5-SO-SO-C600-13.0-13.5	C5-SO-SO-C800-0.0-0.5	C5-SO-SO-C800-14.0-14.5	C5-SO-SO-C950-0.0-0.5	C5-SO-SO-C950-12.5-13.0	C5-SO-SO-C950-12.5-13.0-DUP	C5-SO-SO-D0-0.0-0.5	C5-SO-SO-D0-8.9-9.4	C5-SO-SO-D0-8.9-9.4-DUP
E4020	PCB	UG/KG	1000	NYTAGM										NA			NA
E4035	PAH	UG/KG	10000	NYTAGM	799	848	1395	973	452	5084	1156	2593	217	NA	2503	882	NA
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE										NA			NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM													
GC	BENZENE	UG/KG	60	NYTAGM													
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM													
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM													
GC	M & P-XYLENES	UG/KG	1200	NYTAGM													
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM													
GC	TOLUENE	UG/KG	1500	NYTAGM													
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM													
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM													

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-SO-SO-D200-0.1-0.6	C5-SO-SO-D200-8-REP	C5-SO-SO-D200-8.0-8.5	C5-SO-SO-D400-0.0-0.5	C5-SO-SO-D400-10.0-10.5	C5-SO-SO-D400-10.0-10.5-DUP	C5-SO-SO-D600-0.0 GRAB	C5-SO-SO-D600-10.0 GRAB	C5-SO-SO-D600-6.0-6.5	C5-SO-SO-D800-0.5-1.0	C5-SO-SO-D800-0.5-1.0-DUP
E4020	PCB	UG/KG	1000	NYTAGM	220		260								NA
E4035	PAH	UG/KG	10000	NYTAGM	562	578	447	702	860	939	813	1186	457	10965	NA
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE											NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM						NA					
GC	BENZENE	UG/KG	60	NYTAGM						NA	0.13	0.2			1.97
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM						NA					0.45
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				33.08	17.18	NA				12.52	12.73
GC	M & P-XYLENES	UG/KG	1200	NYTAGM						NA					
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM						NA	0.43	0.37			
GC	TOLUENE	UG/KG	1500	NYTAGM						NA					
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM						NA	8.76	5.13			1.06
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM						NA	0.55	0.14			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-SO-SO-D800-1-REP	C5-SO-SO-D800-10-REP	C5-SO-SO-D800-10.4-10.9	C5-SO-SO-D950-0.0-0.5	C5-SO-SO-D950-12.0-12.5	C5-SO-SO-E(+10)10-0.0-0.5	C5-SO-SO-E(+10)10-9.0-9.5	C5-VS-SO-A200-0.0-0.5	C5-VS-SO-A200-10.1-10.6	C5-VS-SO-A300-12.2-12.7	C5-VS-SO-B100-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM											
E4035	PAH	UG/KG	10000	NYTAGM	28148	2977	4070	985	773	5906	599	1106	402	974	2373
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE											
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM											
GC	BENZENE	UG/KG	60	NYTAGM											
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM											
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM			15.56								
GC	M & P-XYLENES	UG/KG	1200	NYTAGM											
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM											0.62
GC	TOLUENE	UG/KG	1500	NYTAGM											0.72
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM											
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM											

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = no[illegible]alyzed
blank = [illegible]tected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-VS-SO-B100-10.5-11.0	C5-VS-SO-B100-10.5-11.0-DUP	C5-VS-SO-B200-0.0-0.5	C5-VS-SO-B200-10.0-10.5	C5-VS-SO-B300-0.2-0.7	C5-VS-SO-B300-1-REP	C5-VS-SO-B300-12.2-12.7	C5-VS-SO-BP1-0.0-0.5	C5-VS-SO-BP1-11.5-12.0	C5-VS-SO-BP2-0.0-0.5	C5-VS-SO-BP2-11.5-12.0	C5-VS-SO-BP3-0.0-0.5	C5-VS-SO-BP3-11.5-12.0	C5-VS-SO-BP3-11.5-12.0-DUP
E4020	PCB	UG/KG	1000	NYTAGM														NA
E4035	PAH	UG/KG	10000	NYTAGM	353	353	3786	537	743	566	521	362	279	417	1061	748	979	NA
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE					80									NA
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM		NA	11.08											
GC	BENZENE	UG/KG	60	NYTAGM		NA												
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM		NA	6.07											
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM		NA												
GC	M & P-XYLENES	UG/KG	1200	NYTAGM		NA												
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	0.4	NA												
GC	TOLUENE	UG/KG	1500	NYTAGM	0.47	NA												
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM		NA										1.94		
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM		NA												

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-VS-SO-BP4-0.0-0.5	C5-VS-SO-BP4-11.5-12.0	C5-VS-SO-BP4-11.5-12.0-DUP	C5-VS-SO-C0-0.1-0.6	C5-VS-SO-C0-14.0-14.5	C5-VS-SO-C100-0.0-0.5	C5-VS-SO-C100-12.0-12.5	C5-VS-SO-C200-0.0-0.5	C5-VS-SO-C200-10.0-10.5	C5-VS-SO-C300-0.0-0.5	C5-VS-SO-C300-0.0-0.5-DUP	C5-VS-SO-C300-12.0-13.0 COMP	C5-VS-SO-D0-0.0-0.5
E4020	PCB	UG/KG	1000	NYTAGM													
E4035	PAH	UG/KG	10000	NYTAGM	946	378	385	1134	466	345	1358	374	612	1006	994	824	293
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE													
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM			NA								NA		
GC	BENZENE	UG/KG	60	NYTAGM			NA								NA		
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM			NA								NA		
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM			NA								NA		
GC	M & P-XYLENES	UG/KG	1200	NYTAGM			NA					0.04			NA		
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM			NA			0.04		0.13	0.03	0.09	NA	0.06	
GC	TOLUENE	UG/KG	1500	NYTAGM			NA			0.13		0.38	0.07	0.33	NA	0.09	
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM			NA				0.3	0.51	0.35	0.45	NA	0.41	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			NA			0.01		0.07	0.01	0.27	NA	0.01	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-VS-SO-D0-0.0-0.5-DUP	C5-VS-SO-D0-14.3-14.8	C5-VS-SO-D100-0.1-0.6	C5-VS-SO-D100-12.0-12.5	C5-VS-SO-D200-0.4-0.9	C5-VS-SO-D200-12.0-12.5	C5-VS-SO-D300-0.2-0.7	C5-VS-SO-D300-14-REP	C5-VS-SO-D300-14.0-14.3	C5-VS-SO-D300-14.0-14.3-DUP	C5-VS-SO-E0-0.5-1.0	C5-VS-SO-E0-12.2-12.7	C5-VS-SO-E0-12.2-12.7-DUP	C5-VS-SO-E100-0.1-0.6	C5-VS-SO-E100-12.2-12.7
E4020	PCB	UG/KG	1000	NYTAGM										NA			NA		
E4035	PAH	UG/KG	10000	NYTAGM	293		213	342	280	280	500	436	368	NA	808	667	NA	2227	801
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE										NA			NA		
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	NA								2.71	2.62					0.1
GC	BENZENE	UG/KG	60	NYTAGM	NA								1.56						
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM	NA								2.01	2.88					
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM	NA														
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	NA													1.68	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	NA		0.06	0.03		0.03	0.23		0.34						
GC	TOLUENE	UG/KG	1500	NYTAGM	NA		0.1	0.09		0.05	0.53		2.1	1.25				0.98	2.07
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	NA		0.78	0.39	0.41	0.36									
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	NA		0.03	0.03	0.01	0.01								0.18	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-VS-SO-E200-0.1-0.6	C5-VS-SO-E200-14.0-14.5	C5-VS-SO-E300-0.3-0.8	C5-VS-SO-E300-0.3-0.8-DUP	C5-VS-SO-E300-14.0-14.5	C5-VS-SO-F0-0.2-0.7	C5-VS-SO-F0-13.2-13.7	C5-VS-SO-F100-0.3-0.8	C5-VS-SO-F100-0.3-0.8-DUP	C5-VS-SO-F100-14.7-15.2	C5-VS-SO-F200-0.0-0.5	C5-VS-SO-F200-14.0-14.5	C7-NFSS-SO-PIPE1
E4020	PCB	UG/KG	1000	NYTAGM													
E4035	PAH	UG/KG	10000	NYTAGM	327	294	439	416	341	651	406	422	450	1908	1436	350	2498
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE													
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM				NA					NA				
GC	BENZENE	UG/KG	60	NYTAGM				NA		2.97	2.64	1.87	NA	2.37	2.54	2.29	
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA					NA				
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM			0.14	NA					NA				
GC	M & P-XYLENES	UG/KG	1200	NYTAGM			0.75	NA					NA				
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	0.24		0.1	NA	0.06				NA				
GC	TOLUENE	UG/KG	1500	NYTAGM	0.58	0.55	0.69	NA	0.15				NA				
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM			0.5	NA	0.27				NA				
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM			0.05	NA	0.03				NA				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.5-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C7-NFSS-SO-PIPE2
E4020	PCB	UG/KG	1000	NYTAGM	620
E4035	PAH	UG/KG	10000	NYTAGM	17792
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE	200
GC	1,1-DICHLOROETHYLENE	UG/KG	400	NYTAGM	
GC	BENZENE	UG/KG	60	NYTAGM	
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM	
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM	
GC	M & P-XYLENES	UG/KG	1200	NYTAGM	
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	
GC	TOLUENE	UG/KG	1500	NYTAGM	
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM	
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 9.6-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-BP3-14-REP	C5-AC-SO-F200-1-REP	C5-SO-SO-D200-8-REP	C5-SO-SO-D800-1-REP	C5-SO-SO-D800-10-REP	C5-VS-SO-B300-1-REP	C5-VS-SO-D300-14-REP	C7-NFSS-SO-PIPE1	C7-NFSS-SO-PIPE2
E160.3	PERCENT MOISTURE	%			13.3	9	26.2	15.3	14.8	13.9	14.3	13.7	7.1
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	10900 *	8990 *	17800	4820 *	9200 *	16900	10400	19900	8570
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.47 BN*	0.36 BN*	0.74 BN	1.1 N*	0.51 BN*	0.56 BN	0.42 BN	0.43 BN	0.21 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	2.9	5.7	2.1	6.9	1.5	4.5	2.3	2.9	5.8
SW6010	BARIUM	MG/KG	300	NYTAGM	96.7	101	142 E	83.4	104	279 E	73.5 E	108 E	141 E
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.44 B	0.5 B	0.68	0.22 B	0.36 B	0.78	0.38 B	0.79	0.45 B
SW6010	BORON	MG/KG			3 B	2.9 B	8 B	1.7 B	2 B	5.8 BN	4.6 B	6.4 B	3.1 B
SW6010	CALCIUM	MG/KG			49300	45600	43600	16600	60800	3730	48700	23300	8820
SW6010	CHROMIUM	MG/KG	50	NYTAGM	16 *	12.9 *	23.7 N	9.4 *	13.9 *	22.3 N	15.2 N	17.2 N	9.9 N
SW6010	COBALT	MG/KG	30	NYTAGM	8.7	8.6	11	3 B	8	19.7	8.5	8.8	9.7
SW6010	COPPER	MG/KG	50	NYTAGM-BG	30 N	30.4 N	25	25.8 N	28.8 N	37.5	23.2	74.6	67.5
SW6010	IRON	MG/KG	2000	NYTAGM	23700	20800	33300	15900	22400	36200	23000	24300	24900
SW6010	LEAD	MG/KG	400	NYTAGM	5.6 *	10.1 *	9.6	76.9 *	6.2 *	9.6	5.2	14.4	13
SW6010	LITHIUM	MG/KG			26.2 *	16.2 *	37.3	5.6 *	20.6 *	30.7	25.6	37.4	12.9
SW6010	MAGNESIUM	MG/KG			10500	7020	12300	5430	8770	7210	10100	2240	3180
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	566	1140	472	500	689	3670	625	400	3590
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	21.1 *	14.3 *	28.7	11.3 *	17.6 *	46	20.2	20.4	14.7
SW6010	POTASSIUM	MG/KG			2000 *	907 *	3240	591 *	1240 *	1180 N	1660	1060	621
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG		0.52 B							0.25 B
SW6010	SODIUM	MG/KG			753	245	381	233	180	255	423	147	113
SW6010	VANADIUM	MG/KG	150	NYTAGM	19.8	19.4	28.3	9.2	18.4	29.6	17.8	17.4	16.8
SW6010	ZINC	MG/KG	76	NYTAGM-BG	62.3 N*	41.1 N*	65.9 N	158 N*	45 N*	59.2 N	47 N	91.5 N	40 N
SW7471	MERCURY	MG/KG	0.1	NYTAGM	0.07 B	0.4 B	0.08 B	0.13 B			0.07 B	0.15 B	
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG			0.14 B						0.13 B
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM									13 P
SW8081	ALDRIN	UG/KG	41	NYTAGM	0.24 P								
SW8081	ALPHA-CHLORDANE	UG/KG	540	NYTAGM								45 EP	340 EP

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

Table 9.6-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-BP3-14-REP	C5-AC-SO-F200-1-REP	C5-SO-SO-D200-8-REP	C5-SO-SO-D800-1-REP	C5-SO-SO-D800-10-REP	C5-VS-SO-B300-1-REP	C5-VS-SO-D300-14-REP	C7-NFSS-SO-PIPE1	C7-NFSS-SO-PIPE2
SW8081	DELTA-BHC	UG/KG	300	NYTAGM									2.3 P
SW8081	DIELDRIN	UG/KG	44	NYTAGM								130	850
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	0.36 P		1.1 P				1 P	1.6 P	2.9 P
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM				110 P				0.86 P	
SW8081	METHOXYCHLOR	UG/KG											23
SW8082	AROCLOR 1260	UG/KG	1000	NYTAGM				130	26				
SW8260B	ACETONE	UG/KG	200	NYTAGM	980 B	570 JB		770 JB	870 J			730 JB	
SW8260B	METHYLENE CHLORIDE	UG/KG	100	NYTAGM	220 J	140 J		150 J	150 J				
SW8270C	BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	50000	NYTAGM		490	450	330	580		600		
SW8270C	CARBAZOLE	UG/KG						2700					
SW8270C	DI-N-OCTYL PHTHALATE	UG/KG	50000	NYTAGM						150			
SW8270C	DIBENZOFURAN	UG/KG	6200	NYTAGM				930					
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM		51		25000 D	180				43
SW8310	ACENAPHTHYLENE	UG/KG	41000	NYTAGM		87		290					
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM		5.5		3100 D	18			1.2	33
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM		4.6	0.76	5500 D	38		0.65	2.3	42
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM		10		4700 D	45			2.5	4.7
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM		5.9	3.5	5800 D	80	2.5	3.3	5.8	11
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM		48	2.7	3100 D	100	1.7	2.6	4.5	6.6
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM		2.5	0.74	2400 D	37		0.61	2.2	4.7
SW8310	CHRYSENE	UG/KG	400	NYTAGM		7.1	4	3800 D	35		1.9		
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM				390	5				
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM		27	1.8	16000 D	120		1.6	8.6	29
SW8310	FLUORENE	UG/KG	50000	NYTAGM		14		1100 D	6.9				30
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM		8.6		1900 D	26		1.6	2.3	
SW8310	NAPHTHALENE	UG/KG	13000	NYTAGM		100		2000	19				110
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	1.6	44	2.4	13000 D	80	2.5	2.3	6.9	57

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = r alyzed

blank = tected

Table 9.6-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-SO-BP3-14-REP	C5-AC-SO-F200-1-REP	C5-SO-SO-D200-8-REP	C5-SO-SO-D800-1-REP	C5-SO-SO-D800-10-REP	C5-VS-SO-B300-1-REP	C5-VS-SO-D300-14-REP	C7-NFSS-SO-PIPE1	C7-NFSS-SO-PIPE2
SW8310	PYRENE	UG/KG	50000	NYTAGM	0.82	13	2.5	12000 D	92	1.6	2.4	6.3	30
SW9060	TOTAL ORGANIC CARBON	MG/KG			NA	NA	NA	NA	NA	28700	NA	NA	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 9.7-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-GW-BP3	C5-SO-GW-D800	C5-VS-GW-D300
SW6010	ALUMINUM	D	UG/L			385	164 B	301 *
SW6010	ALUMINUM	T	UG/L			3740	8810	987 *
SW6010	ANTIMONY	D	UG/L	3	NYGUIDANCE	2.5 B	2.9 B	6.4
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	2.8 B	3.6 B	6
SW6010	ARSENIC	D	UG/L	25	NYSTANDARD	6.6 B	4.3 B	10.2
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD	14.5	7 B	12.5
SW6010	BARIUM	D	UG/L	1000	NYSTANDARD	19.5 B	45.3 B	23.8 B
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	45.6 B	108 B	24.7 B
SW6010	BORON	D	UG/L	1000	NYSTANDARD	75.7 B	88.7 B	238
SW6010	BORON	T	UG/L	1000	NYSTANDARD	133	90.9 B	235
SW6010	CALCIUM	D	UG/L			576000	140000	402000
SW6010	CALCIUM	T	UG/L			576000 E*	151000	298000
SW6010	CHROMIUM	T	UG/L	50	NYSTANDARD	6.9 B	9 B	
SW6010	COPPER	D	UG/L	200	NYSTANDARD		3.1 B	
SW6010	COPPER	T	UG/L	200	NYSTANDARD		18.4	3.4 BE
SW6010	IRON	D	UG/L	300	NYSTANDARD	18500		
SW6010	IRON	T	UG/L	300	NYSTANDARD	29000 E*	12700	1400 *
SW6010	LEAD	D	UG/L	25	NYSTANDARD	1.5 B		
SW6010	LEAD	T	UG/L	25	NYSTANDARD	25.3	2.9 BE	
SW6010	LITHIUM	D	UG/L			4 B	88.4	221
SW6010	LITHIUM	T	UG/L			12.3	98.8	247
SW6010	MAGNESIUM	D	UG/L	35000	NYSTANDARD	92000	292000	1300000
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	86000 *	279000	1360000
SW6010	MANGANESE	D	UG/L	300	NYSTANDARD	1430	161	285
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	1520 *	429	251
SW6010	NICKEL	T	UG/L				11.3 B	
SW6010	POTASSIUM	D	UG/L			912 B	3630	9360 EN

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 9.7-1 Component 5, Acid Concentration Area, Shop Area South of "O" Street, Shops Area South of WWTP and WWTP Vicinity Shops, Summary of Detected Analytes in Ground Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C5-AC-GW-BP3	C5-SO-GW-D800	C5-VS-GW-D300
SW6010	POTASSIUM	T	UG/L			1910 *	6140	9030 EN
SW6010	SELENIUM	D	UG/L	10	NYSTANDARD	7.7	3.1 B	6
SW6010	SELENIUM	T	UG/L	10	NYSTANDARD	5.2	4.6 B	7.3
SW6010	SODIUM	D	UG/L	20000	NYSTANDARD	24300	140000	817000
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	19000 *	129000	851000
SW6010	VANADIUM	T	UG/L				12.4 B	
SW6010	ZINC	T	UG/L	300	NYSTANDARD	216	22.2	
SW7470	MERCURY	D	UG/L	2	NYSTANDARD			0.12 B
SW7470	MERCURY	T	UG/L	2	NYSTANDARD			0.15 B
SW8081	ALPHA-BHC	N	UG/L	0	NYSTANDARD		0.01 P	
SW8081	HEPTACHLOR EPOXIDE	N	UG/L	0	NYSTANDARD	0.01 P		
SW8260B	1,1,1-TRICHLOROETHANE	N	UG/L	5	NYSTANDARD		6	
SW8260B	1,1-DICHLOROETHYLENE	N	UG/L	5	NYSTANDARD		2	
SW8260B	1,2-DICHLOROETHENE, TOTAL	N	UG/L	5	NYSTANDARD		2	
SW8260B	2-BUTANONE	N	UG/L	50	NYGUIDANCE		1	
SW8260B	ACETONE	N	UG/L	50	NYGUIDANCE	6		
SW8260B	CARBON DISULFIDE	N	UG/L			0.4		
SW8260B	TRICHLOROETHYLENE	N	UG/L	5	NYSTANDARD		5	
SW8310	ACENAPHTHENE	N	UG/L	20	NYGUIDANCE	0.5		
SW8310	ANTHRACENE	N	UG/L	50	NYGUIDANCE	0.05		
SW8310	FLUORANTHENE	N	UG/L	50	NYGUIDANCE	0.35		
SW8310	FLUORENE	N	UG/L	50	NYGUIDANCE	0.15		
SW8310	PHENANTHRENE	N	UG/L	50	NYSTANDARD	0.05	0.01	
SW8310	PYRENE	N	UG/L	50	NYGUIDANCE	0.2		
SW8330	1,3,5-TRINITROBENZENE	N	UG/L	5	NYSTANDARD		1.5	1.4
SW8330	HMX	N	UG/L					0.42

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
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10. COMPONENT 6 (MODERN DISPOSAL) DATA RESULTS AND EVALUATION

10.1 SITE BACKGROUND

Modern Disposal, Inc. (Modern) currently owns approximately 476 acres in the south central area of the former LOOW TNT production facility. A portion of the property was formerly used by the AEC in the 1950s for various storage activities. The extreme eastern portion of the property was formerly owned by the Air Force in the 1950s for the Control Area of a NIKE Missile Base.

Seven buildings from the former LOOW facility were located on the property currently owned by Modern. These buildings are no longer in existence, but the remnants of some building foundations can be observed on the site. This investigation focused on the potential impacts from activities associated with the former LOOW incinerator. There have been no previous investigations of this area.

10.2 FIELD RECONNAISSANCE AND SURFACE FEATURES

The area investigated on Modern property consists of an asphalt parking area and road, located off of the northwest corner of the Modern garage/shop building. This garage/shop is located just inside the main entrance of the facility. The parking lot is graded away from the building, gently sloping to the northwest towards the active scale house. There is no remaining evidence of the former LOOW incinerator. The borings were drilled to a depth of 14 ft bgs.

10.3 SOIL SAMPLING PROGRAM

Field activities at the former LOOW incinerator during the Phase I RI included collection of one semi-subsurface soil sample and five subsurface soil samples. The samples were field screened for VOCs, PAHs, PCB, and TNT (Figure 10.3-1). The sampling locations were placed in an approximate 50-ft square around the area of the former incinerator. The biased point was placed in the center of the sampling square. Field screening for VOCs in the subsurface sample in the biased point location was inadvertently not performed. Due to the extensive grading of the area by Modern, surface soil samples were not collected. An area of staining, observed in BP1 at 3 ft bgs, led to the collection of the one semi-subsurface soil sample.

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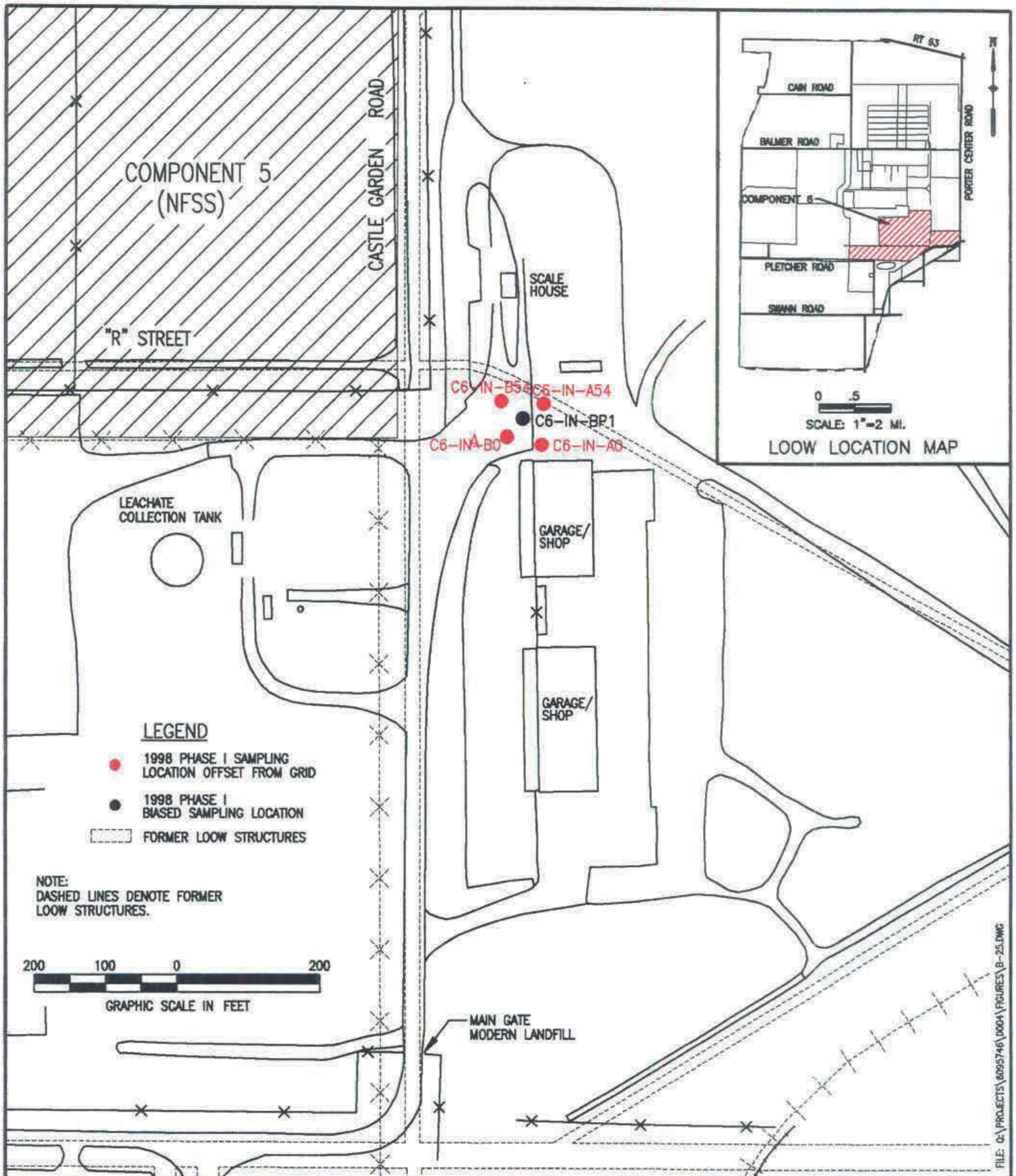

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

COMPONENT 6 (MODERN DISPOSAL)
FORMER LOOW INCINERATOR
SAMPLING GRID LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	DLR	FDV	BCR	AS SHOWN	JULY 1999	60957.46	10.3-1

10.4 SITE STRATIGRAPHY

10.4.1 Surface Soil

Soil collected from BP1 (3 ft bgs) exhibited black-gray staining and a high PID reading. It is not known whether this black-gray staining is from the former LOOW roadbed, from material associated with the former incinerator, or from site use by Modern.

10.4.2 Subsurface Stratigraphy

Subsurface samples were collected at an interval of 12 to 14 ft bgs and were generally characterized as firm, mottled UCT with minor silt and gravel. Soil cuttings from approximately 3 to 5 ft bgs, described as dark-gray, moist, silty sand and gravel, exhibited PID readings of 482 ppm. The UST unit was not encountered.

In general, a moderate amount of ground water was reported in subsurface strata at the Modern property.

10.5 SOIL SCREENING RESULTS

Soil screening results for confirmatory samples at the former LOOW incinerator can be found in Table 10.5-1. Analytes which exceed soil screening criteria have been shaded.

VOCs, TNT, and PCB were not reported in field-screening samples collected at the former LOOW incinerator. PAHs were reported in each soil sample submitted for field screening. The reported total PAH concentration of the sample collected from the stained interval (3 ft bgs) of location BP1 exceeded the NY State comparison criteria of 10,000 µg/kg for total carcinogenic SVOCs. The reported PAH concentration for this sample was 19,088 µg/kg.

10.6 LABORATORY ANALYSES AND CONFIRMATORY SAMPLE RESULTS

Due to the location within the center of the former LOOW incinerator area, and the reported PAHs in the shallow interval, BP1 was revisited. An additional subsurface sample (from 14 ft bgs) was collected, screened, and submitted for confirmatory laboratory analysis of full TCL/TAL analytes, boron, lithium, and explosives.

Re-screening Results

PAHs were reported in concentrations that did not exceed 1/10th of the NY State comparison criteria. VOCs, TNT, and PCB were not reported in the re-collected sample from BP1 (Table 10.5-1).

Laboratory Analytical Results

Laboratory analytical sample results for confirmatory samples at the former incinerator can be found in Table 10.6-1. Analytes which exceed 1/10th of the NY State comparison criteria have been lightly shaded. Analytes that exceed the full value of the criteria have been darkly shaded.

Reported concentrations of antimony and copper exceeded the NY State comparison criteria. Additional metals exceeded 1/10th of the comparison criteria. One SVOC (di-*n*-octylphthalate) and several PAHs were reported in concentrations that did not exceed 1/10th of the NY State comparison criteria.

VOCs, pesticides, PCB, explosives, and cyanide were not reported in the results from the soil sample collected from BP1.

10.7 GROUND-WATER SAMPLING AND RESULTS

Due to the location of this sampling grid within a high-traffic area, ground water at the former LOOW incinerator site was not sampled.

10.8 CONCLUSIONS AND RECOMMENDATIONS

Further evaluation of the black staining and associated PAHs reported in the 3 ft bgs interval at the former LOOW incinerator is recommended.

Table 10.5-1 Component 6, Former LOOW Incinerator, Summary of Detected Analytes in Soil (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C6-IN-SO-A0-13.5-14.0	C6-IN-SO-A54-13.5-14.0	C6-IN-SO-B0-13.5-14.0	C6-IN-SO-B0-13.5-14.0-DUP	C6-IN-SO-B54-13.5-14.0	C6-IN-SO-B54-13.5-14.0-DUP	C6-IN-SO-BP1-13.5-14.0-DUP	C6-IN-SO-BP1-14-REP	C6-IN-SO-BP1-3.0
E4035	PAH	UG/KG	10000	NYTAGM	406	449	680	NA	377	NA	392	408	19088

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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Table 10.6-1 Component 6, Former LOOW Incinerator, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C6-IN-SO-BP1-14-REP
E160.3	PERCENT MOISTURE	%			18.1
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US	15000
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	0.6 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	2.6
SW6010	BARIUM	MG/KG	300	NYTAGM	97.5 E
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG	0.57 B
SW6010	BORON	MG/KG			7.1 BN
SW6010	CALCIUM	MG/KG			60000
SW6010	CHROMIUM	MG/KG	50	NYTAGM	20.4 N
SW6010	COBALT	MG/KG	30	NYTAGM	11
SW6010	COPPER	MG/KG	50	NYTAGM-BG	35.5
SW6010	IRON	MG/KG	2000	NYTAGM	31300
SW6010	LEAD	MG/KG	400	NYTAGM	6.6
SW6010	LITHIUM	MG/KG			33.8
SW6010	MAGNESIUM	MG/KG			11500
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	679
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	26
SW6010	POTASSIUM	MG/KG			2500 N
SW6010	SODIUM	MG/KG			311
SW6010	VANADIUM	MG/KG	150	NYTAGM	25.9
SW6010	ZINC	MG/KG	76	NYTAGM-BG	55.6 N
SW8270C	DI-N-OCTYL PHTHALATE	UG/KG	50000	NYTAGM	450
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	2.1
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM	1.8
SW8310	CHRYSENE	UG/KG	400	NYTAGM	1.7
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	1.5
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	1.1

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 10.6-1 Component 6, Former LOOW Incinerator, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C6-IN-SO-BP1-14-REP
SW8310	PYRENE	UG/KG	50000	NYTAGM	1.1

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

11. COMPONENT 7 (LOOW UTILITIES) DATA RESULTS AND EVALUATION

Based on review of historical information and results of previous investigations, there is a possibility of impact from former LOOW utilities. Therefore the utilities were included in the Phase I RI. Using available site maps and inductive magnetometry, some sections of the former LOOW utilities, including sanitary sewer lines, acid waste sewer lines, storm sewer lines, and the 30-in. outfall line, were located.

Contents (i.e., sludge and/or wastewater) of some portions of the acid, sanitary, and storm sewer lines were accessed through existing manholes. In some locations the lines were excavated to gain access. Samples collected from within the lines were field-screened and submitted to the laboratory for analysis of either TCL/TAL analytes, boron, lithium, and explosives; or DOD marker compounds, depending on the location of the manhole and the possibility of impact from non-DOD sources. Generally, those manholes on CWM property in the vicinity of and north of M Street, and those manholes down gradient of the confluence of underground lines coming from M Street and areas south, were submitted for DOD marker compounds. Those manholes associated with the main underground lines coming from the south (prior to the confluence with lines coming from CWM property) were sampled for full suite parameters. Figure 11-1 shows the approximate location of the sewer utilities, the former LOOW manholes that were discovered, and individual sample locations.

Investigation of the 30-in. outfall line included evaluation of the surrounding media through collection of subsurface soil samples at regular intervals along the length of the pipeline at the depth of the pipeline. Figure 11-2 shows the location of the 30-in. outfall line and individual sample locations.

In addition to the underground utilities, several sumps were located on Component 5 in the acid concentration area. The sumps were excavated and contents of the sumps and associated pipes were sampled and submitted for field screening and laboratory analysis of TCL/TAL analytes, boron, lithium, and explosives.

In addition to the sanitary sewer, acid sewer, and storm sewer lines, two adjacent TNT wastewater lines exist in the nitration area of the former LOOW. These lines have been characterized during previous investigations and are currently included in a removal action. Therefore the lines were not included in the Phase I investigation.

Because of the varied nature of the sampling programs, investigations of the sewer lines, sumps, and the 30-in. outfall line will be discussed separately.

11.1 SANITARY, ACID WASTE, AND STORM SEWER LINES

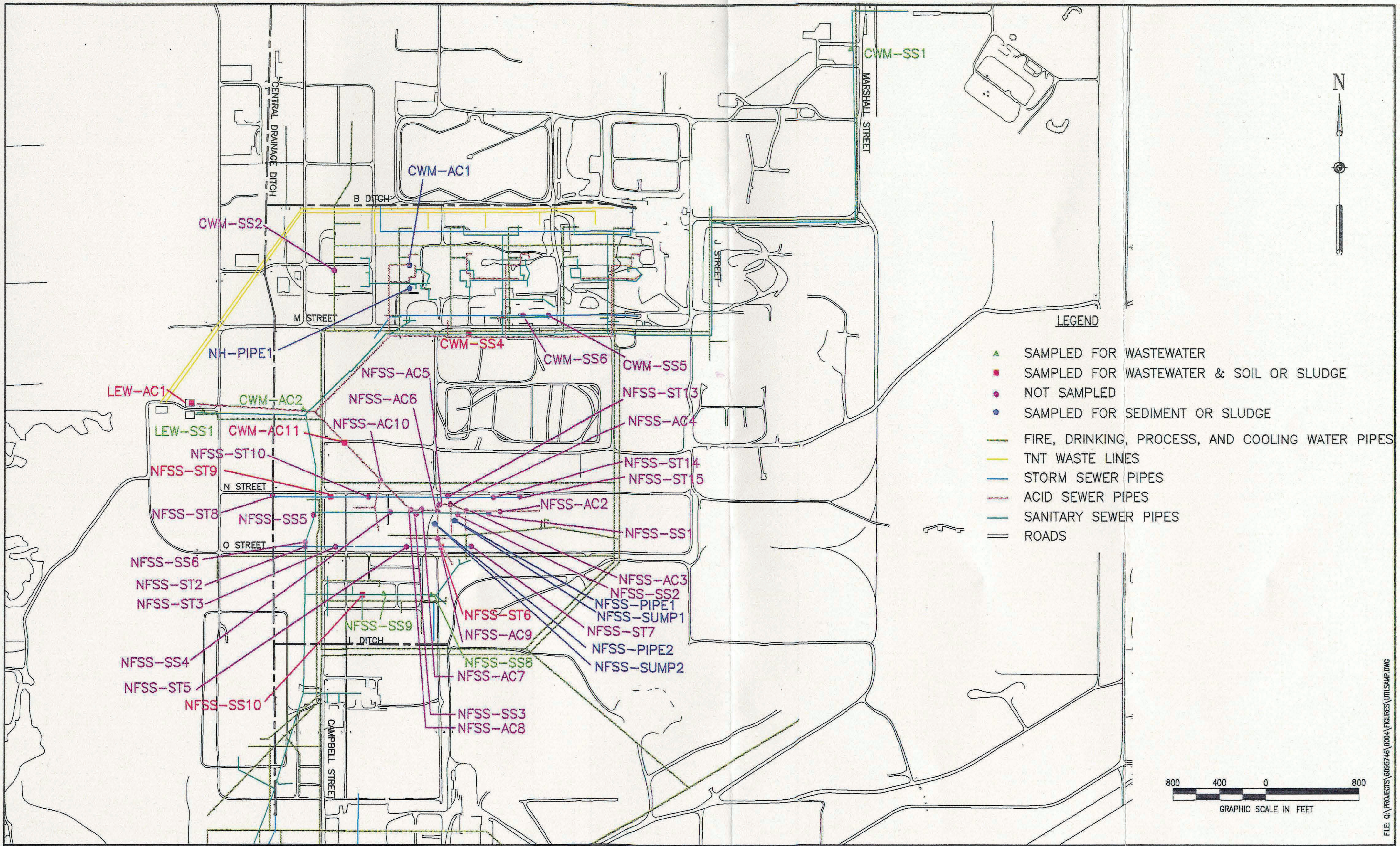
11.1.1 Site Background

11.1.1.1 Sanitary Sewer Lines

The main sanitary sewer lines of the former LOOW trended east to west and ran along the southern sides of J Street and M Street and centrally between N Street and O Street. Other north-south trending lines ran along the west sides of Marshall Street, and Campbell Street, and on the eastern side of a portion of MacArthur Street. The Campbell Street sewer main and the M Street sewer mains eventually received the wastes from the entire plant and joined at a manhole due east of the WWTP. Although this manhole was not located during the field reconnaissance, it would have been in the vicinity of manhole CWM-AC2 (Figure 11-1). A single sanitary sewer line entered the eastern side of the WWTP pumping station from this manhole. These lines also carried waste from AFP-38, the Navy Interim Pilot Production Plant (IPPP), and the NIKE Base. It is likely that the lines also received waste from the Boron-10 plant, AEC storage areas, and the NECW; however, evidence of line tie-ins has not been located. The former sanitary sewer lines are located on property currently owned by CWM, NFSS, Modern Disposal Inc., and the Town of Lewiston.

11.1.1.2 Acid Waste Sewer Lines

There were two main branches to the acid waste sewer lines at the former LOOW. The southern branch received waste from the acid production and concentration areas between O Street and N Street (currently NFSS property). The main waste line from this area crossed N Street trending to the northwest (J.G. White 1942). It terminated in a manhole west of Campbell Street (manhole CWM AC-2 on Figure 11-1). The second main acid waste line received waste from the laboratories and nitrating houses north of M Street. Three branches from the nitrating houses traveled south to an acid waste line trending east to west just south of M Street (currently CWM property). Between the last two TNT production lines, the acid waste sewer turned southwest and terminated at the manhole described above. From this manhole a single acid waste line entered the north end of the acid neutralization building at the wastewater treatment plant (J.G. White 1942). Investigations performed to date on CWM property indicate that the acid waste sewer lines were concrete-encased. Investigations of the acid waste sewers on NFSS have not



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	BASEWIDE RI/FS LAKE ONTARIO ORDNANCE WORKS NIAGARA COUNTY, NEW YORK	COMPONENT 7 (LOOW UTILITIES) FORMER UNDERGROUND LOOW UTILITIES SAMPLING POINT LOCATIONS	DESIGNED BY –	DRAWN BY WCM	DATE JULY 1999	PROJECT NO. 60957.46	FILE NAME UTILSAMP
			CHECKED BY KME	PROJECT MGR. HGP	SCALE AS SHOWN	DRAWING NO. –	FIGURE 11-1

been performed to date. However, it is known that several portions of the lines, particularly on CWM property, have been plugged.

11.1.1.2 Storm Sewer Lines

The underground storm water lines installed at the former LOOW discharge into several surface water drainage systems (J. G. White 1942). The main underground storm sewers trended east to west. Based on interpretation of available site maps, the most northern underground storm sewer trended east to west and ran just south of the former TNT wash houses. This line turned to the north between the fifth and sixth TNT production lines and discharged into B Ditch. A second storm sewer trends east to west approximately 100 ft north of M Street. This storm sewer turned to the southwest just east of the fifth TNT production line and discharged into former LOOW H Ditch. These two northernmost lines are located on property currently owned by CWM and the ditches are still present.

A third former LOOW storm sewer line was located approximately 40 ft south of N Street, trended east to west, and discharged directly into the Central Drainage Ditch. A fourth storm sewer was located just north of O Street and also discharged directly into the Central Drainage Ditch. A fifth storm sewer line trended north-south along the east side of the former LOOW shop area and discharged into L Ditch. These three storm sewer lines are on located on property currently occupied by the NFSS. The Central Drainage Ditch, as well as some of the secondary drainage ditches, was excavated during remedial activities by the DOE to remove radioactive sediment. Some of the concrete storm sewer outfalls to the ditches were removed, plugged, or otherwise altered during those activities.

Additional underground storm sewer lines were located in the former LOOW administration area. These discharge directly into the head of the Central Drainage Ditch. Modern Disposal Services, Inc currently owns this area. Interpretation of aerial photographs from 1997 suggests that the area has been excavated.

11.1.2 Field Reconnaissance and Surface Features

Manholes and/or storm drains were located using available site maps and/or inductive magnetometry (Figure 11-1). Most of the manholes referenced on available site maps as being within Component 5 and Component 3 were found. However, most of the former LOOW manholes associated with the sanitary sewer lines, storm water, and acid waste lines on Component 1 have been plugged, removed, or covered by landfills, lagoons, or berms. Two manholes located just north of the buildings on M Street were identified by CWM personnel as being former LOOW manholes (manholes CWM-SS5 and CWM-SS6 on Figure 11-1). These manholes had been welded shut. According to available site maps, these correspond to former LOOW sanitary sewer lines.

Acid waste and sanitary sewer manholes were observed to be brick-lined with a round steel cover. However, several manholes, particularly on Component 5, were found to be partially caved-in with missing covers. Many were filled with what appeared to be surface soil from the cave in. Only those manholes that were not caved in or did not appear to have only surface soil within them were chosen for sampling. This decreased the number of manhole eligible for sampling. Most of the storm water "manholes" were found to be open steel grates, for storm water run-off. Table 11.1-1 details the manholes that were located, the component number where located, the type of manhole, and whether or not the subsurface feature contained water and/or sludge/sediment and whether it was sampled.

11.1.3 Sludge Sampling Program

Confirmation of the presence of sediment in manholes was established by visual observation during reconnaissance. In cases where water impeded the ability to see the bottom of the manhole, it was assumed that sediment was present, and sediment sampling was attempted after collection of a wastewater sample. A total of 7 sediment/sludge samples were collected from acid, storm water, and sanitary sewer lines.

Within Component 1, a total of four sludge samples were collected, one from a sanitary sewer manhole, two from acid waste sewer manholes, and one from a presumably acid waste pipe discovered during an excavation within the nitration houses.

One sludge sample was collected from Component 3, from an acid waste manhole.

Within Component 5, a total of seven sludge samples were collected. Four of the seven were associated with the sumps discovered in the acid concentration area and are discussed in Section 11.3. Of the remaining three samples, two were collected from storm water manholes and one was collected from a sanitary sewer manhole.

With the exception of the sample collected from the pipe exposed during excavation at the former LOOW nitration houses (C1-NH-SL-PIPE1) and an acid sewer manhole 11 (AC11), the sediment/sludge samples collected within Component 1 were analyzed for DOD marker

TABLE 11.1-1 SUMMARY OF LOCATED FORMER LOOW UTILITY MANHOLES

Component Number	Type	Manhole Number	Water Present?	Sediment Present?	Sample Collected?
1 CWM	SS	1	Yes	No	Yes (WW)
1 (8) (CWM)	SS	2	No	No	No
1 (CWM)	SS	4	Yes	Yes	Yes (SL,WW)
1 (CWM)	SS	5	Sealed	Sealed	No
1 (CWM)	SS	6	Sealed	Sealed	No
1 (CWM)	AC	1	No	Yes	Yes (SL)
1 (CWM)	AC	2	Yes	NC	Yes (WW)
1 (CWM)	AC	11	Yes	Trace	Yes (SL,WW)
1 (CWM)	Pipe	1	No	Yes	Yes (SL)
3 (LEW)	AC	1	Yes	Yes	Yes (SL,WW)
3 (LEW)	SS	1	Yes	No	Yes (WW)
5 (NFSS)	AC	2	No	No	No
5 (NFSS)	AC	3	No	No	No
5 (NFSS)	AC	4	Trace	No	No
5 (NFSS)	AC	5	No	No	No
5 (NFSS)	AC	6	Trace	No	No
5 (NFSS)	AC	7	Trace	No	No
5 (NFSS)	AC	8	No	No	No
5 (NFSS)	AC	10	No	No	No
5 (NFSS)	SS	1	Trace	No	No
5 (NFSS)	SS	2	Trace	Trace	No
5 (NFSS)	SS	3	Trace	Trace	No
5 (NFSS)	SS	4	No	No	No
5 (NFSS)	SS	5	No	No	No
5 (NFSS)	SS	6	No	Trace	No
5 (NFSS)	SS	8	Yes	No	Yes (WW)
5 (NFSS)	SS	9	Yes	No	Yes (WW)
5 (NFSS)	SS	10	Yes	Yes	Yes (SL,WW)
5 (NFSS)	ST	3	No	No	No
5 (NFSS)	ST	5	No	Trace	No
5 (NFSS)	ST	6	Yes	Yes	Yes (SL,WW)
5 (NFSS)	ST	7	No	No	No
5 (NFSS)	ST	8	No	No	No
5 (NFSS)	ST	9	Yes	Yes	Yes (SL,WW)
5 (NFSS)	ST	10	No	No	No
5 (NFSS)	ST	13	No	No	No
5 (NFSS)	ST	14	No	No	No
5 (NFSS)	ST	15	No	No	No

AC = acid waste sewer, SS = sanitary sewer, ST = storm sewer, Sealed = manhole was welded closed. NC = sediment not checked due to carcass in manhole.

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compounds only. The remaining sediment/sludge samples collected from underground utilities were analyzed for full TCL/TAL analytes, boron, lithium, and explosives. The sample collected from Component 3 was field screened, but inadvertently not submitted for laboratory analysis. A subset of sludge samples were submitted for grain size analysis for future risk assessment use. As such, the results of the grain size analysis are provided in Appendix D, but are not discussed herein.

11.1.4 Sludge Screening Results

Due to the age of the underground lines there is a potential for the lines to be deteriorated. As such, COPC within the lines has the potential to impact the subsurface soil in the vicinity of the lines. In addition, it is currently unknown if all of the lines leading into the former WWTP have been plugged. If the lines have not been plugged, there is a potential for waste within the underground lines to leak from the 30-in outfall into the southwestern drainage ditch where the outfall line traverses across the drainage thereby impacting that drainage. Therefore, the sludge results have been compared to both sediment and soil screening criteria. COPC within the underground lines on Town of Lewiston property and NFSS have a higher possibility of impacting surface water/sediment than those on CWM where most of the manholes and lines have been removed or plugged.

Sludge-screening results are shown in Table 11.1-2. Concentrations of reported analytes that exceeded 1/10th of the soil screening criteria have been lightly shaded. Those concentrations exceeding the full value of the NY State soil comparison criteria have been darkly shaded. Note that the shading is in reference to the soil screening criteria only, and not the sediment screening criteria.

<u>Component 1 (CWM)</u>

Trace concentrations of VOCs were reported in two of the four samples. The reported concentrations did not exceed 1/10th of the NY State comparison criteria. PAHs were reported in each of the four samples collected underground utilities within Component 1. The reported concentrations exceeded 1/10th of the NY State comparison criteria for soil, but did not exceed the full value of the criteria. PCB were reported in two of the samples, NH-PIPE1 and CWM-SS4, at concentrations that exceeded the NY State comparison criteria for soil. The reported PCB concentration in the sample collected from CWM-AC1 exceeded 1/10th of the comparison criteria. Each of the reported PCB concentrations exceeded the sediment screening criteria.

TNT was also reported in the PIPE1 sludge sample, in concentrations that did not exceed the screening criteria.

Component 5 (NFSS)

Samples were collected from both the underground waste lines and the sumps discovered within the acid concentration area. Below is a discussion of the results of the sludge samples from the underground waste lines only. A discussion of the samples collected from the sumps is discussed in Section 11.3.

Trace concentrations of VOCs were reported in the sample collected from NFSS-SS10. The concentration did not exceed $1/10^{th}$ of the NY State comparison criteria. PAHs were reported in each of the three samples. The reported concentrations in the samples collected from NFSS-ST6 exceeded the NY State comparison criteria for soil. The PAH concentrations in samples collected from locations NFSS-SS10 and NFSS-ST9 exceeded $1/10^{th}$ of the soil comparison criteria. PCB and TNT were not reported in the sludge samples collected from the sanitary sewer and storm water lines within the NFSS.

Component 3 (Town of Lewiston)

VOCs, ranging up to 19.41 µg/kg o-xylene, were reported in the sludge sample collected from AC1. The reported concentrations did not exceed $1/10^{th}$ of the soil or sediment comparison criteria. PAHs and TNT were reported, but were below the screening criteria. However, the reported concentration of PAHs exceeded $1/10^{th}$ of the NY State soil comparison criteria. PCB were not reported.

11.1.5 Laboratory Analyses and Confirmatory Sampling Results

Laboratory analytical results are shown in Table 11.1-3. Analytes which exceed soil screening criteria have been shaded.

Component 1 (CWM)

Sludge samples collected from CWM-AC1 and CWM-SS4 were submitted for DOD marker compounds only. Boron and lithium were reported in both of the samples. Although a NY State comparison criteria does not exist for boron and lithium, the reported concentration of boron in the sample collected from location SS4 appeared to be elevated in comparison with boron concentrations reported in the other sludge samples collected during the Phase I investigation. Explosives were not reported.

Sludge samples collected from NH-PIPE1 and CWM-AC11 were submitted for full suite analysis. VOCs were not reported. SVOCs exceeded both the sediment and the soil screening criteria. Phenol and 4-methylphenol exceeded the NY State soil comparison criteria in the sludge sample collected from CWM-AC11. Each of the reported SVOCs in the sample collected from NH-PIPE1 exceeded the NY State sediment comparison criteria. The reported concentrations of hexachlorobenzene and bis(2-ethylhexyl)phthalate exceeded the NY Sate soil comparison criteria as well. PAHs were reported in both samples, with benzo[a]pyrene exceeding both the soil and sediment comparison criteria in AC11. Reported concentrations of benz[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, and chrysene exceeded the full value of the sediment comparison criteria and 1/10th of the NY State soil comparison criteria. PCBs were reported in AC11, exceeding the NY State sediment comparison criteria and 1/10th of the NY State soil comparison criteria. The presence of PCB within PIPE1 was not adequately evaluated due to the high detection limits reported for that sample. Pesticides were reported in the sludge samples collected from NH-PIPE1 and CWM-AC11 in concentrations that exceeded both sediment and soil screening criteria in PIPE1. Metals exceeded both the sediment and soil screening criteria in both PIPE1 and AC11. Cyanide was reported in AC11 but did not exceed criteria. Explosives were not reported.

Component 5 (NFSS)

VOCs were not reported in the three sludge samples from Component 5. However, it should be noted that an adequate evaluation for the presence of VOCs could not be made due to the high detection limits reported for the volatile organics analysis. The only SVOC reported was 4-methylphenol, reported in NFSS-ST9. The concentration exceeded the NY State soil comparison criteria in the duplicate collected from that location. PAHs exceeding 1/10th of the NY State comparison criteria were reported in each of the sludge samples. Concentrations of several PAHs exceeded the full value of the soil and sediment comparison criteria in the sample collected from NFSS-ST6. PCB were reported in NFSS-ST6 in concentrations that exceeded sediment comparison criteria and 1/10th of the NY State soil comparison criteria. Pesticides were reported in NFSS-ST6 and NFSS-ST9 but did not exceed criteria. Metals exceeded both the sediment and soil comparison criteria in each of the three sludge samples. Cyanide and explosives were not reported.

11.1.6 Wastewater Sampling and Results

Manholes that contained a sufficient amount of water were sampled for laboratory analysis. A total of 11 wastewater samples were collected. With the exception of the sample collected from AC11, which is not on the same main line as those manholes along M Street, wastewater samples collected within Component 1 and Component 3 were analyzed for DOD marker compounds. Wastewater samples collected within Components 5 were analyzed for TCL/TAL analytes, boron, lithium, and explosives.

As discussed in Section 11.1.4, a potential for impact to both ground-water and surface water exists for some of the sampling locations. Therefore, a comparison of the results to both ground-water and surface water screening criteria is included in the results discussion.

Laboratory analytical results for wastewater samples are shown in Table 11.1-4. Analytes that exceed soil screening criteria have been shaded.

Component 1 (CWM)

Wastewater samples were collected from four manholes: CWM-AC2, CWM-AC11, CWM-SS1 and CWM-SS4, on Component 1.

CWM-AC2, CWM-SS1, and CWM-SS4 were submitted for analysis of DOD marker compounds. Boron and lithium were reported in each of the three samples. Boron exceeded the NY State ground-water comparison criteria in SS4. The reported concentration of boron exceeded $1/10^{th}$ of the comparison criteria in the sample collected from CWM-AC2. The explosive RDX exceeded the NY State ground-water comparison criteria in the sample from AC2. The reported concentration of RDX in the sample collected from SS1 exceeded $1/10^{th}$ of the criteria.

The wastewater sample from AC11 was submitted for full suite analysis. VOCs were reported in concentrations that exceeded $1/10^{th}$ of the NY State ground-water comparison criteria. The SVOC bis(2-ethylhexyl)phthalate exceeded the full value of the NY State surface water comparison criteria and $1/10^{th}$ of the NY State ground-water comparison criteria in the wastewater sample collected from CWM-AC11. The PAH benzo[k]fluoranthene exceeded the ground-water screening criteria. PCB and pesticides were not reported in AC11. Several metals exceeded both the ground-water and surface water comparison criteria. The explosive 2,4-dinitrotoluene was reported but did not exceed criteria. Cyanide was not reported.

Component 5 (NFSS)

Toluene was reported in the duplicate sample collected from NFSS-ST9 in concentrations that exceeded 1/10th of the NY State ground-water and surface water comparison criteria. Bis(2-ethyl hexyl)phthalate exceeded the surface water comparison criteria in the duplicate of ST9 but not the original sample. The reported concentration of phenol exceeded the ground-water comparison criteria in the duplicate sample collected from NFSS-ST9 as well. A trace concentration of phenanthrene was reported in NFSS-SS8. Pesticides exceeded the NY State ground-water comparison criteria of 0 µg/L in NFSS-SS8, NFSS-ST6 and NFSS-ST9. Several metals exceeded both the NY State ground-water and surface water comparison criteria.

PCBs, explosives, cyanide, were not reported in the wastewater samples collected from Component 5.

Component 3 (Town of Lewiston Property)

The two wastewater samples collected from Component 3, LEW-AC1 and LEW-SS1, were analyzed for DOD marker compounds. Boron and lithium were reported in both samples. Boron exceeded the NY State ground-water comparison criteria in the sample from LEW-SS1. The reported concentration of boron in the wastewater sample collected from LEW-AC1 exceeded 1/10th of the NY State comparison criteria. Explosives were not reported.

11.2 30-INCH OUTFALL LINE

11.2.1 Site Background

The discharge from the former LOOW WWTP flowed into a 30-in. underground sewer line. This line exited to the west from the final mixing house of the WWTP. The line trends west-southwest approximately 9,000 ft to a point past Creek Road, after which it trends to the southwest. It traverses southwest for approximately 1,500-ft, after which the line turns to the west for approximately 4,000-ft, then southwest again for 1,000 ft to a manhole on the west side of Lower River Road where it ties into the current town of Lewiston sanitary sewer system (Figure 11-2). This outfall line accepted untreated TNT wastewater, acid-neutralized wastewater, and sanitary wastewater from the former LOOW. It also accepted waste from former AFP–68, Boron-10 plant, and NIKE base. Carborundum Metals Company also discharged thiocyanate into the former LOOW WWTP.

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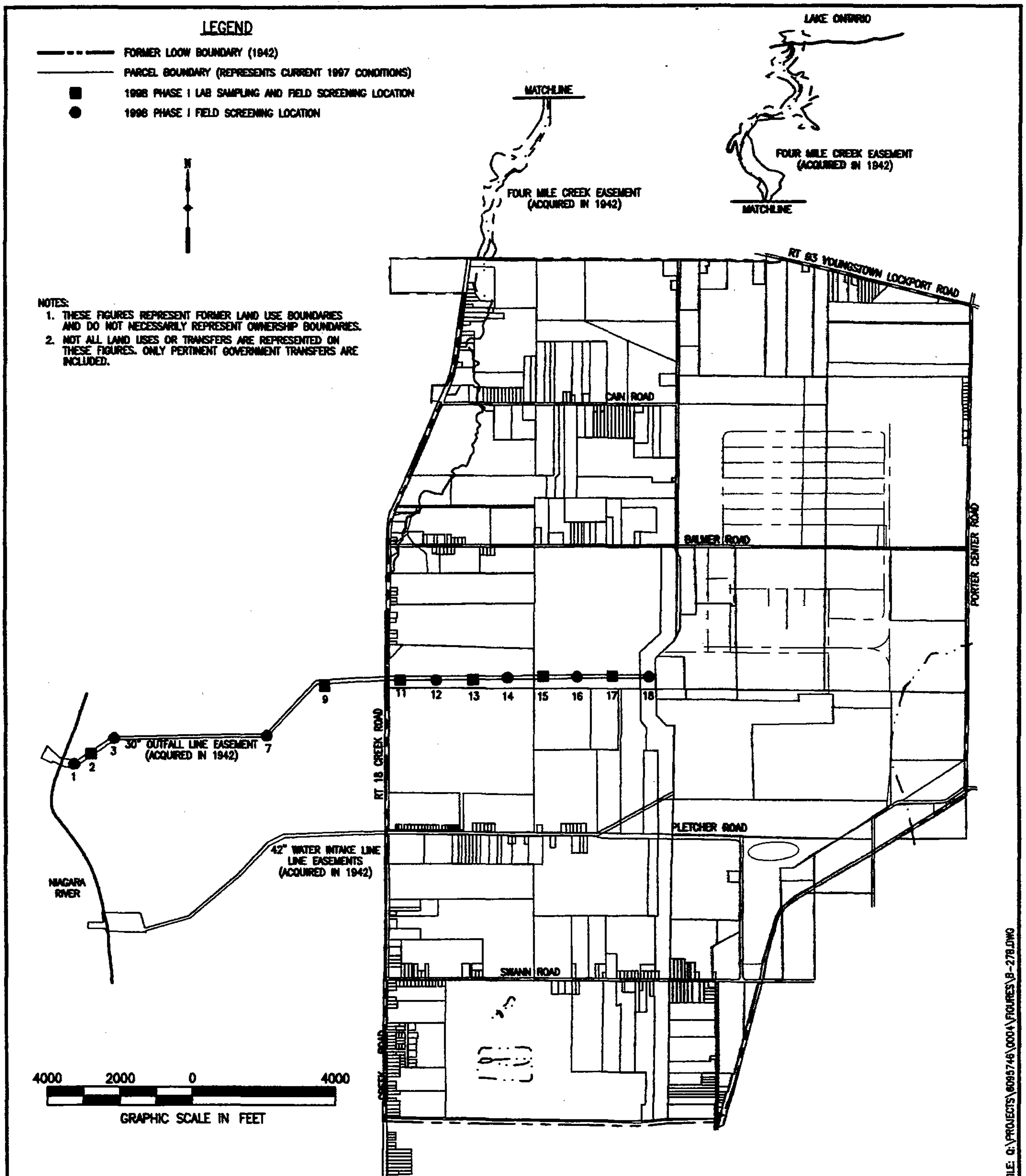

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

COMPONENT 7 (LOOW UTILITIES)
30-IN. OUTFALL LINE
SAMPLING POINT LOCATIONS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
HGP	BCR	WCM	SMS	AS SHOWN	MAY 1999	60957.46	11-2

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The town of Lewiston currently owns the 30-in. outfall line and associated easement on the ground surface. Prior to purchase by the town of Lewiston, the 30-in. outfall line flowed directly to the Niagara River.

11.2.2 Field Reconnaissance and Surface Features

An easement that ranges from 10 ft wide near the WWTP to 40 ft wide west of Creek Road follows the 30-in. outfall line on the ground surface from its source at the former LOOW WWTP to its termination at the Niagara River. From the former LOOW WWTP the 30-in. outfall traverses a heavily overgrown easement to a walleye/trout hatchery. It continues through the hatchery property and then traverses the Southwest drainage ditch where it is visible within the ditch. It continues underground across the property of the Lew-Port public school. The easement widens as it continues west through residential areas. The outfall line then traverses the Robert Moses State Parkway, then the Joseph Davis State Park to a manhole on the west side of River Road, where it ties into the town of Lewiston sanitary sewer system. Flow from this manhole to the former LOOW hydraulic head house is blocked by sand bags that have been placed within the manhole.

At its source at the WWTP, the 30-in. outfall lies approximately 4 to 5 ft bgs. As it travels further to the west, its depth gradually increases to approximately 14 to 16 ft bgs. Location 10 was not sampled due to the objections of a local resident. Also, locations 4, 5, 6, and 8 were not sampled due to property access clearance difficulties on Joseph Davis State Park.

11.2.3 Soil Sampling Program

During the Phase I RI, field activities at the 30-in. outfall line included collection of subsurface-soil samples. Eighteen proposed field-screening sample locations were established across the site from the pipeline's source at the WWTP to the termination at the Niagara River. Sample locations were given alpha-numeric designations as detailed in the SAPs. Due to property access issues, only thirteen of the eighteen locations were sampled (Figure 11–2).

Direct push technology was used to perform sampling at each sampling location. Subsurface soil samples were collected from the interval just below the bottom of the pipeline, as determined from plans provided by the Town of Lewiston. Sample depths ranged from 6 to18 ft bgs. Each subsurface-soil sample was field screened for TNT. Every other subsurface soil sample was submitted to the laboratory for analysis of DOD marker compounds as discussed in Sections 11.2.5 and 11.2.6.

11.2.4 Site Stratigraphy

11.2.4.1 Surface Soils

Surface-soils along the 30-in. outfall line were inspected and generally consisted of moderate brown, dry to moist, clayey silts, rich in organic matter (i.e., roots, grass, etc.). Surface soils were not sampled for field screening or laboratory analysis.

11.2.4.2 Subsurface Stratigraphy

Subsurface stratigraphy was generally characterized as mottled UCT with minor silt, fine sand, and/or gravel to depths ranging from 4 to 8 ft bgs. The target depth for field screening the deep sample coincided with the depth of the bottom of the 30-in. outfall pipe to assess possible releases from the pipe. Samples for confirmatory laboratory analysis were collected at every other location and submitted for DOD marker compound analysis.

The UCT unit was commonly found at depths of 4 to 16 ft bgs along the 30-in. outfall. This unit consisted of moderate brown, moist, firm, silty clay, with little gravel. The UST was found at location 12 at depths from 8 to 10 ft bgs, and was similarly described, with an increase in silt content. Little water was found in subsurface strata along the 30-in. outfall, in comparison to other areas of the former LOOW.

11.2.5 Soil Screening Results

Soil samples were field screened for TNT. TNT was not reported in samples.

11.2.6 Laboratory Analyses and Confirmatory Sampling Results

Laboratory analytical results can be found in Table 11.2-1. Soil samples were submitted to the laboratory for analysis of boron, lithium, and explosives. Lithium and boron were reported, but at levels below screening criteria.

11.2.7 Ground-Water Sampling and Results

A ground-water producing zone was not encountered during direct push soil sampling. Therefore, a ground-water sample was not collected from the 30-in. outfall area.

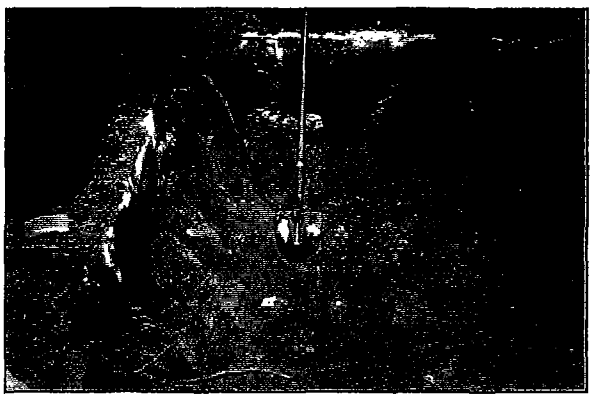
11.3 ACID CONCENTRATION AREA SUMPS

Photograph 11.3-1 One of several sumps located in the former Acid Concentration Area within NFSS.

11.3.1 Site Background

Several surface artifacts that appeared to be sumps were located in the former Acid Concentration Area during site reconnaissance (Photograph 11.3-1). The past use of the sumps is unknown, but they appear to be associated with the acid concentration cooling system.

11.3.2 Field Reconnaissance and Surface Features



Photograph 11.3-2 Picture of excavated sump showing exposed 12-in. o.d. terra cotta pipe extending from the bottom of the sump. The sump is the concrete structure on the left.

The sumps were observed to be constructed of brick and mortar framed on the surface with concrete, with buried, 12-in. o.d. terra cotta pipes that extend vertically down approximately 3 ft bgs to a 90-degree elbow. The pipe extends from the elbow out laterally, through the bottom of the sump (Photo 11.3-2). The full length of the underground line was not excavated, therefore it is unknown where these pipes lead. It is assumed that they lead to the acid waste sewer lines. Many of the sumps currently contain detritus and debris.

11.3.3 Sludge Sampling Program

Two representative sumps and associated pipes were excavated during the Phase I RI. The pipes did not contain liquid. The sludge within the pipe was largely comprised of detritus. One grab sample of sludge within the sump (SL-SUMP1 and 2) and one grab sample of sludge within the terra cotta pipe (SL-PIPE1 and 2) were collected from each excavated sump. After sampling, the sumps were back-filled.

Samples were field-screened and submitted to the laboratory for analysis of full suite TCL/TAL analytes, boron, lithium, and explosives.

11.3.4 Sludge Screening Results

As discussed in Section 11.1.4, a potential for impact to both soil and sediment may exist for some of the sampling locations. Therefore, a comparison of the results to both soil and sediment screening criteria is included in the results discussion.

Trace VOCs were reported but did not exceed 1/10th of the NY State soil comparison criteria. PAHs were reported in each of the sludge. Reported PAH concentrations exceeded the full value of the soil comparison criteria in the samples collected from PIPE2 and SUMP1. PAH concentrations exceeded 1/10th of the criteria in the sludge samples collected from PIPE1 and SUMP2. PCB were reported in the sludge samples collected from PIPE1, SUMP1, and SUMP2 in concentrations that exceeded the sediment comparison criteria and 1/10th of the soil criteria. The PCB concentration reported in SUMP1 also exceeded the full value of the NY State soil comparison criteria. TNT was reported in SUMP1 but did not exceed criteria. Sludge-screening results can be found in Table 11.1-2.

11.3.5 Laboratory Analyses and Confirmatory Sampling Results

Laboratory analytical results can be found in Table 11.1-3. Analytes that exceed screening criteria have been shaded.

Acetone and methylene chloride exceeded the NY State soil comparison criteria in the sample submitted from PIPE2. Acetone also exceeded soil screening criteria in SUMP2. An adequate evaluation of all VOCs could not be made due to the high detection limit. The SVOC bis(2-ethyl hexyl)phthalate was reported in the sludge sample collected from SUMP2 but the concentration did not exceed 1/10th of the soil comparison criteria. PAHs exceeded the NY State soil and

Table 11.1-2 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Sludge (Field-Screening Results)

METHOD	ANALYTE	UNIT	SOIL ACTION LEVEL	SOIL ACTION LEVEL TYPE	SEDIMENT ACTION LEVEL	SEDIMENT ACTION LEVEL TYPE	C1-NH-SL-PIPE1-REP	C7-CWM-SL-AC1-DUP	C7-CWM-SL-AC1-REP	C7-CWM-SL-AC11-REP	C7-CWM-SL-SS4-REP	C7-LEW-SL-AC1	C7-NFSS-SL-PIPE1	C7-NFSS-SL-PIPE2	C7-NFSS-SL-SS10	C7-NFSS-SL-ST6
E4020	PCB	UG/KG	1000	NYTAGM	0.028	NYBIOACCUM	49640	220	320		3160		260			
E4035	PAH	UG/KG	10000	NYTAGM			8382	2598	2522	8337	3508	6315	8610	12439	6238	14847
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE			2810					90				
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM			1.4	NA				1.21				
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM				NA				11.04				
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM				NA				15.52			3.58	
GC	M & P-XYLENES	UG/KG	1200	NYTAGM			1.5	NA				15.71				
GC	O-XYLENE	UG/KG	1200	NYTAGM			1.4	NA				19.41				
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	28	NYBIOACCUM		NA		1.38			2.08	1.33		
GC	TOLUENE	UG/KG	1500	NYTAGM			1	NA				5.39			2.13	
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM				NA				12				
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	70	NYBIOACCUM	2.5	NA				1.42				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 11.1-2 *Component 7, Former Underground LOOW Utilities,* Summary of Detected Analytes in Sludge (Field-Screening Results)

METHOD	ANALYTE	UNIT	SOIL ACTION LEVEL	SOIL ACTION LEVEL TYPE	SEDIMENT ACTION LEVEL	SEDIMENT ACTION LEVEL TYPE	C7-NFSS-SL-ST6-DUP	C7-NFSS-SL-ST9	C7-NFSS-SL-SUMP1	C7-NFSS-SL-SUMP2
E4020	PCB	UG/KG	1000	NYTAGM	0.028	NYBIOACCUM	NA		1040	220
E4035	PAH	UG/KG	10000	NYTAGM			NA	1131	16980	8222
E4050	2,4,6-TRINITROTOLUENE	UG/KG	40000	NYGUIDANCE			NA		250	
GC	1,1,1-TRICHLOROETHANE	UG/KG	800	NYTAGM						
GC	CIS-1,2-DICHLOROETHENE	UG/KG	250	NYTAGM						
GC	ETHYLBENZENE	UG/KG	5500	NYTAGM						
GC	M & P-XYLENES	UG/KG	1200	NYTAGM						
GC	O-XYLENE	UG/KG	1200	NYTAGM						
GC	TETRACHLOROETHENE	UG/KG	1400	NYTAGM	28	NYBIOACCUM			1.01	
GC	TOLUENE	UG/KG	1500	NYTAGM						
GC	TRANS-1,2-DICHLOROETHENE	UG/KG	300	NYTAGM						
GC	TRICHLOROETHYLENE	UG/KG	700	NYTAGM	70	NYBIOACCUM				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = n[illegible]alyzed

blank = [illegible]tected

Table 11.1-3 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Sludge (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	SOIL ACTION LEVEL	SOIL ACTION LEVEL TYPE	SEDIMENT ACTION LEVEL	SEDIMENT ACTION LEVEL TYPE	C1-NH-SL-PIPE1-REP	C7-CWM-SL-AC1-REP	C7-CWM-SL-AC11-REP	C7-CWM-SL-SS4-REP	C7-NFSS-SL-PIPE1
E160.3	PERCENT MOISTURE	%					48.7	NA	56.7	NA	70.3
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US			11300	NA	13800	NA	4770
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	2	NY LOWEST	1.5 N	NA	1 N	NA	0.68 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	6	NY LOWEST	14.2	NA	4.8	NA	1.2 B
SW6010	BARIUM	MG/KG	300	NYTAGM			123	NA	154 E	NA	110 E
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG			0.42 B	NA	0.63	NA	
SW6010	BORON	MG/KG					21.8	11.2	23.9	53.9	
SW6010	CADMIUM	MG/KG	10	NYTAGM	0.6	NY LOWEST		NA		NA	
SW6010	CALCIUM	MG/KG					22100	NA	124000	NA	3370
SW6010	CHROMIUM	MG/KG	50	NYTAGM	26	NY LOWEST	68.7	NA	30.7 E	NA	8 N
SW6010	COBALT	MG/KG	30	NYTAGM			13.4	NA	8.8	NA	
SW6010	COPPER	MG/KG	50	NYTAGM-BG	16	NY LOWEST	403	NA	52.5	NA	49.2
SW6010	IRON	MG/KG	2000	NYTAGM	20000	NY LOWEST	47400	NA	25900	NA	19500
SW6010	LEAD	MG/KG	400	NYTAGM	31	NY LOWEST	26.2 *	NA	352 E	NA	104
SW6010	LITHIUM	MG/KG					20.5	13.3	23.7	22.6	
SW6010	MAGNESIUM	MG/KG					5940 N	NA	22100	NA	256 B
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	460	NY LOWEST	1930	NA	2600	NA	24.1
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	16	NY LOWEST	36	NA	22.3 N	NA	2.8 B
SW6010	POTASSIUM	MG/KG					1580	NA	2070 *	NA	699
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG			4.5	NA	1.8	NA	2.7
SW6010	SILVER	MG/KG	4.9	NYTAGM-BG	1	NY LOWEST		NA	0.14 B	NA	
SW6010	SODIUM	MG/KG					347	NA	387	NA	298 B
SW6010	VANADIUM	MG/KG	150	NYTAGM			21.4 E	NA	21.6	NA	1.4 B
SW6010	ZINC	MG/KG	76	NYTAGM-BG	120	NY LOWEST	269 N	NA	864 E	NA	19.7 N
SW7470	MERCURY	MG/KG	0.1	NYTAGM	0.15	NY LOWEST	0.13 B	NA	0.54	NA	1.2 B
SW7471	MERCURY	MG/KG	0.1	NYTAGM	0.15	NY LOWEST	NA	NA	NA	NA	NA
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG				NA		NA	0.4 B

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 11.1-3 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Sludge (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	SOIL ACTION LEVEL	SOIL ACTION LEVEL TYPE	SEDIMENT ACTION LEVEL	SEDIMENT ACTION LEVEL TYPE	C1-NH-SL-PIPE1-REP	C7-CWM-SL-AC1-REP	C7-CWM-SL-AC11-REP	C7-CWM-SL-SS4-REP	C7-NFSS-SL-PIPE1
SW8081	4,4'-DDD	UG/KG	2900	NYTAGM	0.35	NYBIOACCUM	14000 P	NA		NA	17 P
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM	0.35	NYBIOACCUM	38000	NA	4.3 P	NA	18 P
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM	0.35	NYBIOACCUM	19000 P	NA	1 P	NA	54 P
SW8081	ALDRIN	UG/KG	41	NYTAGM	3.5	NYBIOACCUM	69000 EP	NA	0.95	NA	
SW8081	ALPHA-BHC	UG/KG	110	NYTAGM				NA		NA	2.1 P
SW8081	ALPHA-CHLORDANE	UG/KG	540	NYTAGM				NA	13 P	NA	63 P
SW8081	BETA-BHC	UG/KG	200	NYTAGM				NA	0.99 P	NA	
SW8081	DELTA-BHC	UG/KG	300	NYTAGM			87000 EP	NA		NA	3.9 P
SW8081	DIELDRIN	UG/KG	44	NYTAGM	3.5	NYBIOACCUM	7900 P	NA	19	NA	130
SW8081	ENDOSULFAN I	UG/KG	900	NYTAGM	1.05	NYCHRONIC	7500 P	NA	12 P	NA	
SW8081	ENDOSULFAN II	UG/KG	900	NYTAGM				NA	12 P	NA	
SW8081	ENDOSULFAN SULFATE	UG/KG	1000	NYTAGM			16000 P	NA		NA	
SW8081	ENDRIN	UG/KG	100	NYTAGM	28	NYBIOACCUM	27000 P	NA		NA	
SW8081	ENDRIN ALDEHYDE	UG/KG					27000 P	NA		NA	19 P
SW8081	ENDRIN KETONE	UG/KG						NA		NA	
SW8081	GAMMA-BHC	UG/KG	60	NYTAGM				NA		NA	
SW8081	GAMMA-CHLORDANE	UG/KG	540	NYTAGM			35000	NA		NA	
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	0.028	NYBIOACCUM		NA		NA	1.5 P
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM			7900 P	NA	5.3 P	NA	5.5 P
SW8081	METHOXYCHLOR	UG/KG					34000	NA		NA	
SW8082	AROCLOR 1248	UG/KG	1000	NYTAGM	0.028	NYBIOACCUM		NA		NA	
SW8082	AROCLOR 1260	UG/KG	1000	NYTAGM	0.028	NYBIOACCUM		NA	200 P	NA	
SW8151	PENTACHLOROPHENOL	UG/KG	1000	NYTAGM	1400	NYCHRONIC	49000 P	NA		NA	
SW8260B	ACETONE	UG/KG	200	NYTAGM				NA		NA	
SW8260B	METHYLENE CHLORIDE	UG/KG	100	NYTAGM				NA		NA	
SW8270C	1,2,4-TRICHLOROBENZENE	UG/KG	3400	NYTAGM			1300	NA		NA	
SW8270C	4-METHYLPHENOL	UG/KG	900	NYTAGM				NA	8400	NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

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Table 11.1-3 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Sludge (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	SOIL ACTION LEVEL	SOIL ACTION LEVEL TYPE	SEDIMENT ACTION LEVEL	SEDIMENT ACTION LEVEL TYPE	C1-NH-SL-PIPE1-REP	C7-CWM-SL-AC1-REP	C7-CWM-SL-AC11-REP	C7-CWM-SL-SS4-REP	C7-NFSS-SL-PIPE1
SW8270C	BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	50000	NYTAGM	6982	NYCHRONIC	68000 D	NA		NA	
SW8270C	HEXACHLORO-1,3-BUTADIENE	UG/KG			10.5	NYBIOACCUM	23000 D	NA		NA	
SW8270C	HEXACHLOROBENZENE	UG/KG	410	NYTAGM	5.25	NYBIOACCUM	290000 D	NA		NA	
SW8270C	HEXACHLOROCYCLOPENTADIENE	UG/KG			154	NYCHRONIC	470000 D	NA		NA	
SW8270C	HEXACHLOROETHANE	UG/KG					3600	NA		NA	
SW8270C	PHENOL	UG/KG	30	NYTAGM				NA	640	NA	
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM	4900	NYCHRONIC		NA	560	NA	880
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM				NA	65	NA	55
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM	45.5	NYBIOACCUM	120	NA	91	NA	130
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM	45.5	NYBIOACCUM		NA	100	NA	210
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	45.5	NYBIOACCUM	70	NA	140	NA	240
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM			99	NA	79	NA	160
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	45.5	NYBIOACCUM	47	NA	64	NA	88
SW8310	CHRYSENE	UG/KG	400	NYTAGM	45.5	NYBIOACCUM	170	NA	72	NA	130
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM				NA	11	NA	21
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	35700	NYCHRONIC	35	NA	250	NA	360
SW8310	FLUORENE	UG/KG	50000	NYTAGM				NA	280	NA	90
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM	45.5	NYBIOACCUM	61	NA	50	NA	73
SW8310	NAPHTHALENE	UG/KG	13000	NYTAGM				NA		NA	310
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	4200	NYCHRONIC		NA	150	NA	210
SW8310	PYRENE	UG/KG	50000	NYTAGM			120	NA	180	NA	240
SW9012	CYANIDE	MG/KG						NA	0.45	NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 11.1-3 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Sludge (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	SOIL ACTION LEVEL	SOIL ACTION LEVEL TYPE	SEDIMENT ACTION LEVEL	C7-NFSS-SL-PIPE2	C7-NFSS-SL-SS10	C7-NFSS-SL-ST6	C7-NFSS-SL-ST9	C7-NFSS-SL-ST9-DUP	C7-NFSS-SL-SUMP1	C7-NFSS-SL-SUMP2
E160.3	PERCENT MOISTURE	%				69	51.8	63	27.8	34.1	60.1	46.4
SW6010	ALUMINUM	MG/KG	33000	NYTAGM-US		3870	1440	9880	13700	14700	313	690
SW6010	ANTIMONY	MG/KG	0.6	NYTAGM-B	2	0.98 BN	1.3 N	1.2 BN	1.1 N	1.9 N	1.6 BN	0.96 BN
SW6010	ARSENIC	MG/KG	34	NYTAGM-BG	6	7.1	3.4	2.2 B	3.9	2.7	0.84 B	4.6
SW6010	BARIUM	MG/KG	300	NYTAGM		164 E	134	141	115	143	268 E	91.8 E
SW6010	BERYLLIUM	MG/KG	1.4	NYTAGM-BG			0.49 B	0.4 B	0.85	0.61 B		
SW6010	BORON	MG/KG				9.1 B	7.1 B	5.6 B	7 B	7.1 B		
SW6010	CADMIUM	MG/KG	10	NYTAGM	0.6			1.3				
SW6010	CALCIUM	MG/KG				6560	2820	18000	72400	44200	530	832
SW6010	CHROMIUM	MG/KG	50	NYTAGM	26	8 N	75.6	27.3	47	119	3.6 N	6.2 N
SW6010	COBALT	MG/KG	30	NYTAGM			13.6	9.2 B	12.3	12.8		
SW6010	COPPER	MG/KG	50	NYTAGM-BG	16	24.5	47	184	39.6	71.9	11.3	20.3
SW6010	IRON	MG/KG	2000	NYTAGM	20000	15400	2980	28000	38500	38100	4030	20500
SW6010	LEAD	MG/KG	400	NYTAGM	31	132	27.9 *	50.4 *	46.6 *	36.6 *	43.9	258
SW6010	LITHIUM	MG/KG				6.7	27	18.1	22.2	29.1		
SW6010	MAGNESIUM	MG/KG				1700	928	7250	13300	11800	71.3 B	207
SW6010	MANGANESE	MG/KG	5000	NYTAGM-US	460	237	516	316	1290	971	6.8	35.5
SW6010	NICKEL	MG/KG	29	NYTAGM-BG	16	8.1 B	33.9	26.3	19.8	28.5	2.8 B	3.8 B
SW6010	POTASSIUM	MG/KG				1140	2110	1300	1370	1990	304 B	523
SW6010	SELENIUM	MG/KG	2.2	NYTAGM-BG		2.1	2.2	4.6	2.5	2.9	2.4	0.83 B
SW6010	SILVER	MG/KG	4.9	NYTAGM-BG	1				1.1 B		0.33 B	
SW6010	SODIUM	MG/KG				209 B	1920	234	453	561	316 B	199
SW6010	VANADIUM	MG/KG	150	NYTAGM		11 B	28.7 E	23.7 E	25.2 E	34.4 E		7.7 B
SW6010	ZINC	MG/KG	76	NYTAGM-BG	120	20.9 N	161 N	229 N	76.1 N	124 N	7.1 N	19.3 N
SW7470	MERCURY	MG/KG	0.1	NYTAGM	0.15	0.99 B	NA	0.45 B	0.08 B	0.15 B	0.99 B	0.56 B
SW7471	MERCURY	MG/KG	0.1	NYTAGM	0.15	NA	0.13 B	NA	NA	NA	NA	NA
SW7841	THALLIUM	MG/KG	0.5	NYTAGM-BG								

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = n[illegible]lyzed

blank = [illegible]tected

Table 11.1-3 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Sludge (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	SOIL ACTION LEVEL	SOIL ACTION LEVEL TYPE	SEDIMENT ACTION LEVEL	C7-NFSS-SL-PIPE2	C7-NFSS-SL-SS10	C7-NFSS-SL-ST6	C7-NFSS-SL-ST9	C7-NFSS-SL-ST9-DUP	C7-NFSS-SL-SUMP1	C7-NFSS-SL-SUMP2
SW8081	4,4'-DDD	UG/KG	2900	NYTAGM	0.35	24 P		2.3			100	6.3
SW8081	4,4'-DDE	UG/KG	2100	NYTAGM	0.35	29 P		8.5			38 P	11
SW8081	4,4'-DDT	UG/KG	2100	NYTAGM	0.35	52 P		10 P	1.8 P	6.7	390	48 P
SW8081	ALDRIN	UG/KG	41	NYTAGM	3.5						0.7	3.7 P
SW8081	ALPHA-BHC	UG/KG	110	NYTAGM							5.5 P	
SW8081	ALPHA-CHLORDANE	UG/KG	540	NYTAGM		180 P					2 P	
SW8081	BETA-BHC	UG/KG	200	NYTAGM							4.6 P	1 P
SW8081	DELTA-BHC	UG/KG	300	NYTAGM		6.5 P						0.95 P
SW8081	DIELDRIN	UG/KG	44	NYTAGM	3.5	420					4.1 JP	
SW8081	ENDOSULFAN I	UG/KG	900	NYTAGM	1.05						6.2 P	0.93 P
SW8081	ENDOSULFAN II	UG/KG	900	NYTAGM								
SW8081	ENDOSULFAN SULFATE	UG/KG	1000	NYTAGM							39 P	14 P
SW8081	ENDRIN	UG/KG	100	NYTAGM	28			8.9 P	1.3 P		0.96	
SW8081	ENDRIN ALDEHYDE	UG/KG				51 P		49	2.6 P	10	28 P	160
SW8081	ENDRIN KETONE	UG/KG						21		3.7	16 JP	80
SW8081	GAMMA-BHC	UG/KG	60	NYTAGM							3.7 P	
SW8081	GAMMA-CHLORDANE	UG/KG	540	NYTAGM								1.7 P
SW8081	HEPTACHLOR	UG/KG	100	NYTAGM	0.028	7.7 P					8.5 P	
SW8081	HEPTACHLOR EPOXIDE	UG/KG	20	NYTAGM		7.4 P		0.96			0.50	8.3 P
SW8081	METHOXYCHLOR	UG/KG										
SW8082	AROCLOR 1248	UG/KG	1000	NYTAGM	0.028						70	
SW8082	AROCLOR 1260	UG/KG	1000	NYTAGM	0.028			860		72 P	460	2200
SW8151	PENTACHLOROPHENOL	UG/KG	1000	NYTAGM	1400							
SW8260B	ACETONE	UG/KG	200	NYTAGM		4700 B						640 JB
SW8260B	METHYLENE CHLORIDE	UG/KG	100	NYTAGM		680 J						
SW8270C	1,2,4-TRICHLOROBENZENE	UG/KG	3400	NYTAGM								
SW8270C	4-METHYLPHENOL	UG/KG	900	NYTAGM				220	940			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.

NA = not analyzed

blank = not detected

Table 11.1-3 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Sludge (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	SOIL ACTION LEVEL	SOIL ACTION LEVEL TYPE	SEDIMENT ACTION LEVEL	C7-NFSS-SL-PIPE2	C7-NFSS-SL-SS10	C7-NFSS-SL-ST6	C7-NFSS-SL-ST9	C7-NFSS-SL-ST9-DUP	C7-NFSS-SL-SUMP1	C7-NFSS-SL-SUMP2
SW8270C	BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	50000	NYTAGM	6982							540
SW8270C	HEXACHLORO-1,3-BUTADIENE	UG/KG			10.5							
SW8270C	HEXACHLOROBENZENE	UG/KG	410	NYTAGM	5.25							
SW8270C	HEXACHLOROCYCLOPENTADIENE	UG/KG			154							
SW8270C	HEXACHLOROETHANE	UG/KG										
SW8270C	PHENOL	UG/KG	30	NYTAGM								
SW8310	ACENAPHTHENE	UG/KG	50000	NYTAGM	4900	51	36	1500	49	39	310	830
SW8310	ANTHRACENE	UG/KG	50000	NYTAGM		3.1	5.7	150	6.7	3.9	21	68
SW8310	BENZ[A]ANTHRACENE	UG/KG	224	NYTAGM	45.5	9.3	10	350	9.5	9	90	120
SW8310	BENZO[A]PYRENE	UG/KG	61	NYTAGM	45.5	18	15	440	15	15	110	250
SW8310	BENZO[B]FLUORANTHENE	UG/KG	224	NYTAGM	45.5	35	29	660	19	23	160	320
SW8310	BENZO[GHI]PERYLENE	UG/KG	50000	NYTAGM		16	17	340	21	15	100	180
SW8310	BENZO[K]FLUORANTHENE	UG/KG	224	NYTAGM	45.5	13	9.9	300	23	18	58	110
SW8310	CHRYSENE	UG/KG	400	NYTAGM	45.5	14	11	530	13	7.1	120	120
SW8310	DIBENZ[A,H]ANTHRACENE	UG/KG	14	NYTAGM			4	47				21
SW8310	FLUORANTHENE	UG/KG	50000	NYTAGM	35700	37	26	940	32	29	310	480
SW8310	FLUORENE	UG/KG	50000	NYTAGM			6.2	92	9.4	6.2		18
SW8310	INDENO[1,2,3-CD]PYRENE	UG/KG	3200	NYTAGM	45.5	7.4	8.5	220	6.8	7.7	54	87
SW8310	NAPHTHALENE	UG/KG	13000	NYTAGM				210				680
SW8310	PHENANTHRENE	UG/KG	50000	NYTAGM	4200	40	13	290	17	16	170	450
SW8310	PYRENE	UG/KG	50000	NYTAGM		24	20	770	24	24	210	360
SW9012	CYANIDE	MG/KG										

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 11.1-4 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Waste Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	GROUND-WATER ACTION LEVEL	GROUND-WATER ACTION LEVEL TYPE	SURFACE WATER ACTION LEVEL	SURFACE WATER ACTION LEVEL TYPE	C7-CWM-WW-AC11	C7-CWM-WW-AC2	C7-CWM-WW-SS1	C7-CWM-WW-SS4	C7-LEW-WW-AC1	C7-LEW-WW-SS1	C7-NFSS-WW-SS10	C7-NFSS-WW-SS8
SW6010	ALUMINUM	T	UG/L			100	NYSTANDARD	5920	NA	NA	NA	NA	NA	126 B	205
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	3	NYGUIDANCE	1.1 B	NA	NA	NA	NA	NA	1.9 B	3.3 B
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD	190	NYSTANDARD	4.1 B	NA	NA	NA	NA	NA		
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD			151 B	NA	NA	NA	NA	NA	67.1 B	57.1 B
SW6010	BORON	T	UG/L	1000	NYSTANDARD	10000	NYSTANDARD	436	796	85.5 B	2320	150	1010	67 B	80.1 B
SW6010	CALCIUM	T	UG/L					130000	NA	NA	NA	NA	NA	91000 E*	69600 E*
SW6010	CHROMIUM	T	UG/L	50	NYSTANDARD			6.5 B	NA	NA	NA	NA	NA		
SW6010	COPPER	T	UG/L	200	NYSTANDARD			10.3	NA	NA	NA	NA	NA	2.6 B	2.4 B
SW6010	IRON	T	UG/L	300	NYSTANDARD	300	NYSTANDARD	5930	NA	NA	NA	NA	NA	1830 E*	1210 E*
SW6010	LEAD	T	UG/L	25	NYSTANDARD			55.2 E	NA	NA	NA	NA	NA		1.3 B
SW6010	LITHIUM	T	UG/L					42.5	3.7 B	5.8 B	9.5 B	4.8 B	6.3 B	6.7 B	6.4 B
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD			112000	NA	NA	NA	NA	NA	18100 *	13800 *
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD			1700	NA	NA	NA	NA	NA	732 *	437 *
SW6010	POTASSIUM	T	UG/L					5800	NA	NA	NA	NA	NA	5060 *	5180 *
SW6010	SELENIUM	T	UG/L	10	NYSTANDARD	1	NYSTANDARD	3.8 B	NA	NA	NA	NA	NA		2.6 B
SW6010	SILVER	T	UG/L	50	NYSTANDARD	0.1	NYSTANDARD	1.3 B	NA	NA	NA	NA	NA		
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD			49100	NA	NA	NA	NA	NA	4210 *	4740 *
SW6010	VANADIUM	T	UG/L			14	NYSTANDARD	7.4 B	NA	NA	NA	NA	NA		
SW6010	ZINC	T	UG/L	300	NYSTANDARD	30	NYSTANDARD	150	NA	NA	NA	NA	NA		
SW7470	MERCURY	T	UG/L	2	NYSTANDARD	0.2	NYSTANDARD	0.15 B	NA	NA	NA	NA	NA		
SW8081	ALPHA-BHC	N	UG/L	0	NYSTANDARD				NA	NA	NA	NA	NA		
SW8081	GAMMA-BHC	N	UG/L	0	NYSTANDARD				NA	NA	NA	NA	NA		0.0076 P
SW8081	HEPTACHLOR EPOXIDE	N	UG/L	0	NYSTANDARD				NA	NA	NA	NA	NA		
SW8260B	1,1-DICHLOROETHANE	N	UG/L	5	NYSTANDARD			2	NA	NA	NA	NA	NA		
SW8260B	2-BUTANONE	N	UG/L	50	NYGUIDANCE			1	NA	NA	NA	NA	NA		
SW8260B	ACETONE	N	UG/L	50	NYGUIDANCE			4	NA	NA	NA	NA	NA		
SW8260B	TETRACHLOROETHENE	N	UG/L	5	NYSTANDARD	1	NYGUIDANCE	0.7	NA	NA	NA	NA	NA		

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 11.1-4 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Waste Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	GROUND-WATER ACTION LEVEL	GROUND-WATER ACTION LEVEL TYPE	SURFACE WATER ACTION LEVEL	SURFACE WATER ACTION LEVEL TYPE	C7-CWM-WW-AC11	C7-CWM-WW-AC2	C7-CWM-WW-SS1	C7-CWM-WW-SS4	C7-LEW-WW-AC1	C7-LEW-WW-SS1	C7-NFSS-WW-SS10	C7-NFSS-WW-SS8
SW8260B	TOLUENE	N	UG/L	5	NYSTANDARD	5	NYGUIDANCE		NA	NA	NA	NA	NA		
SW8260B	TRICHLOROETHYLENE	N	UG/L	5	NYSTANDARD	11	NYGUIDANCE	0.3 J	NA	NA	NA	NA	NA		
SW8270C	4-METHYLPHENOL	N	UG/L						NA	NA	NA	NA	NA		
SW8270C	BIS(2-ETHYLHEXYL) PHTHALAT	N	UG/L	50	NYSTANDARD	0.6	NYSTANDARD		NA	NA	NA	NA	NA		
SW8270C	PHENOL	N	UG/L	1	NYSTANDARD				NA	NA	NA	NA	NA		
SW8310	BENZO[K]FLUORANTHENE	N	UG/L	0.002	NYGUIDANCE			0.01	NA	NA	NA	NA	NA		
SW8310	PHENANTHRENE	N	UG/L	50	NYSTANDARD	50	NYGUIDANCE		NA	NA	NA	NA	NA		0.02
SW8310	PYRENE	N	UG/L	50	NYGUIDANCE			0.02	NA	NA	NA	NA	NA		
SW8330	2,4-DINITROTOLUENE	N	UG/L	5	NYSTANDARD	0.07	NYSTANDARD	0.26							
SW8330	RDX	N	UG/L	3.2	NYGUIDANCE				13	1.4					

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 11.1-4 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Waste Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	GROUND-WATER ACTION LEVEL	GROUND-WATER ACTION LEVEL TYPE	C7-NFSS-WW-SS9	C7-NFSS-WW-ST6	C7-NFSS-WW-ST9	C7-NFSS-WW-ST9-DUP
SW6010	ALUMINUM	T	UG/L			132 B	189 B	802	514
SW6010	ANTIMONY	T	UG/L	3	NYGUIDANCE	3.1 B	1 B	1.8 B	1.8 B
SW6010	ARSENIC	T	UG/L	25	NYSTANDARD			4.1 B	2 B
SW6010	BARIUM	T	UG/L	1000	NYSTANDARD	58.1 B	55 B	59.7 B	53.2 B
SW6010	BORON	T	UG/L	1000	NYSTANDARD	74.6 B	62.7 B	113	79 B
SW6010	CALCIUM	T	UG/L			78800 E*	73000 E*	63800 E*	60400 E*
SW6010	CHROMIUM	T	UG/L	50	NYSTANDARD				
SW6010	COPPER	T	UG/L	200	NYSTANDARD			2.4 B	2.6 B
SW6010	IRON	T	UG/L	300	NYSTANDARD	1280 E*	593 E*	1430 E*	1320 E*
SW6010	LEAD	T	UG/L	25	NYSTANDARD			1.1 B	1.2 B
SW6010	LITHIUM	T	UG/L			8.8 B		4.7 B	5.6 B
SW6010	MAGNESIUM	T	UG/L	35000	NYSTANDARD	16400 *	9870 *	16300 *	15500 *
SW6010	MANGANESE	T	UG/L	300	NYSTANDARD	370 *	77.8 *	691 *	649 *
SW6010	POTASSIUM	T	UG/L			5720 *	5070 *	7460 *	6970 *
SW6010	SELENIUM	T	UG/L	10	NYSTANDARD	5.7			
SW6010	SILVER	T	UG/L	50	NYSTANDARD			1.3 B	
SW6010	SODIUM	T	UG/L	20000	NYSTANDARD	4850 *	2040 *	14000 *	13600 *
SW6010	VANADIUM	T	UG/L						
SW6010	ZINC	T	UG/L	300	NYSTANDARD				
SW7470	MERCURY	T	UG/L	2	NYSTANDARD				
SW8081	ALPHA-BHC	N	UG/L	0	NYSTANDARD			0.007 P	
SW8081	GAMMA-BHC	N	UG/L	0	NYSTANDARD				
SW8081	HEPTACHLOR EPOXIDE	N	UG/L	0	NYSTANDARD		0.0081 P		
SW8260B	1,1-DICHLOROETHANE	N	UG/L	5	NYSTANDARD				
SW8260B	2-BUTANONE	N	UG/L	50	NYGUIDANCE				
SW8260B	ACETONE	N	UG/L	50	NYGUIDANCE				3
SW8260B	TETRACHLOROETHENE	N	UG/L	5	NYSTANDARD				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 11.1-4 Component 7, Former Underground LOOW Utilities, Summary of Detected Analytes in Waste Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	GROUND-WATER ACTION LEVEL	GROUND-WATER ACTION LEVEL TYPE	C7-NFSS-WW-SS9	C7-NFSS-WW-ST6	C7-NFSS-WW-ST9	C7-NFSS-WW-ST9-DUP
SW8260B	TOLUENE	N	UG/L	5	NYSTANDARD			3	2
SW8260B	TRICHLOROETHYLENE	N	UG/L	5	NYSTANDARD				
SW8270C	4-METHYLPHENOL	N	UG/L						51
SW8270C	BIS(2-ETHYLHEXYL) PHTHALAT	N	UG/L	50	NYSTANDARD				39
SW8270C	PHENOL	N	UG/L	1	NYSTANDARD				9
SW8310	BENZO[K]FLUORANTHENE	N	UG/L	0.002	NYGUIDANCE				
SW8310	PHENANTHRENE	N	UG/L	50	NYSTANDARD				
SW8310	PYRENE	N	UG/L	50	NYGUIDANCE				
SW8330	2,4-DINITROTOLUENE	N	UG/L	5	NYSTANDARD				
SW8330	RDX	N	UG/L	3.2	NYGUIDANCE				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 11.2-1 Component 7, LOOW Utilities 30-in Outfall, Summary of Detected Analytes in Soil (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	SOIL ACTION LEVEL	USEPA Reg 9 PRG SOIL ACTION LEVEL TYPE	SEDIMENT ACTION LEVEL	SEDIMENT ACTION LEVEL TYPE	C7-30-SO-02-16-REP	C7-30-SO-09-12-REP	C7-30-SO-11-8-REP	C7-30-SO-13-8-REP	C7-30-SO-15-6-REP	C7-30-SO-17-6-REP	C7-30-SO-17-DUP-REP
SW6010	BORON	MG/KG		5500			8.2 B	7.4 B	7.7 B	5.2 B	4.8 B	5.8 B	4.8 B
SW6010	LITHIUM	MG/KG		1600			23.2	25.6	21.9	24.9	26.7	26	25.9

Background

~ 5.86 mg/kg =

26.7

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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sediment comparison criteria in the samples collected from PIPE1, SUMP1, and SUMP2. PAHs exceeded 1/10th of the criteria in the sludge sample collected from PIPE2. The reported concentration of dieldrin exceeded the soil comparison criteria in the samples collected from PIPE1 and PIPE2. PCB exceeded the sediment screening criteria in the samples collected from SUMP1 and SUMP2. The reported PCB concentration in SUMP2 exceeded the soil comparison criteria as well. Several metals exceeded both the NY State soil and sediment screening criteria. Cyanide and explosives were not reported in the sludge samples collected from within the sumps and associated lines.

11.4 CONCLUSIONS AND RECOMMENDATIONS

Results indicate that the former LOOW underground lines contain wastewater and sludge with COPC in concentrations that exceed screening criteria. Due to the age of the lines and the potential for deterioration of the concrete and vitreous clay, there exists the possibility of impact to the surrounding media from the COPC within the pipelines. Further investigation to evaluate the potential impact to surrounding soil and ground water is recommended. The presence of explosives and the elevated boron within some of the manholes within Component 1 and Component 3 suggest impact from DOD use. However, those underground lines within Component 1 and Component 3 have been impacted by non-DOD sources. As such, the underground lines on Component 1 and Component 3 are not be eligible for further investigation under this HTRW project.

Results from the Phase I investigation of the 30-in. outfall line did not indicate an impact from DOD marker compounds to subsurface soil. Further investigation of the 30-in. outfall is not recommended.

Results indicate the presence of PAH, pesticides, PCB, and metals within the sumps and associated lines as well as beneath the lines (see analytical results for the soil samples collected from beneath the sump pipelines in Section 9.6) within the acid concentration area of Component 5. Therefore, further investigation in the vicinity of the sumps on NFSS is recommended to evaluate the extent of COPC on the subsurface soil and evaluate the possible impact to ground water. Additional investigation is recommended to determine where these underground sump pipes lead and whether they flow into the acid waste, sanitary sewer, or storm sewer lines, or if they are self contained.

In addition, elevated PAHs and phenols were reported in the sludge samples and elevated VOCs were reported in the wastewater samples collected from the storm water lines within NFSS. As these storm water lines originally discharged into the surface water drainages, it is recommended that an evaluation be made of whether the discharge points are still in existence or have been plugged. If discharge into a surface water drainage is occurring, further evaluation for the presence of potential COPC in the surface water and sediment around the discharge point is recommended.

It is further recommended that the investigation of the underground lines be performed under the on going remedial investigation of NFSS being conducted under the FUSRAP.

12. COMPONENT 8 (AFP-68 UTILITIES) DATA RESULTS AND EVALUATION

According to drawings circa 1959, the sanitary sewer system tied into several buildings throughout the former AFP-68 property and discharged through an 18-in. sanitary line to the WWTP. During a Preliminary Contaminant Assessment (PCA) conducted by Acres in 1992, existing sanitary sewer manholes, pumping stations, and sumps were located. Samples from the sanitary sewer lines and sumps were collected. Sample results are detailed in the Work Plan (EA 1998b). During the Phase I RI, a site reconnaissance was performed to confirm the location of the manholes and sewer lines sampled by Acres and to identify additional sanitary sewer manholes, if any.

As a result of the reconnaissance, one additional manhole was located that was not associated with a sanitary sewer line already sampled by Acres during the PCA. This manhole was named C7-CWM-SS2. and was located in the northern portion of Process Area 2. The manhole did not contain liquid or sediment; therefore, a sample was not collected. The one sewage pump station described by Acres as "inaccessible sewage pump" during the PCA (on the west side of the tank area in Process Area 20) was a lid only, and did not contain subsurface structures.

Additional manholes, associated with the storm water system, were located north of Building 30A-1 and northeast of Area 5 (see Figures 6.3-3 and 6.3-5). The storm sewer lines were not included in the Phase I investigation, and were not sampled.

In addition, the lines associated with the AFP-68 chemical waste lift stations are currently included in a design for remedial action. The design includes identifying secondary lines coming from the main lift stations. It would be a duplication of effort to include characterization/sampling of the lines in this investigation.

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13. COMPONENT 9 (SURFACE DRAINAGES) DATA RESULTS AND EVALUATION

In order to evaluate potential impact on surface water and sediment in the vicinity of the former LOOW site, investigation of surface drainage was included in the Phase I RI. Major surface drainages in the vicinity of the former LOOW site consists of Four Mile Creek and associated drainages, two branches of Six Mile Creek, and Twelve Mile Creek (Figure 13-1).

13.1 SITE BACKGROUND

13.1.1 Four Mile Creek and Associated Drainages

Two main drainages, the Central Drainage Ditch and Southwestern Drainage Ditch, discharge into Four Mile Creek. Secondary drainages that discharge into the Central Drainage Ditch include B, H, K, L, M, Q, Magazine Ditches, and Western Drainage Ditches (Figure 13-1). These secondary drainages were made during the construction of the former LOOW to aid in draining of the site.

13.1.2 Six Mile Creek

There are two branches of Six Mile Creek that drain the northeastern portion of the former LOOW (Figure 13-1). These branches are located north and northeast of the former LOOW magazine area. The drainage area of Six Mile Creek was used for TNT storage at the former LOOW, the NECW Depot, AFP-38, YTA, and the Army National Guard WETS. Because a portion of the eastern branch of Six Mile Creek is on property still owned by the DOD, that portion was not eligible for investigation under this DERP-FUDS HTRW project. Therefore, investigations of the drainages were limited to portions that drain formerly-used DOD sites, including AFP-38 and NECW, but were not located on property currently owned by the DOD.

13.1.3 Twelve Mile Creek

Twelve Mile Creek is located in the extreme eastern portion of the former LOOW site (Figure 13-1). The railroad yard, possible storage areas from AEC, the Control Area of the former NIKE site, CWM, and Modern Landfill were or are located within the drainage area of Twelve Mile Creek.

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13.2 SURFACE WATER AND SEDIMENT SAMPLING PROGRAM

Surface water and sediment samples were collected in accordance with the SOPs detailed in the Final Work Plan (EA 1998b).

13.2.1 Four Mile Creek and Associated Drainages

Central Drainage Ditch

Sampling locations were placed at approximately 1,000-ft intervals along the length of Central Drainage Ditch, with the exception of that length of the ditch that traverses the DOD-owned Army National Guard Weekend Training Site (WETS). In the portion of the Central Drainage Ditch within the production area of the former LOOW, sample locations were placed at the confluence of the secondary drainages with the Central Drainage Ditch. The first sample location within the Central Drainage Ditch was at the confluence of the Central Drainage Ditch with M Ditch. The last sample location was at the confluence of the Central Drainage Ditch with Four Mile Creek. Due to the inability to obtain property access, samples were not collected 1,000 ft upstream or downstream of the confluence of the Central Drainage Ditch with Four Mile Creek, as proposed in the Work Plan. Also, H Ditch does not flow into the Central Drainage Ditch, but rather, flows into a small lagoon. Therefore, a sample was not collected at the confluence of H Ditch and the Central Drainage Ditch as proposed in the Work Plan.

In the upper portion of the Central Drainage Ditch, upstream of the WETS, both sediment and surface water samples were collected from each sampling location within the ditch. Downstream of WETS sediment was collected from each location, and surface water samples were collected from every other sampling location.

Sediment samples only were collected at the head of the secondary drainages originating from the production area of the former LOOW, and draining into the Central Drainage Ditch. Section 13.1.1 lists those secondary drainages included in the investigation.

Sediment samples were field screened for VOCs, PAHs, PCB, and TNT. In addition, those sediment samples collected within the Central Drainage Ditch at the confluence of secondary drainages, and every other sampling location downstream of the WETS, were submitted for laboratory analysis of DOD marker compounds. A subset of sediment samples were analyzed for TOC and grain size. Because the organic content of sediments affects the sorption of some constituents into biota, the sediment criteria was adjusted based on an average of the TOC concentrations reported in the sediment samples collected in the Phase I investigation. Grain size analyses were performed for future risk assessment purposes and as such are not discussed herein.

Surface water samples were collected from those locations from which the sediment samples were submitted for laboratory analysis (Figure 13-1). Surface water samples were analyzed for DOD marker compounds and general water quality parameters.

Southwestern Drainage Ditch

Sediment samples from the Southwestern Drainage Ditch were collected from three locations: up gradient, adjacent to, and down gradient of the former LOOW slurry pond and administration area. Due to problems obtaining a right of entry for access, samples were not collected at the confluence of the Southwestern Drainage Ditch with Four Mile Creek, as proposed in the Work Plan. Sediment samples were field screened for VOCs, PAHs, PCB, and TNT. The sediment sample collected adjacent to the former LOOW slurry pond (4-SWD2) was submitted for laboratory analysis of DOD marker compounds. A surface water sample was collected from this location also, and submitted for laboratory analysis of DOD marker compounds and general water quality parameters.

Field screening for radiological activity was conducted at each location. Radioactivity was not reported, therefore samples were not submitted for laboratory analysis of radiological parameters.

13.2.2 Six Mile Creek

Sediment samples were collected at one location from the western branch and two locations from the eastern branch of Six Mile Creek. A right-of-entry was not obtained to allow access to the upstream sampling location (6-SD/SW-1) on the western branch of Six Mile Creek, therefore, this location was not sampled.

The downstream sample location for the western branch of Six Mile Creek (6-SW/SD-2) was located just upstream of Youngstown Lockport Road. Both a sediment and surface water sample was collected from this location. The upstream sample from the eastern branch of Six Mile Creek (6-SD/SW-3) was collected in the vicinity of the northern property boundary of the active WETS. The downstream sediment sample from the easternmost drainage (6-SW/SD-4) was collected just prior to Porter Center Road. Due to lack of flow, a surface water sample was not collected from 6-SW-4.

Sediment samples were field screened for VOCs, PAHs, PCB, and TNT. Sediment samples from 6-SD-3 and 6-SD-4, as well as the surface water sample collected from 6-SW-2, were submitted for laboratory analyses as well. Because of the possibility of impact from non-DOD sources, sediment and surface water samples were submitted for laboratory analysis of DOD marker compounds and chemical warfare degradation products only. Surface water samples were also submitted for general water quality parameters. Field screening for radiological activity was conducted. Radiological activity was not reported, therefore samples were not submitted for laboratory analysis of radiological parameters.

13.2.3 Twelve Mile Creek

Surface water and sediment samples were collected from Twelve Mile Creek at two locations, one at the head waters of the drainage on Modern Landfill property (12-SD-1) and the other at the eastern property line of the former LOOW near Porter Center Road (12-SD-2). Sediment samples were screened for VOCs, PAHs, PCB, and TNT. Because of the proximity of non-DOD activities that could potentially impact the creek, samples were submitted for laboratory analysis of DOD marker compounds, and hydrazine (to evaluate impact from the former NIKE base). In addition, surface water samples were analyzed for general water quality parameters. Field screening for radiological activity was conducted. Radiological activity was not reported, therefore samples were not submitted for laboratory analysis of radiological parameters.

13.2.4 Background Surface Water and Sediment Sampling

Background samples were collected in addition to the samples collected to evaluate possible impact from former DOD site use. The first background location (BKGD-SW/SD-1) was in Four Mile Creek just upstream of Route 18. The second location was placed on the Southwestern Drainage Ditch, just upstream of Swan Road. Surface water and sediment samples collected from background locations were submitted for analysis of DOD marker compounds.

13.3 SEDIMENT SCREENING RESULTS

Sediment screening results can be found in Table 13.3-1. Analytes that exceeded 1/10th of the NY State comparison criteria have been lightly shaded. Those analytes exceeding the full value of the criteria have been darkly shaded. PCB were reported in concentrations exceeding comparison criteria in the sediment samples collected from the head of H Ditch (4-HD-1). The duplicate sample collected from H Ditch confirmed the analysis. PCB were also reported in the duplicate field-screening sample collected from M Ditch (4-MD-1). However, PCB were not reported in the original analysis of this sample. Note that the detection limit for the PCB field screening analysis was 500 μg/kg, exceeding the sediment comparison criteria of 0.028 μg/kg. Therefore, PCB may be present in concentrations exceeding the criteria in the other sediment sampling locations.

PAHs were reported in each of the screening samples at concentrations that exceeded the sediment comparison criteria of 45.5 μg/kg. The highest concentration of PAHs, 24,373 μg/km, was reported in location 4-MD-1.

TNT was reported in location 4 at Six Mile Creek in concentrations that did not exceed 1/10th of the comparison criteria.

TCE, at a concentration of 67.63 μg/kg, was reported in the sample collected from location 9 in the Four Mile Creek drainage (Central Drainage Ditch). The reported concentration exceeded 1/10th of the NY State comparison criteria.

13.4 SEDIMENT LABORATORY ANALYSES AND CONFIRMATORY SAMPLING RESULTS

Laboratory analytical results for sediment samples can be found in Table 13.4-1. Background concentrations for boron were reported at 3.5 and 11.3 for SD-1 and SD-2, respectively. The background concentration for lithium was reported at 15.4 in SD-1 and was non-detect in SD-2.

Boron concentrations were generally highest in the Central Drainage Ditch, with the most elevated concentrations reported in the upstream locations, generally trending to lower concentrations in the downstream locations. Lithium concentrations varied. The highest concentrations were reported in locations 4, 6, 9, and 11 along the Central Drainage Ditch and in the samples from the Southwest Drainage Ditch and Western Drainage Ditch. Also, trace amounts of 4-amino-2,6-dinitrotoluene were reported in locations 4 and 6 along the Central Drainage Ditch.

Chemical warfare degradation products, and hydrazine were not reported in the sediment samples.

13.5 SURFACE WATER LABORATORY ANALYSES RESULTS

Laboratory analytical results for surface water samples can be found in Table 13.5-1. Analytes that exceed $1/10^{th}$ of the NY State comparison criteria have been lightly shaded. Analyte concentrations exceeding the full value of the criteria have been darkly shaded. Boron and lithium were reported in each of the surface water samples. The concentrations of boron reported in samples collected from locations 3, 4, 6, and 7 within the Central Drainage Ditch exceeded $1/10^{th}$ of the NY State comparison criteria. Within the Central Drainage Ditch, boron concentrations generally increased in the downstream direction, with the highest concentration reported at location 4-SW-7. Downstream of location 4-SW-7, the boron concentrations decreased.

Although a NY State surface water comparison criteria for lithium does not exist, the reported lithium concentrations exceeded the background concentrations in each of the samples collected from the drainages flowing out of the former production areas. The trend in lithium concentration generally mirrored that of the reported boron concentration within the Central Drainage Ditch, with the highest concentrations reported in locations 3, 4, 6, and 7. Lithium concentrations decreased in the upstream and downstream direction away from location 4-SW-3, which had the highest reported concentration of lithium.

Hydrazine exceeded the NY State comparison criteria in the upstream surface water sample collected from Twelve Mile Creek (12-SW-1). Trace concentrations of HMX were reported at the confluence of B Ditch and the Central Drainage Ditch (4-SW-6). Also, trace concentrations of RDX were reported at location 4-SW-9 along the Central Drainage Ditch approximately 2,000 ft northwest of the WETS property line.

13.6 CONCLUSIONS AND RECOMMENDATIONS

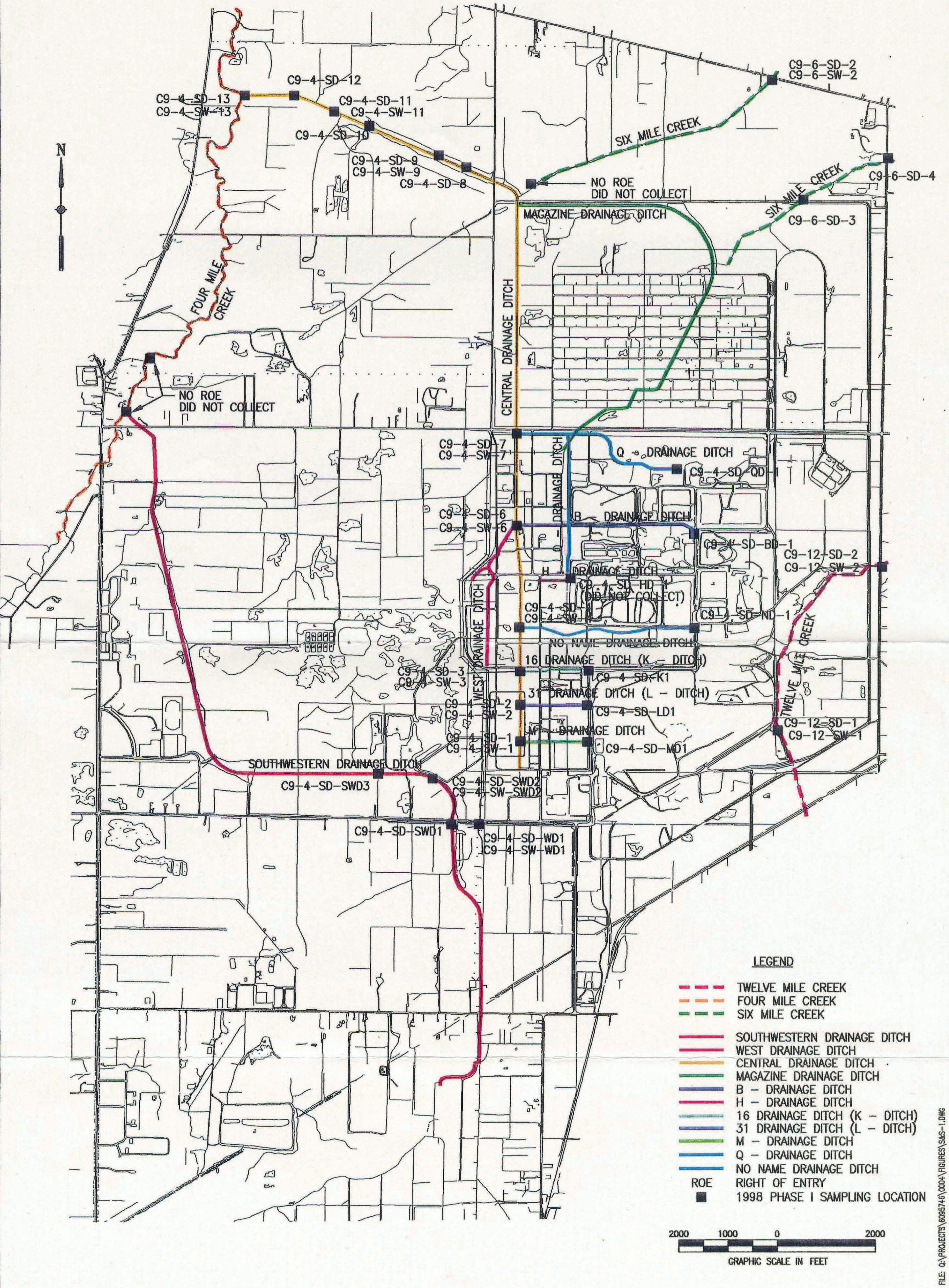
The presence of hydrazine within Twelve Mile Creek is likely due to the past use of the area by the DOD for a NIKE Base.

The elevated boron and lithium reported in the surface water and sediment within the Central Drainage Ditch is likely due to activities associated with the former AFP-68. Available site plans of the former AFP-68 plant indicate that surface drainages and underground storm water lines discharged to the Central Drainage Ditch (Acres 1992).

In addition, elevated PCB were reported in the sediment sample collected from the H Ditch. The H Ditch is located in an area that currently drains the central portion of the CWM facility.

Due to the possible impact from non-DOD site use, the surface water drainages discussed above may not be eligible for further evaluation within this DERP-FUDS HTRW project. An evaluation of determination of eligibility of the drainages for further investigation is recommended.

However, because the M-Ditch is located within the NFSS, which has been within government ownership since 1941, it is recommended that the reported presence of PCB in the M Ditch be confirmed and the extent of impact evaluated. It is further recommended that this evaluation be performed within the ongoing FUSRAP investigation for the NFSS.



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EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BASEWIDE RI/FS
LAKE ONTARIO ORDNANCE WORKS
NIAGARA COUNTY, NEW YORK

COMPONENT 9 (SURFACE DRAINAGE)
SEDIMENT AND SURFACE-WATER
SAMPLING LOCATIONS

PROJECT MGR.	DESIGNED BY	DRAWN BY	CHECKED BY	DATE	SCALE	PROJECT NO.	FILE NAME	DRAWING NO.	FIGURE
HGP	DAB	FDV	SMS	MAY 1999	AS SHOWN	60957.46	S&S-1	-	13-1

Table 13.3-1 Background and Component 9, Surface Drainage, Summary of Detected Analytes in Sediment (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-SD-1	BKGD-SD-2	C9-12-SD-1-DUP	C9-12-SD-1-REP	C9-12-SD-2-REP	C9-4-SD-1-DUP	C9-4-SD-1-REP	C9-4-SD-10	C9-4-SD-11-REP	C9-4-SD-12	C9-4-SD-13-REP
E4020	PCB	UG/KG	0.028	NYBIOACCUM			NA								
E4035	PAH	UG/KG	45.5	NYBIOACCUM	4235	1463	NA	11368	7204	11980	19061	3683	2250	1807	1041
E4050	2,4,6-TRINITROTOLUENE	UG/KG					NA								
GC	TRICHLOROETHYLENE	UG/KG	70	NYBIOACCUM						NA					

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 13.3-1 Background and Component 9, Surface Drainage, Summary of Detected Analytes in Sediment (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-SD-1	C9-4-SD-2-REP	C9-4-SD-3-DUP	C9-4-SD-3-REP	C9-4-SD-4-REP	C9-4-SD-6-REP	C9-4-SD-7-DUP	C9-4-SD-7-REP	C9-4-SD-8	C9-4-SD-8-DUP	C9-4-SD-9-REP	C9-4-SD-BD-1
E4020	PCB	UG/KG	0.028	NYBIOACCUM			NA				NA					
E4035	PAH	UG/KG	45.5	NYBIOACCUM	4235	11476	NA	15240	9005	9803	NA	3232	4571	2913	1814	15320
E4050	2,4,6-TRINITROTOLUENE	UG/KG					NA				NA					
GC	TRICHLOROETHYLENE	UG/KG	70	NYBIOACCUM										NA	67.63	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = [illegible]tected

Table 13.3-1 Background and Component 9, Surface Drainage, Summary of Detected Analytes in Sediment (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-SD-1	C9-4-SD-HD-1	C9-4-SD-HD-1-DUP	C9-4-SD-KD-1	C9-4-SD-LD-1	C9-4-SD-MD-1	C9-4-SD-MD-1-DUP	C9-4-SD-ND-1	C9-4-SD-QD-1	C9-4-SD-SWD-1	C9-4-SD-SWD-2-REP
E4020	PCB	UG/KG	0.028	NYBIOACCUM		2460	2500				240				
E4035	PAH	UG/KG	45.5	NYBIOACCUM	4235	8506	8618	6139	12214	24373	23917	3738	1447	8252	12700
E4050	2,4,6-TRINITROTOLUENE	UG/KG													
GC	TRICHLOROETHYLENE	UG/KG	70	NYBIOACCUM			NA				NA				

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 13.3-1 Background and Component 9, Surface Drainage, Summary of Detected Analytes in Sediment (Field-Screening Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-SD-1	C9-4-SD-SWD-3	C9-4-SD-WD1-REP	C9-6-SD-2-REP	C9-6-SD-3-DUP	C9-6-SD-3-REP	C9-6-SD-4-REP
E4020	PCB	UG/KG	0.028	NYBIOACCUM					NA		
E4035	PAH	UG/KG	45.5	NYBIOACCUM	4235	11051	6882	2074	NA	2317	11103
E4050	2,4,6-TRINITROTOLUENE	UG/KG							NA		100
GC	TRICHLOROETHYLENE	UG/KG	70	NYBIOACCUM							

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 13.4-1 Background and Component 9, Surface Drainage, Summary of Detected Analytes in Sediment (Laboratory Analytical Results)

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-SD-1	BKGD-SD-2	C9-12-SD-1-REP	C9-12-SD-2-REP	C9-4-SD-1-REP	C9-4-SD-11-REP	C9-4-SD-13-REP	C9-4-SD-2-REP	C9-4-SD-3-REP	C9-4-SD-4-REP	C9-4-SD-6-DUP-REP
SW6010	BORON	MG/KG			3.5 B	11.3 E*	5.7 B	23.7 E*	43.8 E*	13.4 B	2.5 B	36.9 E*	35.4 E*	20.6	15.7 B
SW6010	LITHIUM	MG/KG			15.4 E*		15.1	7.1 B	18.2 B	32.3 E*	12.8 E*	20.4	20.2	43.3 E*	35.3 E*
SW8330	4-AMINO-2,6-DINITROTOLUENE	MG/KG												0.24	0.17
SW9060	TOTAL ORGANIC CARBON	MG/KG			22000	NA	36200	35000	NA	59700 >	10000	NA	NA	NA	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 13.4-1 **Background and Component 9, Surface Drainage, Summary of Detected Analytes in Sediment (Laboratory Analytical Results)**

METHOD	ANALYTE	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-SD-1	C9-4-SD-6-REP	C9-4-SD-7-REP	C9-4-SD-9-REP	C9-4-SD-SWD-2-REP	C9-4-SD-WD1-DUP-REP	C9-4-SD-WD1-REP	C9-6-SD-2-REP	C9-6-SD-3-REP	C9-6-SD-4-DUP	C9-6-SD-4-REP
SW6010	BORON	MG/KG			3.5 B	18.7 B	4 B	11 B	9.8 B	18.3	25.8	2.6 B	5.9 B	9.1 B	7.7 B
SW6010	LITHIUM	MG/KG			15.4 E*	38.7 E*	19.5 E*	33.6 E*	41.9	28	44.7	27.7 E*	18	21.2	21.1
SW8330	4-AMINO-2,6-DINITROTOLUENE	MG/KG				0.23									
SW9060	TOTAL ORGANIC CARBON	MG/KG			22000	NA	9330	28700	90900	NA	NA	11100	NA	NA	NA

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = etected

Table 13.5-1 Background and Component 9, Surface Drainage, Summary of Detected Analytes in Surface Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	BKGD-SW-1	BKGD-SW-2	C9-12-SW-1	C9-12-SW-2	C9-4-SW-1	C9-4-SW-1-DUP	C9-4-SW-11	C9-4-SW-13
ASTM1385	HYDRAZINE	N	UG/L	5	NYSTANDARD	NA	NA	44		NA	NA	NA	NA
E300	CHLORIDE	N	MG/L			NA	37 D	100 D	150 D	90 D	90 D	43 D	130 D
E300	FLUORIDE	N	MG/L			0.29	0.96		0.38	2.4	2.4	0.75	0.03
E300	NITROGEN, NITRATE	N	MG/L			0.14	0.14					0.05	0.23
E300	SULFATE	N	MG/L			NA	37 D	180 D	41 D	240 D	230 D	190 D	88 D
E350.1	NITROGEN, AMMONIA	N	MG/L			0.04		0.14		0.1	0.58	0.07	0.13
E351.2	NITROGEN, TOTAL KJELDAHL	N	MG/L			0.79	0.1	0.59	3.1	1.3	2.2	0.88	0.75
E376.1	SULFIDE, TOTAL	N	MG/L									7.6	1.5
E405.1	OXYGEN DEMAND, BIOCHEMICAL	N	MG/L			1.7		5.1	17.2	19.4	5.8	0.25	0.4
E410.4	OXYGEN DEMAND, CHEMICAL	N	MG/L			37.4	35.5	15.6	151	71.7	72.4	43.9	39.4
SW6010	BORON	T	UG/L	10000	NYSTANDARD	52.2 B	66.6	133	104	484	440	265	158
SW6010	LITHIUM	T	UG/L			4.1 B	2	14.8	12.2	32.3	37.7	32.3	7.3 B
SW8330	HMX	N	UG/L										
SW8330	RDX	N	UG/L										

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 13.5-1 Background and Component 9, Surface Drainage, Summary of Detected Analytes in Surface Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C9-4-SW-2	C9-4-SW-3	C9-4-SW-4	C9-4-SW-6	C9-4-SW-7	C9-4-SW-9	C9-4-SW-SWD2	C9-4-SW-WD-1-DUP	C9-4-SW-WD-1-REP
ASTM1385	HYDRAZINE	N	UG/L	5	NYSTANDARD	NA	NA	NA	NA	NA	NA	NA	NA	NA
E300	CHLORIDE	N	MG/L			150 D	200 D	NA	NA	NA	34 D	99 D	260	250 D
E300	FLUORIDE	N	MG/L			1	0.61	0.76	0.92	0.97	0.59	0.46	0.16	0.09
E300	NITROGEN, NITRATE	N	MG/L			0.17	0.3	0.07	0.07	0.16	0.01	0.16		
E300	SULFATE	N	MG/L			760 D	1100 D	NA	NA	NA	140 D	84 D	200	320 D
E350.1	NITROGEN, AMMONIA	N	MG/L			0.33	0.08	0.35	0.07	0.27	0.09	0.4	0.86	0.83
E351.2	NITROGEN, TOTAL KJELDAHL	N	MG/L			0.57	1.1	0.87	0.12	1.1	0.23	0.54	3.2	4.5
E376.1	SULFIDE, TOTAL	N	MG/L								1.3		1.7	
E405.1	OXYGEN DEMAND, BIOCHEMICAL	N	MG/L			2.2	3	1.8	1.9	3.7	2.8	3.6	16.1	41.4
E410.4	OXYGEN DEMAND, CHEMICAL	N	MG/L			56.8	47.8	72.4	56.2	46.5	58.8	33	230	306
SW6010	BORON	T	UG/L	10000	NYSTANDARD	814	1150	1530	1600	2020	186	153	105	162
SW6010	LITHIUM	T	UG/L			88.9	155	149	120	116	23.2	8.3 B	23.9	27.5
SW8330	HMX	N	UG/L						0.43				NA	
SW8330	RDX	N	UG/L								0.22		NA	

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

Table 13.5-1 Background and Component 9, Surface Drainage, Summary of Detected Analytes in Surface Water (Laboratory Analytical Results)

METHOD	ANALYTE	T/D	UNIT	ACTION LEVEL	ACTION LEVEL TYPE	C9-6-SW-2
ASTM1385	HYDRAZINE	N	UG/L	5	NYSTANDARD	NA
E300	CHLORIDE	N	MG/L			310 D
E300	FLUORIDE	N	MG/L			0.05
E300	NITROGEN, NITRATE	N	MG/L			
E300	SULFATE	N	MG/L			76 D
E350.1	NITROGEN, AMMONIA	N	MG/L			0.15
E351.2	NITROGEN, TOTAL KJELDAHL	N	MG/L			1.1
E376.1	SULFIDE, TOTAL	N	MG/L			11.7
E405.1	OXYGEN DEMAND, BIOCHEMICAL	N	MG/L			8.6
E410.4	OXYGEN DEMAND, CHEMICAL	N	MG/L			102
SW6010	BORON	T	UG/L	10000	NYSTANDARD	65.5
SW6010	LITHIUM	T	UG/L			10.2
SW8330	HMX	N	UG/L			
SW8330	RDX	N	UG/L			

Note: Refer to Table 4.1-1 (Comprehensive Key to "Hits Only" Tables) for descriptions of cell contents, sample designations, data qualifiers, and acronyms.
NA = not analyzed
blank = not detected

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