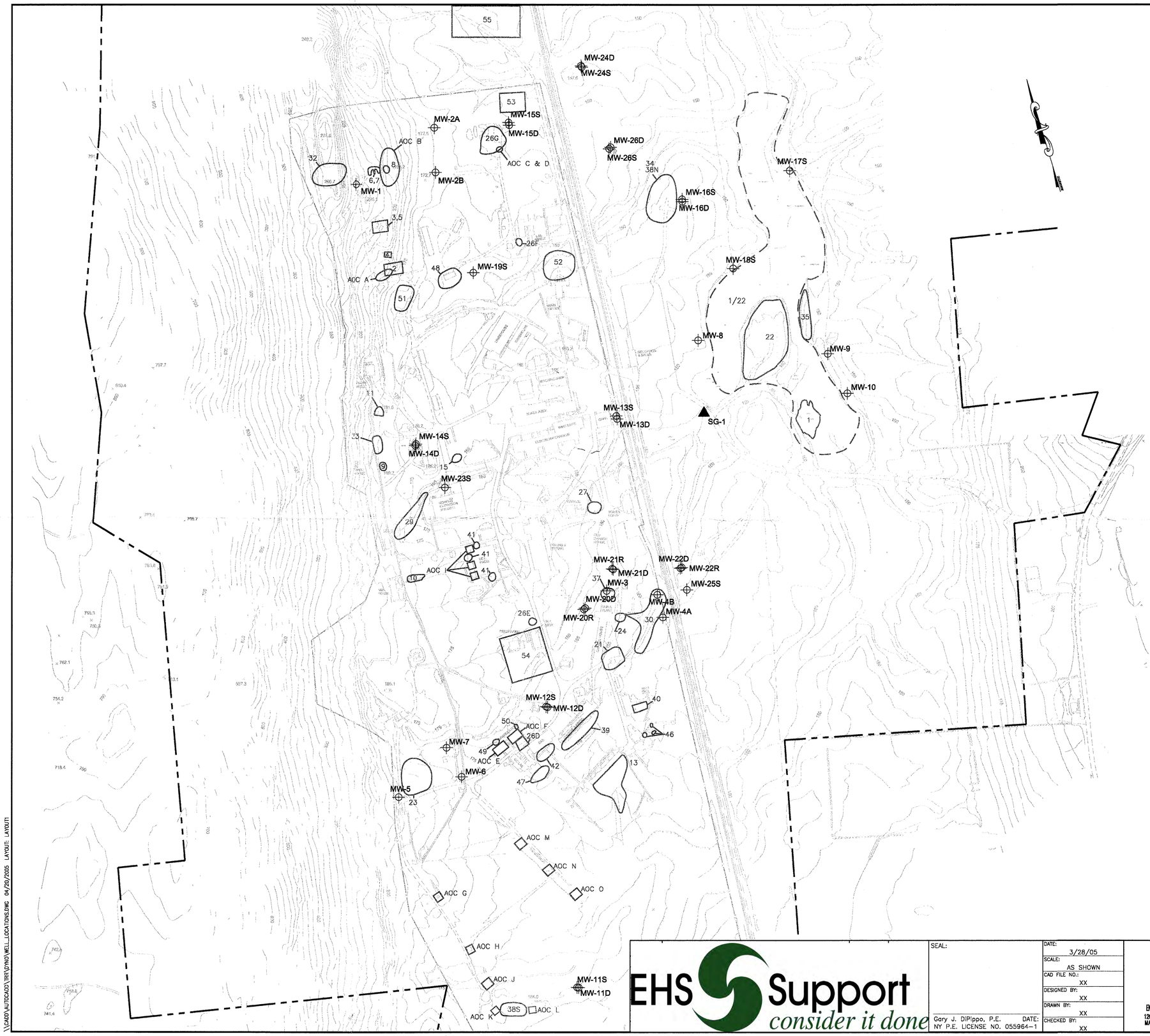


SWMU

1. SHOOTING POND
2. BURNING CAGE/INCINERATOR
3. COPPER WIRE BURNING AREA
4. IRON WIRE BURNING AREA
5. WIRE BURNING AREA
6–7. OPEN BURNING PADS
8. FORMER BURNING AREA
9. WASTE POWDER CATCH BASINS–BUILDING 2037
10. WASTE POWDER CATCH BASINS–BUILDING 2048
11. WASTE POWDER CATCH BASINS–BUILDING 2049
13. FORMER WASTE POWDER CATCH BASINS–LEAD AZIDE BUILDING
15. WASTE POWDER MAGAZINE–BUILDING 9216
21. LEAD RECYCLING UNIT AREA
22. FORMER LANDFILL
23. FORMER DUMP
24. FORMER WASTEWATER TREATMENT FACILITY
26. BURNABLE WASTE SATELLITE ACCUMULATION AREAS
27. SANITARY SEWER SYSTEM (NOT ILLUSTRATED ON THIS DRAWING)
29. DRAINAGE DITCH (DOWNGRADE OF BUILDING 2049)
30. DRAINAGE DITCH (DOWNGRADE OF BUILDING 2036)
32. OLD DUMP (NEAR WATER TOWER)
33. MERCURY FULMINATE TANKS AREA
34. OLD WASTE BURNING GROUNDS (NEAR SHOOTING POND)
35. STONE FENCE DUMP
37. FORMER SHELL PLANT DRUM STORAGE AREA
38. GRENADE DISPOSAL AREA
39. FORMER WASTEWATER DISCHARGE AREA–BUILDING 2009
40. PILOT LINE CONDENSATE COLLECTION SUMP
41. DETONATOR PRODUCTION BUILDING CONDENSATE COLLECTION SUMPS
42. SAC BUILDING STEAM COLLECTION CONTAINERS
46. VACUUM LINE CONDENSATE COLLECTION SUMP (BUILDING 2059)
47. BUILDING 2058 AREA
48. MERCURY FULMINATE AREA
49. BUILDING 2073 SUMP
50. BUILDING 2075 SUMP
51. CONSTRUCTION STOCK PILES
52. FORMER COMMERCIAL LAB SHOOTING AREA
53. PACKAGE BURN TEST AREA
54. FORMER PRODUCTION AREA
55. FORMER ANFO AREA
56. VENT SYSTEM FOR STATIC SECURITY TESTING CHAMBER
1/22. COMBINED AREA FOR SWMU'S 1&22

A KEROSENE TANK LEAK
B OPEN BURNING PADS AREA
C OPEN DETONATION PIT
D DETONATION TEST BUILDING
E FORMER BUILDING 2073
F BUILDING 2075
G FORMER DRYING HOUSE
H FORMER DRYING HOUSE
I ROOF DRAINAGE FROM DETO BUILDING
J FORMER DRYING HOUSE
K FORMER DRYING HOUSE
L FORMER DRYING HOUSE
M FORMER DRYING HOUSE
N FORMER DRYING HOUSE
O FORMER DRYING HOUSE

LEGEND:

MW-12S — MONITORING WELL LOCATION

SG-1 — STAFF GAUGE

23 — SOLID WASTE MANAGEMENT UNITS

APPROXIMATE PROPERTY BOUNDARIES

200 0 200 400
SCALE IN FEET

EHS Support consider it done

SEAL:

Gary J. DiPippo, P.E. DATE:
NY P.E. LICENSE NO. 055964-1

DATE:	3/28/05
SCALE:	AS SHOWN
CAD FILE NO.:	XX
DESIGNED BY:	XX
DRAWN BY:	XX
CHECKED BY:	XX

HYDROQUAL ENVIRONMENTAL ENGINEERS AND SCIENTISTS, P.C.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430

LOCATION OF SWMUS, AOCs, AND MONITORING WELLS

DYNO NOBEL SITE
PORT EWEN, NEW YORK

PROJECT NO. SEMD.004.002

DRAWING NO. FIGURE 2-5

SHEET X OF X

\\CADD\AUTOCAD\TRY\DYNO\WELL_LOCATIONS.DWG 04/20/2005 LAYOUT: LAYOUT1

N
LEGEND
ECKENFELDER INC.
HERCULES INC./DYNO-NOBEL INC.
DYNO-NOBEL SITE
PORT EWEN, NEW YORK
GENERALIZED ISOPACHOUS MAP
OVERBURDEN/FILL DEPOSITS
SCALE: AS SHOWN
9556-03

Figure 2-6

N
150
145
140
165
160
155
LEGEND
MW-125
MONITORING WELL LOCATION
(160.4)
POTENTIOMETRIC SURFACE ELEVATION
FEET, ABOVE N.G.V.D.
140
POTENTIOMETRIC SURFACE CONTOUR
GENERALIZED DIRECTION OF GROUNDWATER FLOW
ECKENFELDER INC.
HERCULES INC./DYNO-NOBEL INC.
DYNO-NOBEL SITE
PORT EWEN, NEW YORK
GENERALIZED POTENTIOMETRIC SURFACE MAP
SHALLOW OVERBURDEN WELLS
OCTOBER 4, 1995
SCALE AS SHOWN
9596-04

Figure 2-7

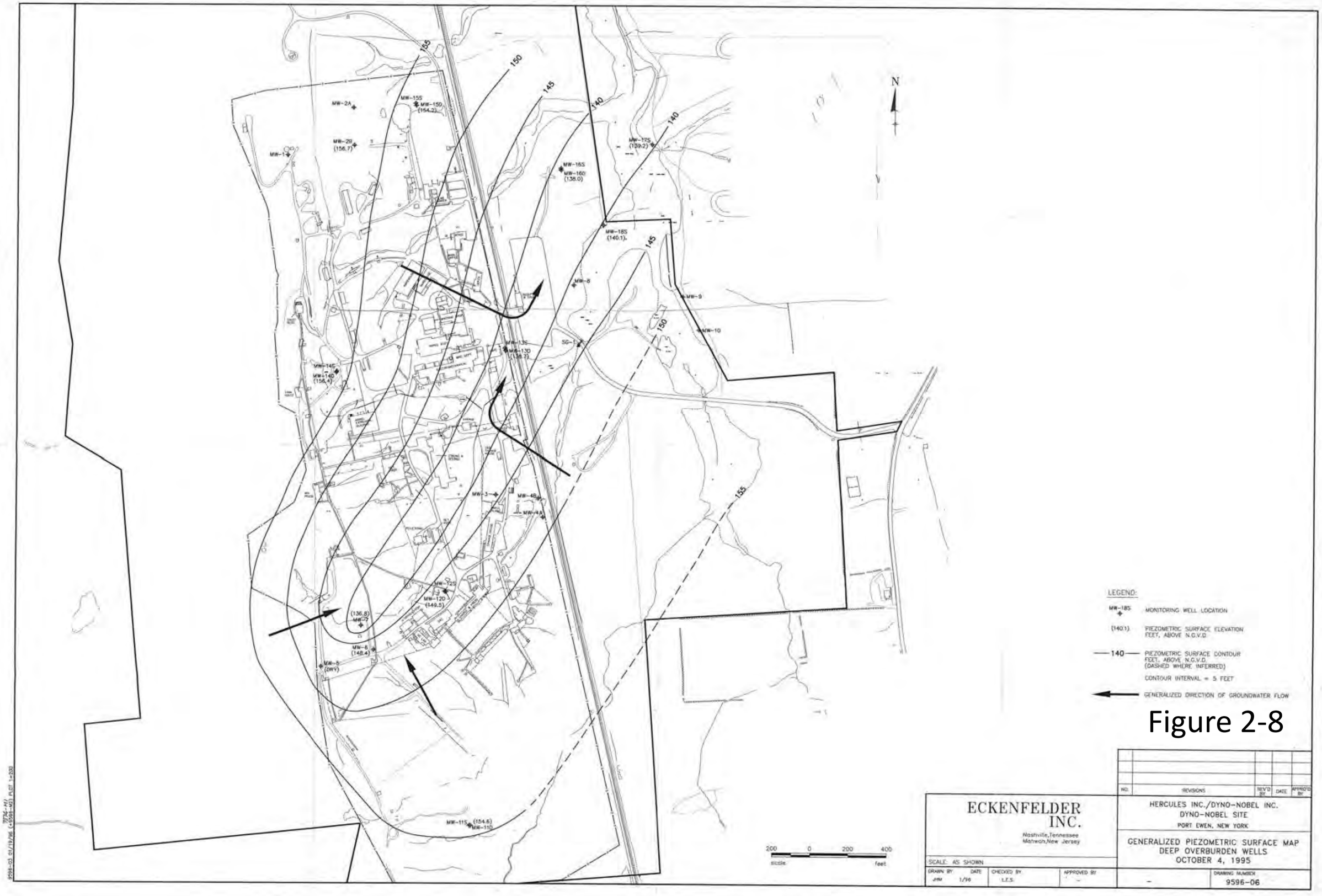
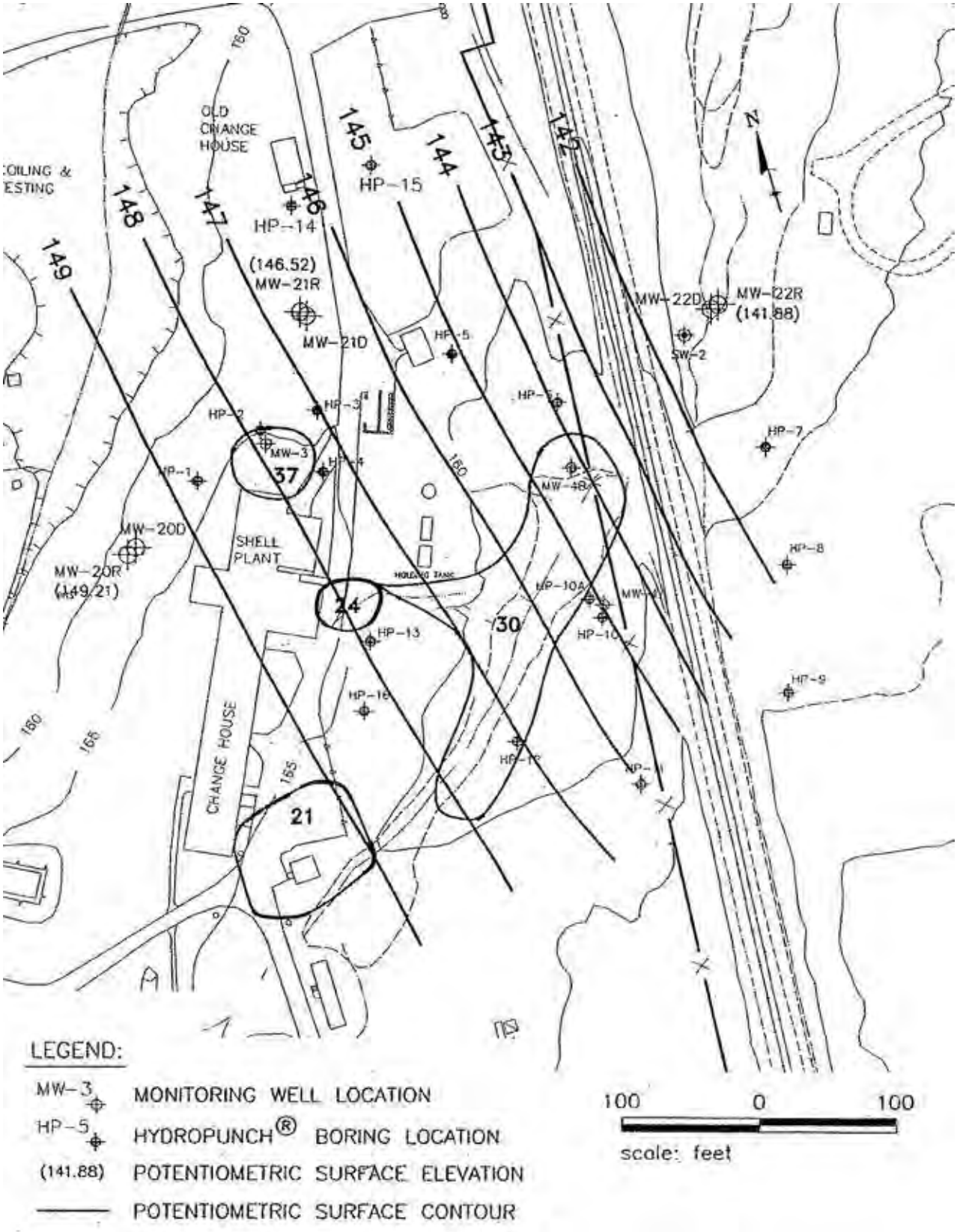

N
155
150
145
140
MW-2A
MW-15S
MW-15D
(154.2)
MW-2B
(156.7)
MW-1
MW-16S
MW-16D
(138.0)
MW-17S
(139.2)
MW-18S
(140.1)
MW-8
MW-9
MW-10
SG-1
MW-13S
MW-13D
(158.7)
MW-14S
MW-14D
(156.4)
MW-3
MW-4B
MW-4A
MW-12S
MW-12D
(149.5)
(136.8)
MW-7
MW-6
(148.4)
MW-5
(DRY)
MW-11S
(154.6)
MW-11D
LEGEND:
MW-18S
MONITORING WELL LOCATION
(140.1)
PIEZOMETRIC SURFACE ELEVATION
FEET, ABOVE N.G.V.D.
140
PIEZOMETRIC SURFACE CONTOUR
FEET, ABOVE N.G.V.D.
(DASHED WHERE INFERRED)
CONTOUR INTERVAL = 5 FEET
GENERALIZED DIRECTION OF GROUNDWATER FLOW
200 0 200 400
scale
feet
ECKENFELDER INC.
Nashville, Tennessee
Mahwah, New Jersey
SCALE: AS SHOWN
DRAWN BY JHM
DATE 1/96
CHECKED BY L.E.S.
APPROVED BY
NO.
REVISIONS
REV'D BY
DATE
APPRO'D BY
HERCULES INC./DYNO-NOBEL INC.
DYNO-NOBEL SITE
PORT EWEN, NEW YORK
GENERALIZED PIEZOMETRIC SURFACE MAP
DEEP OVERBURDEN WELLS
OCTOBER 4, 1995
DRAWING NUMBER
9596-06

Figure 2-8

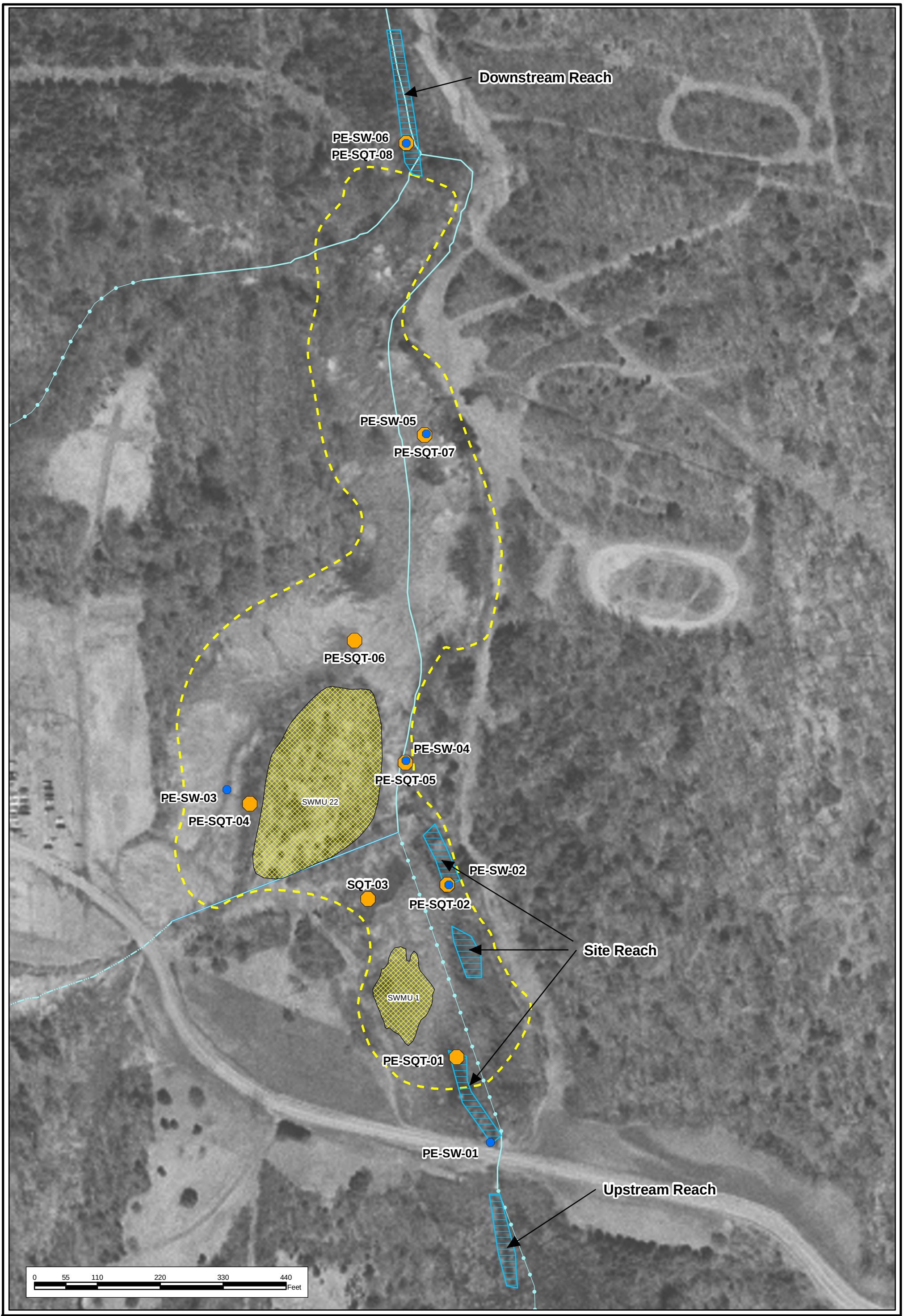
N
ECKENFELDER INC.
HERCULES INC./DYNO-NOBEL INC.
DYNO-NOBEL SITE
GENERALIZED STRUCTURAL CONTOUR MAP
TOP OF BEDROCK
9508-02

Figure 2-9



Source: RCRA Facility Investigation Report
Brown & Caldwell, December 1999

EHS Support *consider it done*	**POTENTIOMETRIC SURFACE MAP – TOP OF BEDROCK** **SEPTEMBER 28, 1999** **DYNO NOBEL SITE** **PORT EWEN, NEW YORK**	**FIGURE** **2-10**



Legend

- SURFACE WATER SAMPLING STATION
- SQT SEDIMENT SAMPLING STATION
- FISH SAMPLING REACH
- APPROXIMATE SWMU/AOC BOUNDARY
- PERENNIAL STREAM
- INTERMITTENT STERAM
- CONNECTOR
- ARTIFICIAL PATH

N

FIGURE 2-11
SEDIMENT QUALITY TRIAD, SURFACE WATER, AND FISH SAMPLING LOCATIONS
SWMU 1/22 WETLAND COMPLEX
DYNO NOBEL SITE, PORT EWEN, NEW YORK

Map Source:
Image: NYSGIS (2004)
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support
consider it done

Legend

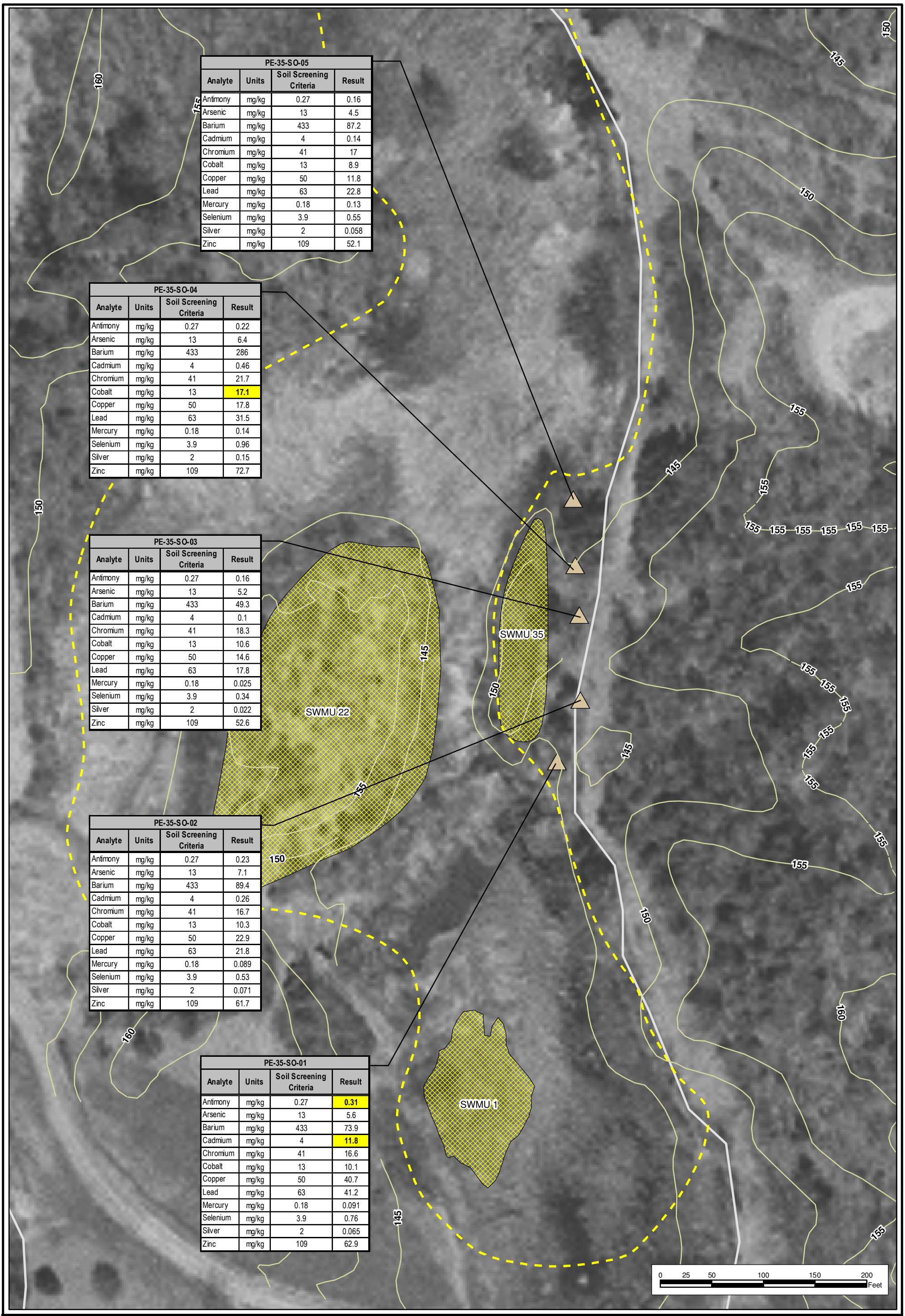
- ACTIVE PLANT SOIL
- EARTHWORM
- *Microtus pennsylvanicus*
- *Peromyscus leucopus*
- *Zapus hudsonius*
- SMALL MAMMAL TRANSECTS
- SMALL MAMMAL TRANSECT END POINTS
- RAILROAD
- SWMU 1/22 BOUNDARY
- BIOLOGICAL TISSUE AND SOIL SAMPLING GRID
- APPROXIMATE SWMU/AOC BOUNDARY
- APPROXIMATE PROPERTY BOUNDARY

N

FIGURE 2-12
ACTIVE PLANT AREA SAMPLING LOCATIONS
DYNO NOBEL SITE, PORT EWEN, NEW YORK

Map Source:
Fresh water wetlands: New York State Department of Environmental Conservation
Surface water: National Hydrography Dataset
Countours: United States Department of Agriculture/Natural Resource Conservation Service - National Cartography and Geospatial Center digital elevation models
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support consider it done



PE-35-SO-05			
Analyte	Units	Soil Screening Criteria	Result
Antimony	mg/kg	0.27	0.16
Arsenic	mg/kg	13	4.5
Barium	mg/kg	433	87.2
Cadmium	mg/kg	4	0.14
Chromium	mg/kg	41	17
Cobalt	mg/kg	13	8.9
Copper	mg/kg	50	11.8
Lead	mg/kg	63	22.8
Mercury	mg/kg	0.18	0.13
Selenium	mg/kg	3.9	0.55
Silver	mg/kg	2	0.058
Zinc	mg/kg	109	52.1

PE-35-SO-04			
Analyte	Units	Soil Screening Criteria	Result
Antimony	mg/kg	0.27	0.22
Arsenic	mg/kg	13	6.4
Barium	mg/kg	433	286
Cadmium	mg/kg	4	0.46
Chromium	mg/kg	41	21.7
Cobalt	mg/kg	13	17.1
Copper	mg/kg	50	17.8
Lead	mg/kg	63	31.5
Mercury	mg/kg	0.18	0.14
Selenium	mg/kg	3.9	0.96
Silver	mg/kg	2	0.15
Zinc	mg/kg	109	72.7

PE-35-SO-03			
Analyte	Units	Soil Screening Criteria	Result
Antimony	mg/kg	0.27	0.16
Arsenic	mg/kg	13	5.2
Barium	mg/kg	433	49.3
Cadmium	mg/kg	4	0.1
Chromium	mg/kg	41	18.3
Cobalt	mg/kg	13	10.6
Copper	mg/kg	50	14.6
Lead	mg/kg	63	17.8
Mercury	mg/kg	0.18	0.025
Selenium	mg/kg	3.9	0.34
Silver	mg/kg	2	0.022
Zinc	mg/kg	109	52.6

PE-35-SO-02			
Analyte	Units	Soil Screening Criteria	Result
Antimony	mg/kg	0.27	0.23
Arsenic	mg/kg	13	7.1
Barium	mg/kg	433	89.4
Cadmium	mg/kg	4	0.26
Chromium	mg/kg	41	16.7
Cobalt	mg/kg	13	10.3
Copper	mg/kg	50	22.9
Lead	mg/kg	63	21.8
Mercury	mg/kg	0.18	0.089
Selenium	mg/kg	3.9	0.53
Silver	mg/kg	2	0.071
Zinc	mg/kg	109	61.7

PE-35-SO-01			
Analyte	Units	Soil Screening Criteria	Result
Antimony	mg/kg	0.27	0.31
Arsenic	mg/kg	13	5.6
Barium	mg/kg	433	73.9
Cadmium	mg/kg	4	11.8
Chromium	mg/kg	41	16.6
Cobalt	mg/kg	13	10.1
Copper	mg/kg	50	40.7
Lead	mg/kg	63	41.2
Mercury	mg/kg	0.18	0.091
Selenium	mg/kg	3.9	0.76
Silver	mg/kg	2	0.065
Zinc	mg/kg	109	62.9

Q:\GIS_Data\HERCULES\Projects\Figure 13 SWMU 35 Surficial Soil Sampling Locs.mxd

Legend

- SWMU 35 SOIL SAMPLES
- APPROXIMATE SWMU/AOC BOUNDARY
- SWMU 1/22 BOUNDARY
- APPROXIMATE SITE BOUNDARY
- CONTOUR INTERVAL (5 Feet)

N

FIGURE 2-13

SWMU 35 SURFICIAL SOIL SAMPLING LOCATIONS

FWIA STEP IIC INVESTIGATION
DYNO NOBEL PORT EWEN SITE
PORT EWEN, NEW YORK

Map Source:
Image: NYSGIS (2004)
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support consider it done

Legend

- APPROXIMATE SWMU/AOC BOUNDARY
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE PROPERTY BOUNDARY
- SWMU 1/22 BOUNDARY
- LAKE/POND
- SWAMP/MARSH
- NYSDEC MAPPED CLASS 2 WETLANDS
- NYSDEC MAPPED CLASS 3 WETLANDS
- PERENNIAL STREAM
- INTERMITTENT STREAM
- ARTIFICIAL PATH
- CONNECTOR
- RAILROAD

N

FIGURE 2-14. SWMUs & AOCs REQUIRING A CMS

DYNO NOBEL SITE
PORT EWEN, NEW YORK

Map Source:
Fresh water wetlands: New York State Department of Environmental Conservation
Surface water: National Hydrography Dataset
Countours: United States Department of Agriculture/Natural Resource Conservation Service - National Cartography and Geospatial Center digital elevation models
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support consider it done

PE-DRN-SD-02					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.57	0.37	0.37	0.13
Arsenic	MG/KG	7.4	6.4	6.4	3.9
Barium	MG/KG	156	121	196	159
Cadmium	MG/KG	7.5	3.9	1	0.41
Chromium	MG/KG	23.2	16.7	25.7	23.5
Cobalt	MG/KG	11.1	7.6	9.4	8.4
Copper	MG/KG	794	582	63.9	27.7
Lead	MG/KG	159	108	47.6	23.1
Mercury	MG/KG	5.7	9	1.3	0.39
Selenium	MG/KG	24.3	9.1	3.3	2.2
Silver	MG/KG	0.36	0.19	0.19	0.13
Zinc	MG/KG	156	111	94.6	67.9

PE-DRN-SD-03					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.17	0.45	0.38	0.27
Arsenic	MG/KG	5.6	72.6	26	12.3
Barium	MG/KG	36.3	79.4	89.4	133
Cadmium	MG/KG	0.67	2.2	2.4	1
Chromium	MG/KG	5.8	12.4	8.9	19.6
Cobalt	MG/KG	3.3	6.4	5.9	10.3
Copper	MG/KG	89.9	189	115	213
Lead	MG/KG	36.7	51.2	28	64.2
Mercury	MG/KG	2.2	2.2	1	29.4
Selenium	MG/KG	7.6	29.6	37.9	14.6
Silver	MG/KG	0.62	0.47	0.49	0.36
Zinc	MG/KG	107	1770	854	315

PE-DRN-SD-04					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.13	0.11	0.063	0.061
Arsenic	MG/KG	3.1	2.9	2.4	1.5
Barium	MG/KG	161	133	152	140
Cadmium	MG/KG	0.41	0.3	0.34	0.26
Chromium	MG/KG	25.8	21.9	22.3	20
Cobalt	MG/KG	10.7	9.7	8.8	8.8
Copper	MG/KG	44.2	69.8	23.7	36.9
Lead	MG/KG	21.1	18.4	18.3	17.9
Mercury	MG/KG	1.6	1.9	0.57	0.25
Selenium	MG/KG	2.2	1.9	2.2	1.1
Silver	MG/KG	0.18	0.26	0.16	0.16
Zinc	MG/KG	103	80.7	76.5	73.4

PE-DRN-SD-01					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.41	0.31	0.26	0.29
Arsenic	MG/KG	9.5	8.3	6.9	7.9
Barium	MG/KG	96.5	88.2	86.1	94.5
Cadmium	MG/KG	2.1	0.51	0.34	0.27
Chromium	MG/KG	18.6	19.6	19	20.4
Cobalt	MG/KG	16.4	15.2	13.9	13.8
Copper	MG/KG	125	99.2	72.7	53.1
Lead	MG/KG	48.5	40.2	91.3	30.3
Mercury	MG/KG	21.5	9.3	5.3	5.5
Selenium	MG/KG	2.2	1.4	0.94	0.76
Silver	MG/KG	0.054	0.046	0.039	0.04
Zinc	MG/KG	69.9	69.3	65.4	68.3

PE-DRN-SD-05					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.59	0.13	0.095	0.1
Arsenic	MG/KG	5.2	4	3.3	2.3
Barium	MG/KG	187	165	163	195
Cadmium	MG/KG	2.2	0.6	0.56	0.53
Chromium	MG/KG	23.8	24.6	22.7	24
Cobalt	MG/KG	10.4	9.8	9.1	9.4
Copper	MG/KG	349	42.5	31.6	35.3
Lead	MG/KG	71.6	22.9	21.1	21
Mercury	MG/KG	10.7	0.81	0.46	0.36
Selenium	MG/KG	26.5	3.3	3.3	3
Silver	MG/KG	27.1	0.87	1.1	1.3
Zinc	MG/KG	277	118	91.1	88

PE-DRN-SD-06					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.5	0.66	0.47	0.43
Arsenic	MG/KG	13.1	15.4	13.5	12.2
Barium	MG/KG	166	207	165	150
Cadmium	MG/KG	1.9	5.2	2	1.5
Chromium	MG/KG	19	20.1	17.7	16.1
Cobalt	MG/KG	10.4	12.7	10.6	9.3
Copper	MG/KG	2240	4870	2700	3660
Lead	MG/KG	209	356	212	211
Mercury	MG/KG	24.2	34.3	31.1	73.6
Selenium	MG/KG	9.3	16.1	9.6	9.3
Silver	MG/KG	0.31	0.56	0.3	0.25
Zinc	MG/KG	1030	1410	1200	874

PE-DRN-SD-09					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.091	0.12	0.19	0.19
Arsenic	MG/KG	1.3	2.9	5.7	8.4
Barium	MG/KG	101	83.2	97.8	82.6
Cadmium	MG/KG	0.21	0.23	0.31	0.27
Chromium	MG/KG	18.2	16.7	19.5	18.6
Cobalt	MG/KG	11.6	10.3	13.2	11.9
Copper	MG/KG	41.7	48	35.2	35.4
Lead	MG/KG	19	25.3	21.8	21.1
Mercury	MG/KG	8	4.6	1.4	1.3
Selenium	MG/KG	0.63	0.87	0.69	0.63
Silver	MG/KG	0.071	0.073	0.07	0.069
Zinc	MG/KG	65.8	69.7	74.6	74.9

PE-DRN-SD-07					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.5	0.86	1.5	0.44
Arsenic	MG/KG	18	15.4	15.5	10.3
Barium	MG/KG	394	382	307	172
Cadmium	MG/KG	4	4	4.1	1.6
Chromium	MG/KG	23.6	22.3	30.4	20.4
Cobalt	MG/KG	12.6	11.4	12.3	8.8
Copper	MG/KG	6660	6550	5360	6940
Lead	MG/KG	285	232	235	205
Mercury	MG/KG	22.7	18.8	15.4	27.3
Selenium	MG/KG	17.9	12.7	15.7	6.7
Silver	MG/KG	0.85	0.4	0.34	0.3
Zinc	MG/KG	1770	1370	1120	733

PE-DRN-SD-10					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.12	0.11	0.15	0.31
Arsenic	MG/KG	3.1	3.3	5.2	7.8
Barium	MG/KG	108	104	97.2	95.7
Cadmium	MG/KG	0.23	0.17	0.2	0.25
Chromium	MG/KG	16.8	16.7	20.7	22
Cobalt	MG/KG	8.7	10	12	13.9
Copper	MG/KG	15.8	14.5	24.1	26.5
Lead	MG/KG	23.8	17.4	16.1	19.5
Mercury	MG/KG	2.8	0.28	0.12	0.12
Selenium	MG/KG	0.99	0.65	0.49	0.56
Silver	MG/KG	0.057	0.049	0.063	0.07
Zinc	MG/KG	75.3	58.8	72.3	77.5

PE-DRN-SD-08					
Analyte	Units	0.0'-0.05'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'
Antimony	MG/KG	0.61	1.2	0.67	0.23
Arsenic	MG/KG	46.3	90.4	69.2	7.7
Barium	MG/KG	121	167	153	114
Cadmium	MG/KG	2.4	4.6	2.2	0.54
Chromium	MG/KG	20.3	19.9	22	22.9
Cobalt	MG/KG	9.4	13.6	19.9	31.5
Copper	MG/KG	284	335	309	67.5
Lead	MG/KG	185	137	176	38.3
Mercury	MG/KG	4.6	6.1	114	6.5
Selenium	MG/KG	9.8	10.5	6.8	1.7
Silver	MG/KG	0.42	0.22	0.11	0.075
Zinc	MG/KG	317	571	700	178

Legend

- SWMU 1/22 BOUNDARY
- APPROXIMATE SWMU/AOC BOUNDARY
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE PROPERTY BOUNDARY
- NYSDEC MAPPED CLASS 2 WETLANDS
- NYSDEC MAPPED CLASS 3 WETLANDS
- SWAMP/MARSH
- SITE DRAINAGE SEDIMENT SAMPLES
- PERENNIAL STREAM
- INTERMITTENT STREAM
- ARTIFICIAL PATH
- CONNECTOR
- RAILROAD

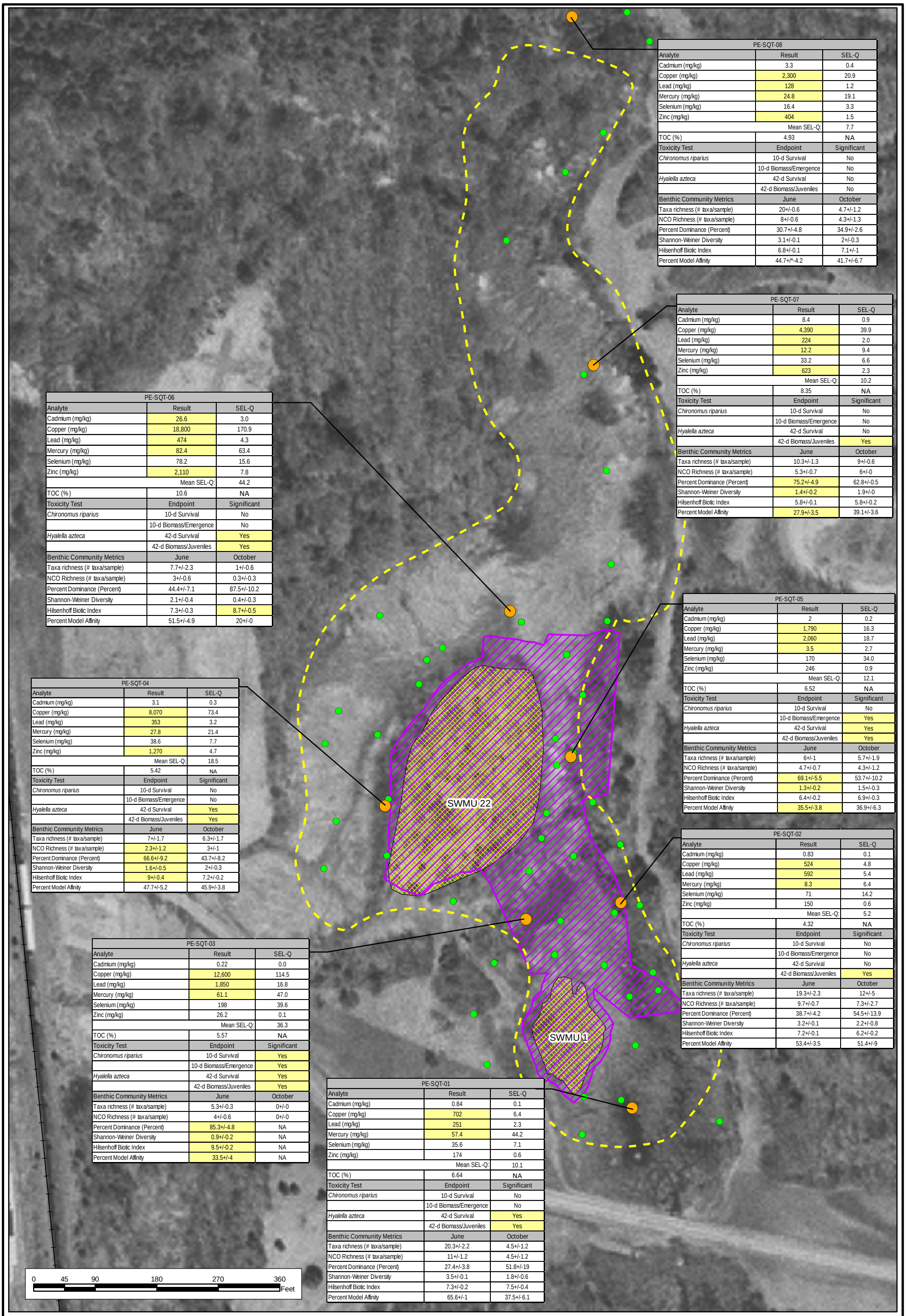
N

FIGURE 4-1 SITE DRAINAGE FEATURES SEDIMENT SAMPLING RESULTS

DYNO NOBEL SITE, PORT EWEN, NEW YORK

Map Source:
Fresh water wetlands: New York State Department of Environmental Conservation
Surface water: National Hydrography Dataset
Countours: United States Department of Agriculture/Natural Resource Conservation Service - National Cartography and Geospatial Center digital elevation models
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support consider it done



PE-SQT-08		
Analyte	Result	SEL-Q
Cadmium (mg/kg)	3.3	0.4
Copper (mg/kg)	2,300	20.9
Lead (mg/kg)	128	1.2
Mercury (mg/kg)	24.8	19.1
Selenium (mg/kg)	16.4	3.3
Zinc (mg/kg)	404	1.5
	Mean SEL-Q:	7.7
TOC (%)	4.93	NA
Toxicity Test	Endpoint	Significant
Chironomus riparius	10-d Survival	No
	10-d Biomass/Emergence	No
Hyalella azteca	42-d Survival	No
	42-d Biomass/Juveniles	No
Benthic Community Metrics	June	October
Taxa richness (# taxa/sample)	20+/-0.6	4.7+/-1.2
NCO Richness (# taxa/sample)	8+/-0.6	4.3+/-1.3
Percent Dominance (Percent)	30.7+/-4.8	34.9+/-2.6
Shannon-Weiner Diversity	3.1+/-0.1	2+/-0.3
Hilsenhoff Biotic Index	6.8+/-0.1	7.1+/-1
Percent Model Affinity	44.7+/*-4.2	41.7+/-6.7

PE-SQT-07		
Analyte	Result	SEL-Q
Cadmium (mg/kg)	8.4	0.9
Copper (mg/kg)	4,390	39.9
Lead (mg/kg)	224	2.0
Mercury (mg/kg)	12.2	9.4
Selenium (mg/kg)	33.2	6.6
Zinc (mg/kg)	623	2.3
	Mean SEL-Q:	10.2
TOC (%)	8.35	NA
Toxicity Test	Endpoint	Significant
Chironomus riparius	10-d Survival	No
	10-d Biomass/Emergence	No
Hyalella azteca	42-d Survival	No
	42-d Biomass/Juveniles	Yes
Benthic Community Metrics	June	October
Taxa richness (# taxa/sample)	10.3+/-1.3	9+/-0.6
NCO Richness (# taxa/sample)	5.3+/-0.7	6+/-0
Percent Dominance (Percent)	75.2+/-4.9	62.8+/-0.5
Shannon-Weiner Diversity	1.4+/-0.2	1.9+/-0
Hilsenhoff Biotic Index	5.8+/-0.1	5.8+/-0.2
Percent Model Affinity	27.9+/-3.5	39.1+/-3.6

PE-SQT-06		
Analyte	Result	SEL-Q
Cadmium (mg/kg)	26.6	3.0
Copper (mg/kg)	18,800	170.9
Lead (mg/kg)	474	4.3
Mercury (mg/kg)	82.4	63.4
Selenium (mg/kg)	78.2	15.6
Zinc (mg/kg)	2,110	7.8
	Mean SEL-Q:	44.2
TOC (%)	10.6	NA
Toxicity Test	Endpoint	Significant
Chironomus riparius	10-d Survival	No
	10-d Biomass/Emergence	No
Hyalella azteca	42-d Survival	Yes
	42-d Biomass/Juveniles	Yes
Benthic Community Metrics	June	October
Taxa richness (# taxa/sample)	7.7+/-2.3	1+/-0.6
NCO Richness (# taxa/sample)	3+/-0.6	0.3+/-0.3
Percent Dominance (Percent)	44.4+/-7.1	87.5+/-10.2
Shannon-Weiner Diversity	2.1+/-0.4	0.4+/-0.3
Hilsenhoff Biotic Index	7.3+/-0.3	8.7+/-0.5
Percent Model Affinity	51.5+/-4.9	20+/-0

PE-SQT-05		
Analyte	Result	SEL-Q
Cadmium (mg/kg)	2	0.2
Copper (mg/kg)	1,790	16.3
Lead (mg/kg)	2,060	18.7
Mercury (mg/kg)	3.5	2.7
Selenium (mg/kg)	170	34.0
Zinc (mg/kg)	246	0.9
	Mean SEL-Q:	12.1
TOC (%)	6.52	NA
Toxicity Test	Endpoint	Significant
Chironomus riparius	10-d Survival	No
	10-d Biomass/Emergence	Yes
Hyalella azteca	42-d Survival	Yes
	42-d Biomass/Juveniles	Yes
Benthic Community Metrics	June	October
Taxa richness (# taxa/sample)	6+/-1	5.7+/-1.9
NCO Richness (# taxa/sample)	4.7+/-0.7	4.3+/-1.2
Percent Dominance (Percent)	69.1+/-5.5	53.7+/-10.2
Shannon-Weiner Diversity	1.3+/-0.2	1.5+/-0.3
Hilsenhoff Biotic Index	6.4+/-0.2	6.9+/-0.3
Percent Model Affinity	35.5+/-3.8	36.9+/-6.3

PE-SQT-04		
Analyte	Result	SEL-Q
Cadmium (mg/kg)	3.1	0.3
Copper (mg/kg)	8,070	73.4
Lead (mg/kg)	353	3.2
Mercury (mg/kg)	27.8	21.4
Selenium (mg/kg)	38.6	7.7
Zinc (mg/kg)	1,270	4.7
	Mean SEL-Q:	18.5
TOC (%)	5.42	NA
Toxicity Test	Endpoint	Significant
Chironomus riparius	10-d Survival	No
	10-d Biomass/Emergence	No
Hyalella azteca	42-d Survival	Yes
	42-d Biomass/Juveniles	Yes
Benthic Community Metrics	June	October
Taxa richness (# taxa/sample)	7+/-1.7	6.3+/-1.7
NCO Richness (# taxa/sample)	2.3+/-1.2	3+/-1
Percent Dominance (Percent)	66.6+/-9.2	43.7+/-8.2
Shannon-Weiner Diversity	1.6+/-0.5	2+/-0.3
Hilsenhoff Biotic Index	9+/-0.4	7.2+/-0.2
Percent Model Affinity	47.7+/-5.2	45.9+/-3.8

PE-SQT-02		
Analyte	Result	SEL-Q
Cadmium (mg/kg)	0.83	0.1
Copper (mg/kg)	524	4.8
Lead (mg/kg)	592	5.4
Mercury (mg/kg)	8.3	6.4
Selenium (mg/kg)	71	14.2
Zinc (mg/kg)	150	0.6
	Mean SEL-Q:	5.2
TOC (%)	4.32	NA
Toxicity Test	Endpoint	Significant
Chironomus riparius	10-d Survival	No
	10-d Biomass/Emergence	No
Hyalella azteca	42-d Survival	No
	42-d Biomass/Juveniles	Yes
Benthic Community Metrics	June	October
Taxa richness (# taxa/sample)	19.3+/-2.3	12+/-5
NCO Richness (# taxa/sample)	9.7+/-0.7	7.3+/-2.7
Percent Dominance (Percent)	38.7+/-4.2	54.5+/-13.9
Shannon-Weiner Diversity	3.2+/-0.1	2.2+/-0.8
Hilsenhoff Biotic Index	7.2+/-0.1	6.2+/-0.2
Percent Model Affinity	53.4+/-3.5	51.4+/-9

PE-SQT-03		
Analyte	Result	SEL-Q
Cadmium (mg/kg)	0.22	0.0
Copper (mg/kg)	12,600	114.5
Lead (mg/kg)	1,850	16.8
Mercury (mg/kg)	61.1	47.0
Selenium (mg/kg)	198	39.6
Zinc (mg/kg)	26.2	0.1
	Mean SEL-Q:	36.3
TOC (%)	5.57	NA
Toxicity Test	Endpoint	Significant
Chironomus riparius	10-d Survival	Yes
	10-d Biomass/Emergence	Yes
Hyalella azteca	42-d Survival	Yes
	42-d Biomass/Juveniles	Yes
Benthic Community Metrics	June	October
Taxa richness (# taxa/sample)	5.3+/-0.3	0+/-0
NCO Richness (# taxa/sample)	4+/-0.6	0+/-0
Percent Dominance (Percent)	85.3+/-4.8	NA
Shannon-Weiner Diversity	0.9+/-0.2	NA
Hilsenhoff Biotic Index	9.5+/-0.2	NA
Percent Model Affinity	33.5+/-4	NA

PE-SQT-01		
Analyte	Result	SEL-Q
Cadmium (mg/kg)	0.84	0.1
Copper (mg/kg)	702	6.4
Lead (mg/kg)	251	2.3
Mercury (mg/kg)	57.4	44.2
Selenium (mg/kg)	35.6	7.1
Zinc (mg/kg)	174	0.6
	Mean SEL-Q:	10.1
TOC (%)	6.64	NA
Toxicity Test	Endpoint	Significant
Chironomus riparius	10-d Survival	No
	10-d Biomass/Emergence	No
Hyalella azteca	42-d Survival	Yes
	42-d Biomass/Juveniles	Yes
Benthic Community Metrics	June	October
Taxa richness (# taxa/sample)	20.3+/-2.2	4.5+/-1.2
NCO Richness (# taxa/sample)	11+/-1.2	4.5+/-1.2
Percent Dominance (Percent)	27.4+/-3.8	51.8+/-19
Shannon-Weiner Diversity	3.5+/-0.1	1.8+/-0.6
Hilsenhoff Biotic Index	7.3+/-0.2	7.5+/-0.4
Percent Model Affinity	65.6+/-1	37.5+/-6.1

Legend

- SQT SEDIMENT SAMPLING STATION
- HISTORIC SEDIMENT SAMPLE LOCATION
- APPROXIMATE SWMU/AOC BOUNDARY
- SWMU 1/22 BOUNDARY
- APPROXIMATE EXTENT OF REMEDIAL BOUNDARY PROPOSED IN 2006 CMS
- RAILROAD

N

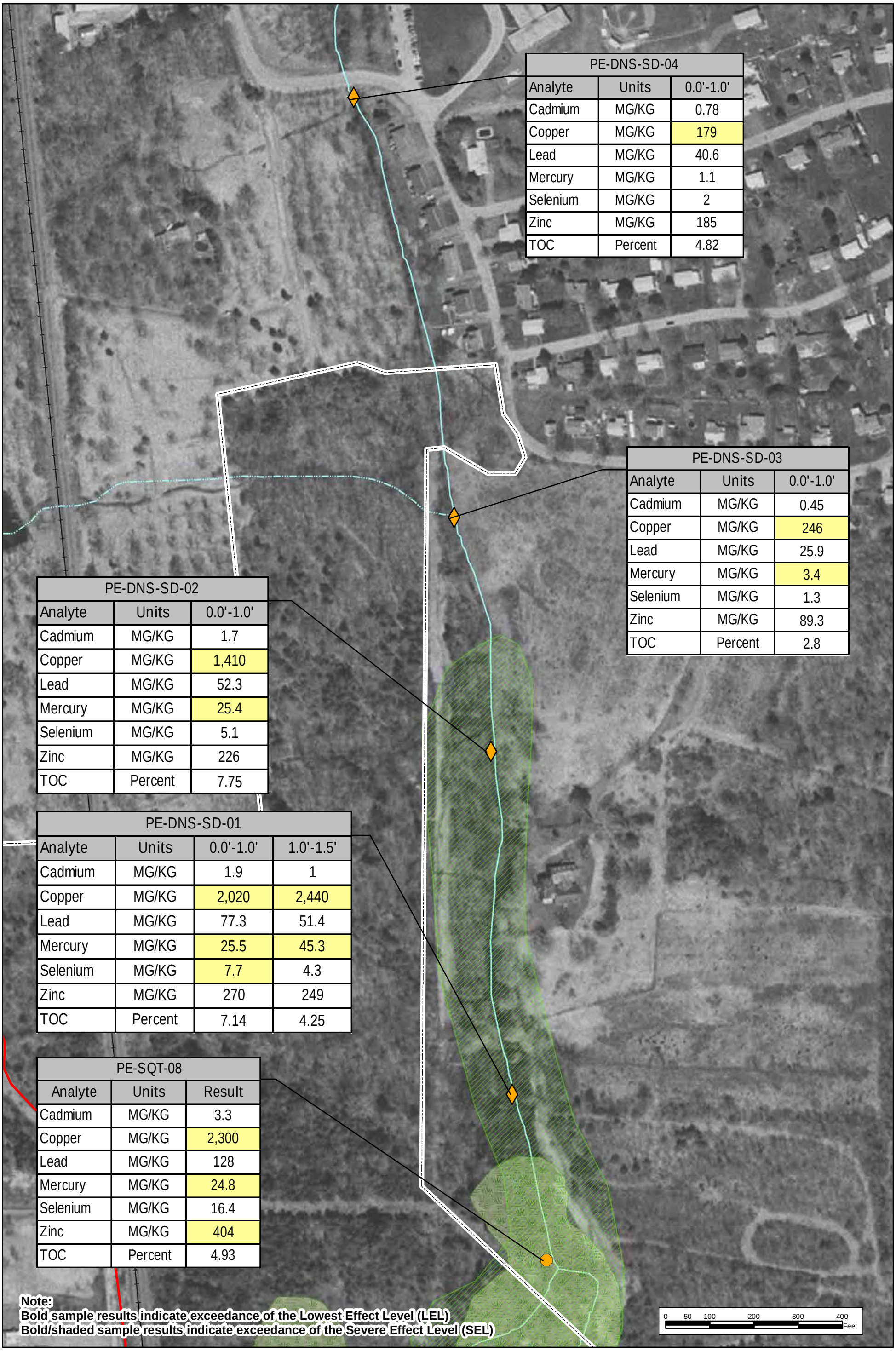
Note: All concentrations are represented as mg/kg. Bold sediment concentrations indicate an exceedance of the LEL; shaded concentrations indicate an exceedance of the SEL; Shaded sediment toxicity testing and benthic community results indicate statistical significance relevant to reference stations.

FIGURE 4-2. SEDIMENT QUALITY TRIAD SAMPLING LOCATIONS
SWMU 1/22 WETLAND COMPLEX

DYNO NOBEL SITE, PORT EWEN, NEW YORK

Map Source:
Image: NYSGIS (2004)
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support *consider it done*



PE-DNS-SD-04		
Analyte	Units	0.0'-1.0'
Cadmium	MG/KG	0.78
Copper	MG/KG	179
Lead	MG/KG	40.6
Mercury	MG/KG	1.1
Selenium	MG/KG	2
Zinc	MG/KG	185
TOC	Percent	4.82

PE-DNS-SD-03		
Analyte	Units	0.0'-1.0'
Cadmium	MG/KG	0.45
Copper	MG/KG	246
Lead	MG/KG	25.9
Mercury	MG/KG	3.4
Selenium	MG/KG	1.3
Zinc	MG/KG	89.3
TOC	Percent	2.8

PE-DNS-SD-02		
Analyte	Units	0.0'-1.0'
Cadmium	MG/KG	1.7
Copper	MG/KG	1,410
Lead	MG/KG	52.3
Mercury	MG/KG	25.4
Selenium	MG/KG	5.1
Zinc	MG/KG	226
TOC	Percent	7.75

PE-DNS-SD-01			
Analyte	Units	0.0'-1.0'	1.0'-1.5'
Cadmium	MG/KG	1.9	1
Copper	MG/KG	2,020	2,440
Lead	MG/KG	77.3	51.4
Mercury	MG/KG	25.5	45.3
Selenium	MG/KG	7.7	4.3
Zinc	MG/KG	270	249
TOC	Percent	7.14	4.25

PE-SQT-08		
Analyte	Units	Result
Cadmium	MG/KG	3.3
Copper	MG/KG	2,300
Lead	MG/KG	128
Mercury	MG/KG	24.8
Selenium	MG/KG	16.4
Zinc	MG/KG	404
TOC	Percent	4.93

Note:
Bold sample results indicate exceedance of the Lowest Effect Level (LEL)
Bold/shaded sample results indicate exceedance of the Severe Effect Level (SEL)

Legend

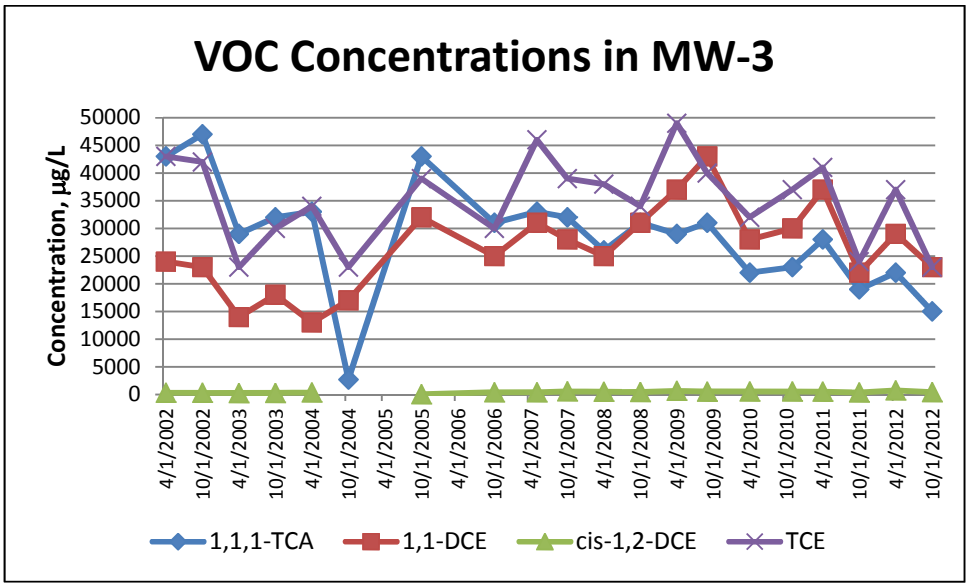
- New Sediment Sample Location
- SQT STATION
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE SITE BOUNDARY
- SWAMP/MARSH
- NYSDEC MAPPED CLASS 2 WETLANDS
- NYSDEC MAPPED CLASS 3 WETLANDS
- INTERMITTENT STREAM
- PERENNIAL STREAM
- RAILROAD

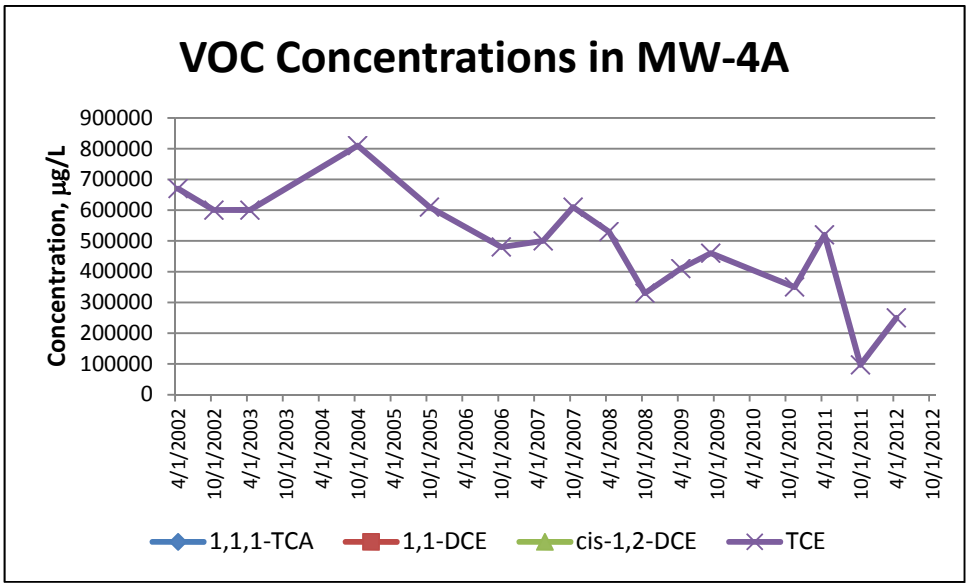
N

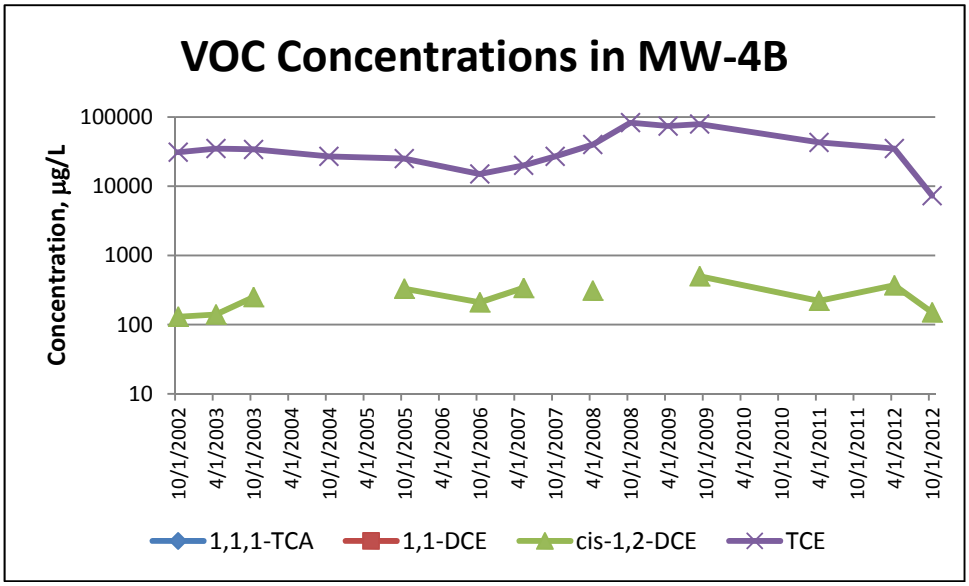
FIGURE 4-3. DOWNSTREAM SEDIMENT SAMPLING STATIONS
SWMU 1/22 WETLAND COMPLEX
DYNO NOBEL SITE, PORT EWEN, NEW YORK

Map Source:
Fresh water wetlands: New York State Department of Environmental Conservation
Surface water: National Hydrography Dataset
Countours: United States Department of Agriculture/Natural Resource Conservation Service - National Cartography and Geospatial Center digital elevation models
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support consider it done







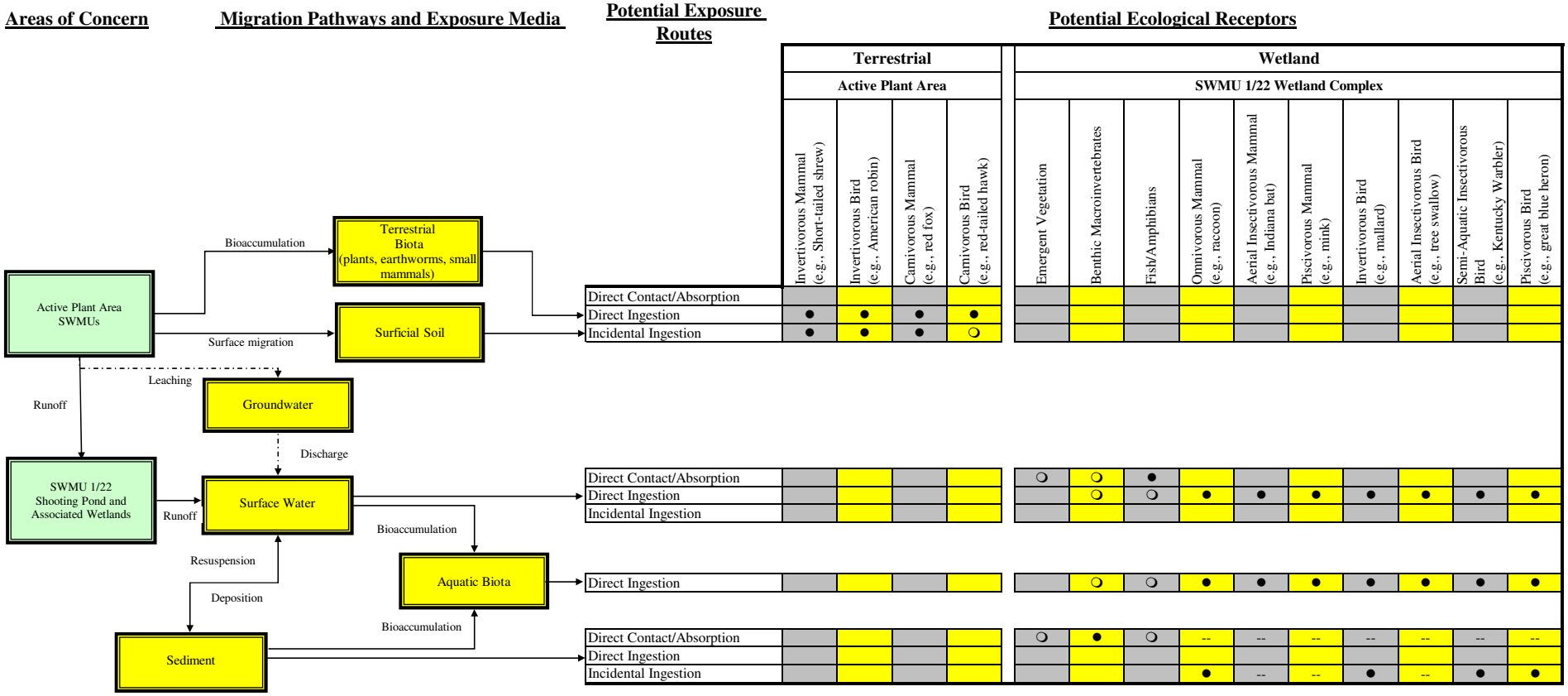
EHS Support consider it done

VOLATILE ORGANIC COMPOUND (VOC) TRENDS IN SHELL PLANT GROUNDWATER
DYNO NOBEL SITE
PORT EWEN, NEW YORK

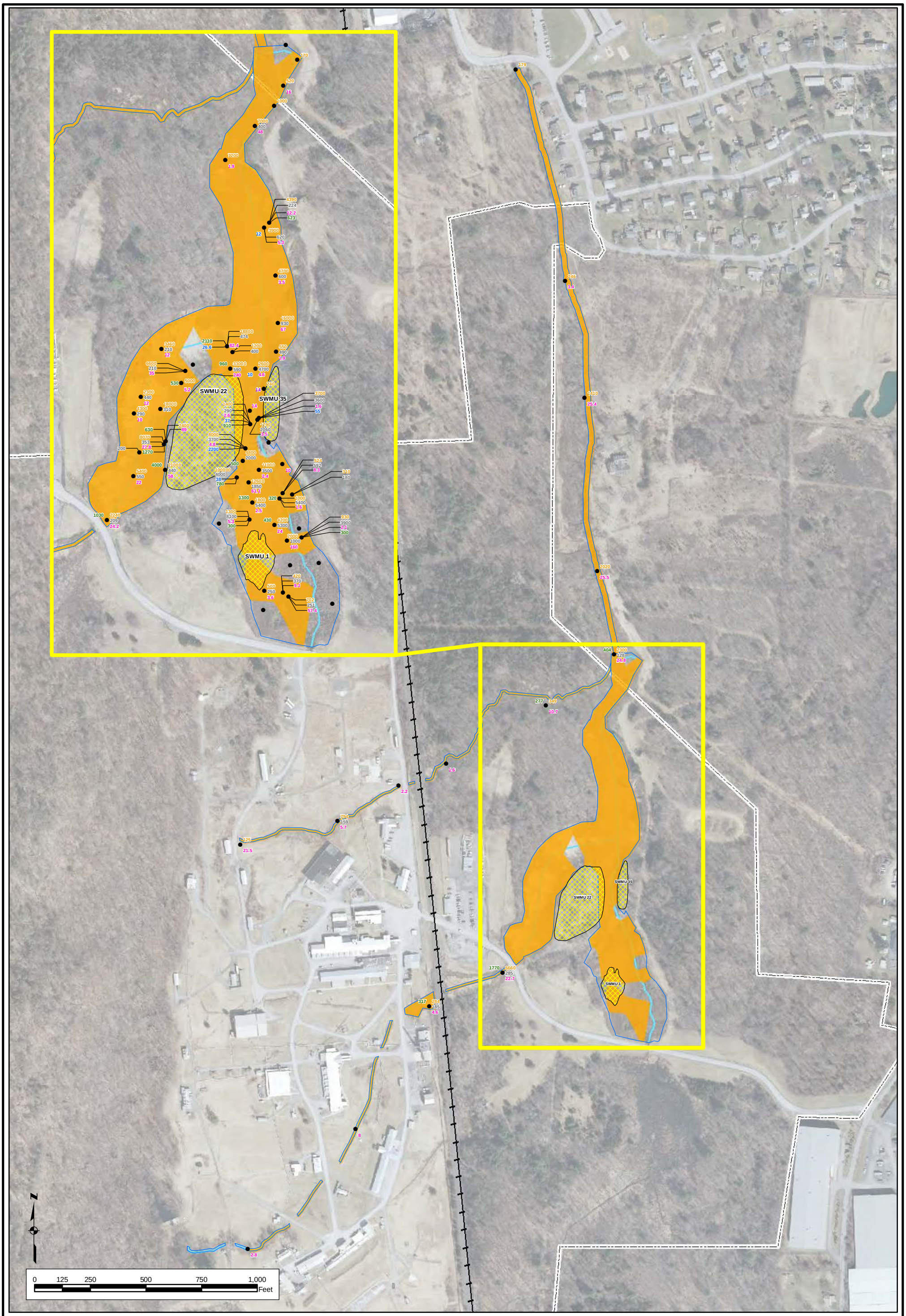
FIGURE 4-4

FIGURE 6-1
ECOLOGICAL CONCEPTUAL SITE MODEL

DYNO NOBEL SITE
PORT EWEN, NEW YORK



Notes:
→ CONTAMINANT MIGRATION PATHWAY
⋯→ LIMITED OR INSIGNIFICANT CONTAMINANT MIGRATION PATHWAY
● PRIMARY EXPOSURE PATHWAY: EVALUATED QUANTITATIVELY
❍ SECONDARY EXPOSURE PATHWAY: EVALUATED QUALITATIVELY
-- EXPOSURE PATHWAY IS INSIGNIFICANT
BLANK = INCOMPLETE EXPOSURE PATHWAY



Legend

- SURFACE SEDIMENT SAMPLE
- SEL EXCEEDANCE (447,043.40 SqFt)
- SEDIMENT STUDY AREA
- APPROXIMATE SWMU/AOC BOUNDARY
- EST. SURFACE WATER
- SURFACE WATER
- APPROXIMATE PROPERTY BOUNDARY
- RAILROAD

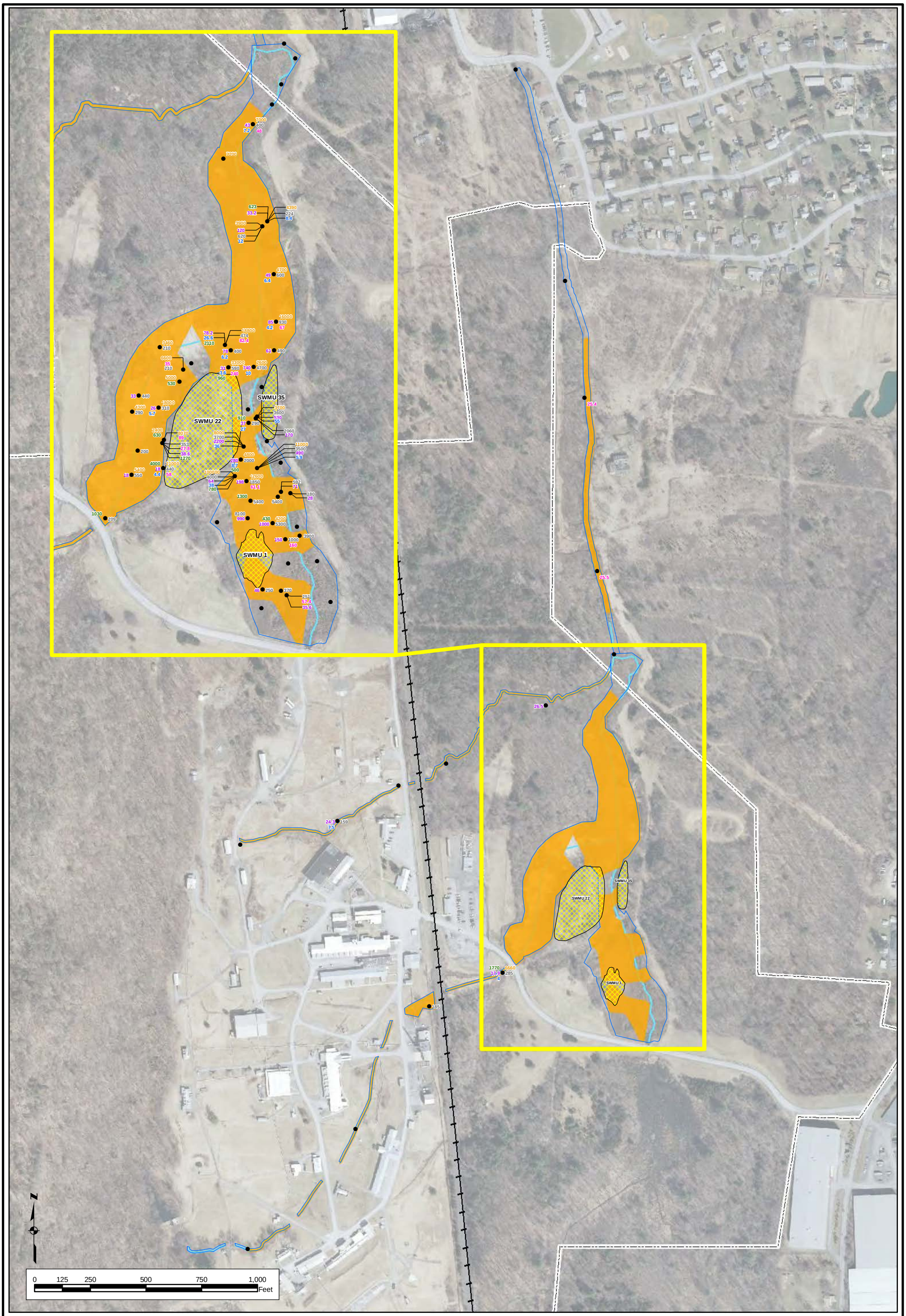
Values represent concentrations of metals (mg/kg) exceeding the SEL, as indicated by the following colors:

Copper
Lead
Mercury
Cadmium
Zinc

FIGURE 9-1
SEVERE EFFECTS LEVEL (SEL) EXCEEDANCES IN SURFACE SEDIMENT
DYNO NOBEL SITE
PORT EWEN, NEW YORK

Map Source:
Image: NYSGIS (2009)
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support consider it done



Legend

- SURFACE SEDIMENT SAMPLE
- PRG EXCEEDANCE (380,741.45 SqFt)
- SEDIMENT STUDY AREA
- APPROXIMATE SWMU/AOC BOUNDARY
- EST. SURFACE WATER
- SURFACE WATER
- APPROXIMATE PROPERTY BOUNDARY
- RAILROAD

Values represent concentrations of metals (mg/kg) exceeding the PRG, as indicated by the following colors:

- Copper
- Lead
- Mercury
- Cadmium
- Selenium
- Zinc

FIGURE 9-2

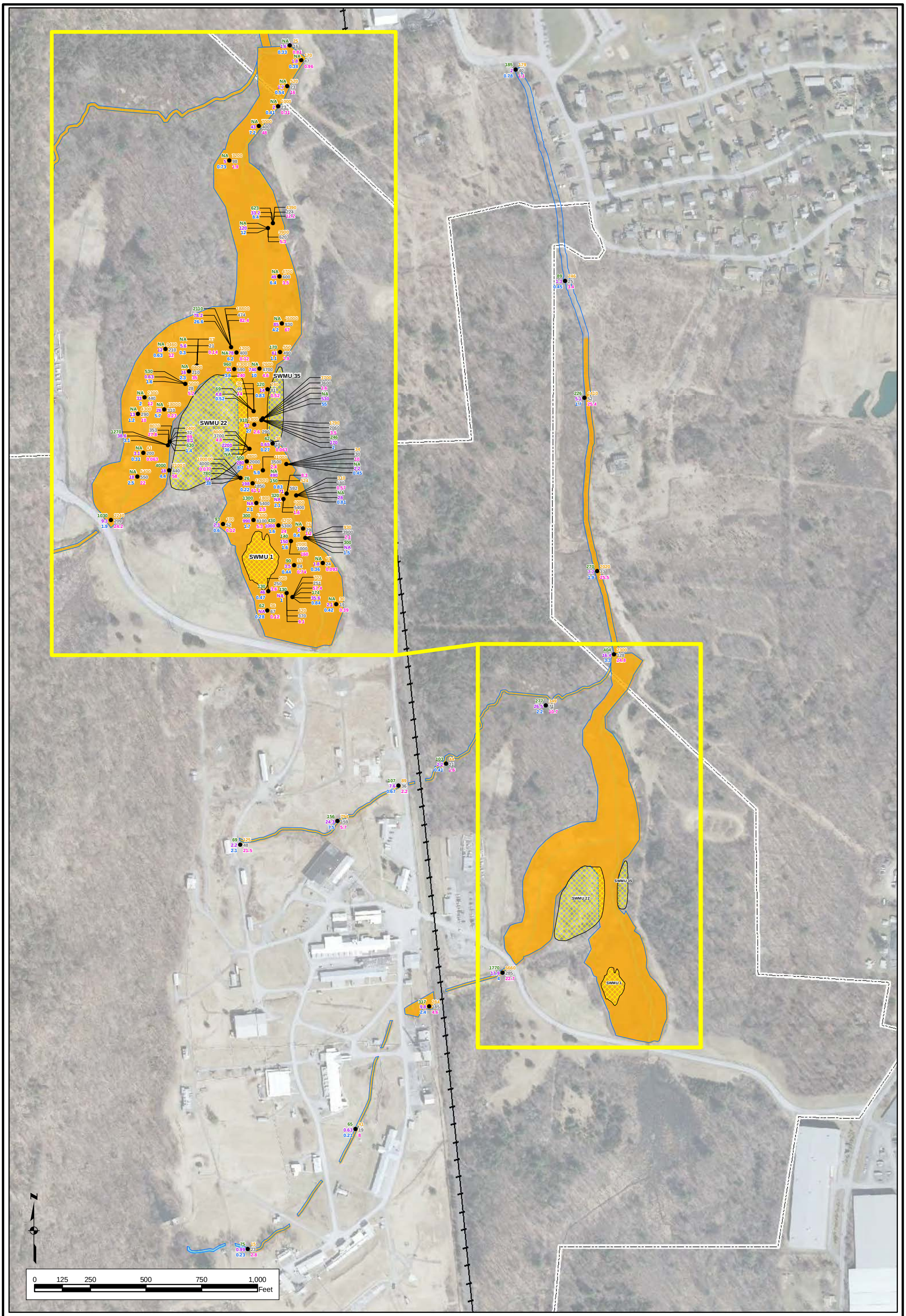
PROPOSED REMEDIATION GOASL (PRG) EXCEEDANCES IN SURFACE SEDIMENT

DYNO NOBEL SITE

PORT EWEN, NEW YORK

Map Source:
Image: NYSGIS (2009)
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support consider it done



Legend

- SURFACE SEDIMENT SAMPLE
- MASS REMOVAL (481,378.34 SqFt)
- SEDIMENT STUDY AREA
- APPROXIMATE SWMU/AOC BOUNDARY
- EST. SURFACE WATER
- SURFACE WATER
- APPROXIMATE PROPERTY BOUNDARY
- RAILROAD

Values represent concentrations of metals (mg/kg), as indicated by the following colors:

Copper
Lead
Mercury
Cadmium
Selenium
Zinc
NA = Not Analyzed

FIGURE 9-3
EXTENT OF IMPACTED SURFACE SEDIMENT BASED ON MASS REMOVAL
DYNO NOBEL SITE
PORT EWEN, NEW YORK

Map Source:
Image: NYSGIS (2009)
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

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Legend

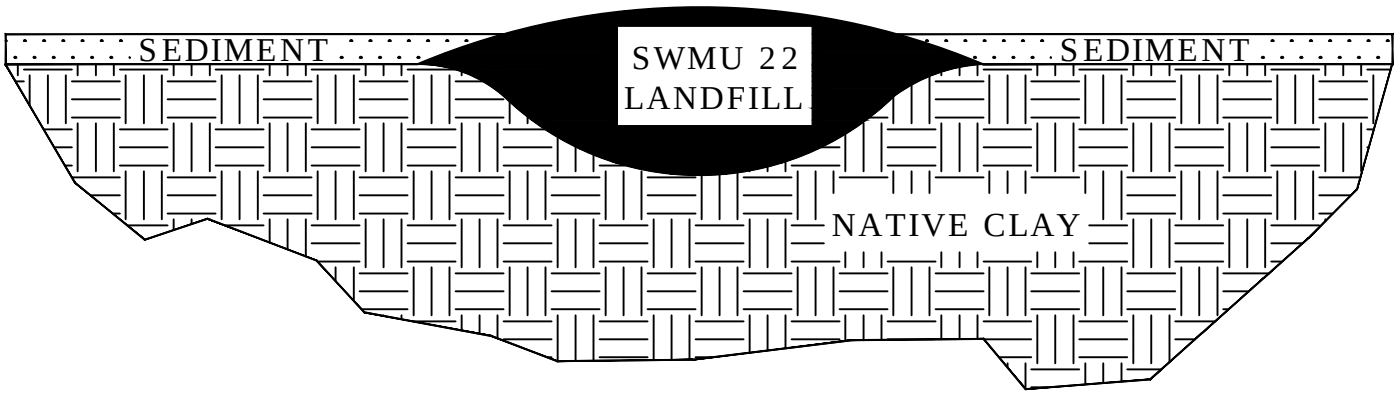
- SURFACE WATER SAMPLING STATION
- SQT SEDIMENT SAMPLING STATION
- SWMU 1/22 BOUNDARY
- PERMANENT REALIGNED STREAM
- FISH SAMPLING REACH
- APPROXIMATE SWMU/AOC BOUNDARY
- TEMPORARY STREAM
- PERENNIAL STREAM
- INTERMITTENT STREAM
- CONNECTOR
- ARTIFICIAL PATH

N

FIGURE 11-1
CONCEPTUAL STREAM REALIGNMENT
DYNO NOBEL PORT EWEN SITE
PORT EWEN, NEW YORK

Map Source:
Image: NYSGIS (2004)
Boundaries: Site and property boundaries approximations were determined using available data from historical maps and CAD files.

EHS Support consider it done



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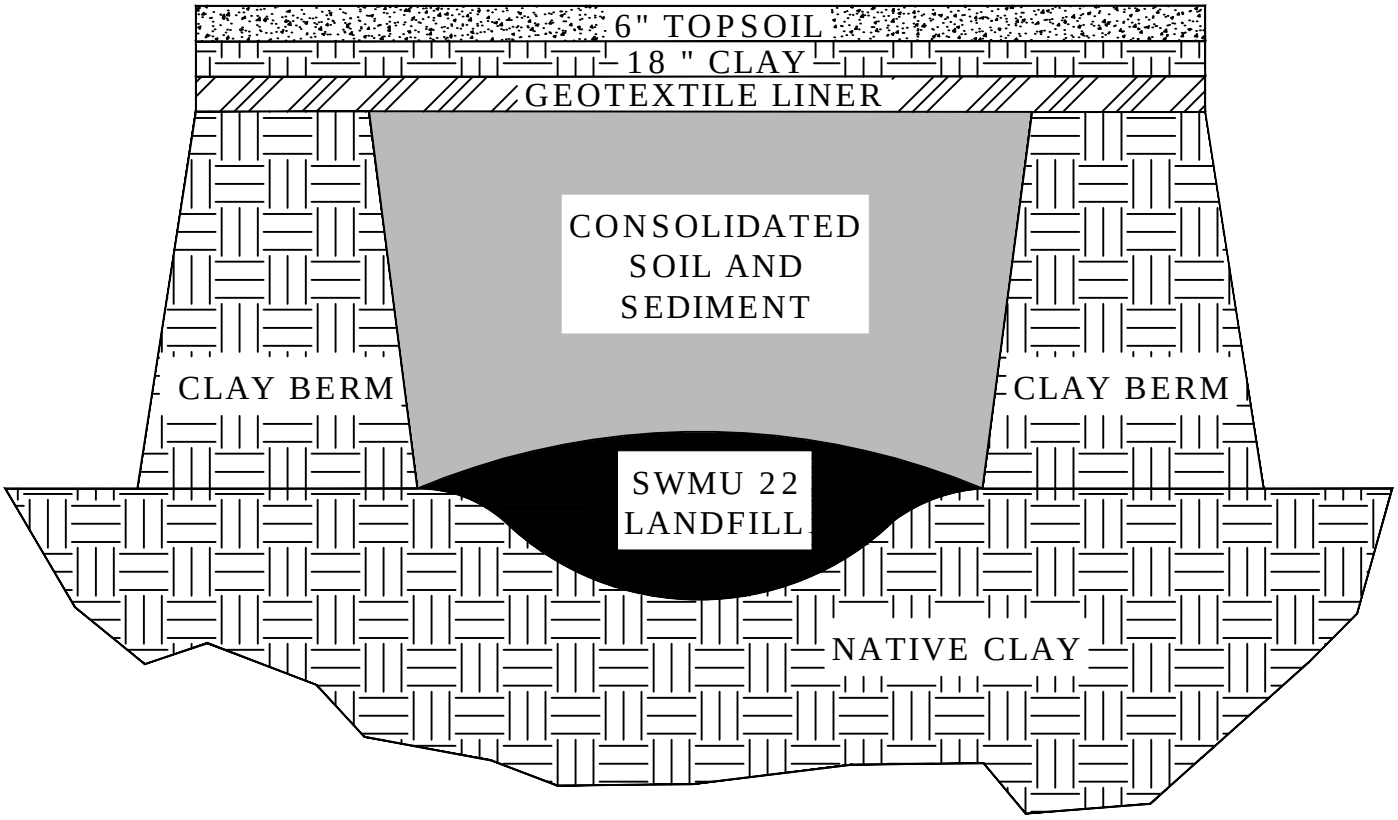
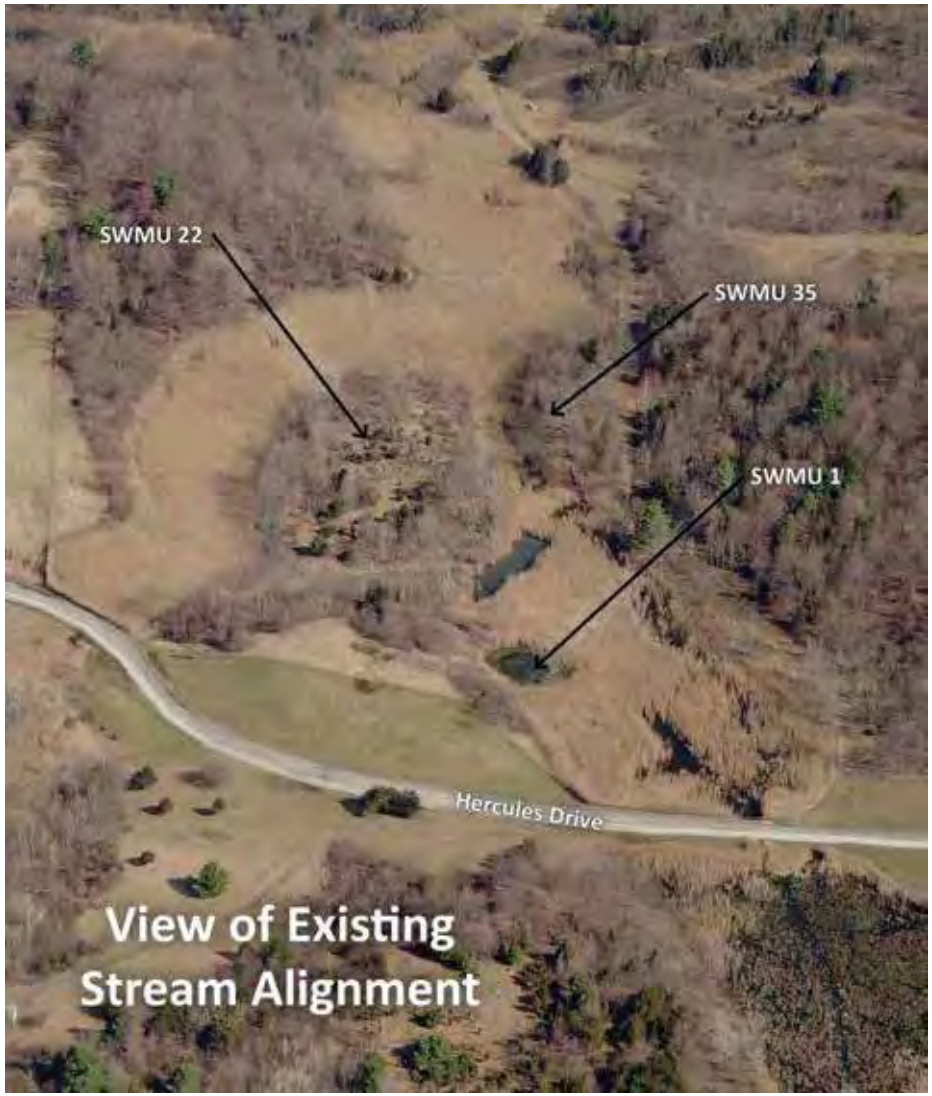


PROPOSED

EHS Support consider it done	DYNO-NOBEL, INC. PORT EWEN, NY.	**FIGURE 11-2** **TYPICAL CROSS SECTION OF CONCEPTUAL CONSOLIDATION UNIT**	Drawn By: BC	Date Drawn: 01/09/14
			Reviewed By: KV	Date Reviewed: 01/2014
			Scale: NTS	Plot Date: 01/2014
			Project Number.:	



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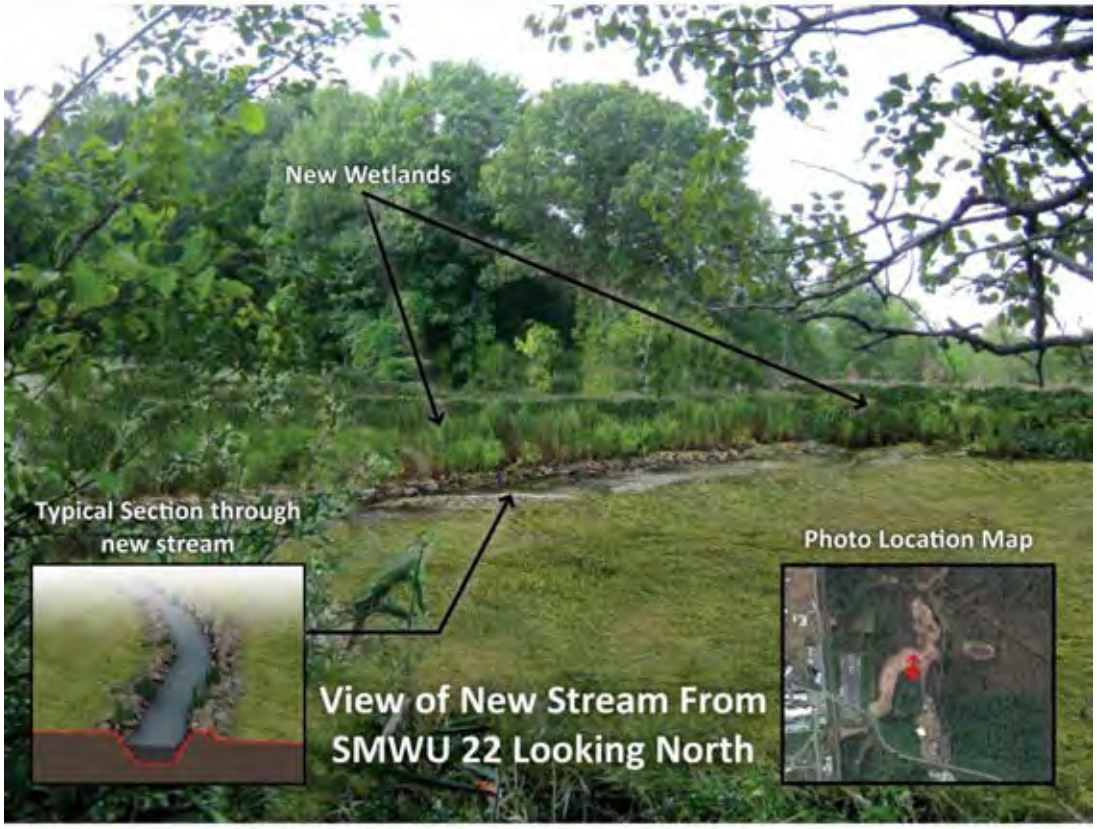
CONCEPTUAL LOOK AT ON-SITE CONSOLIDATION UNIT
DYNO NOBEL SITE
PORT EWEN, NEW YORK

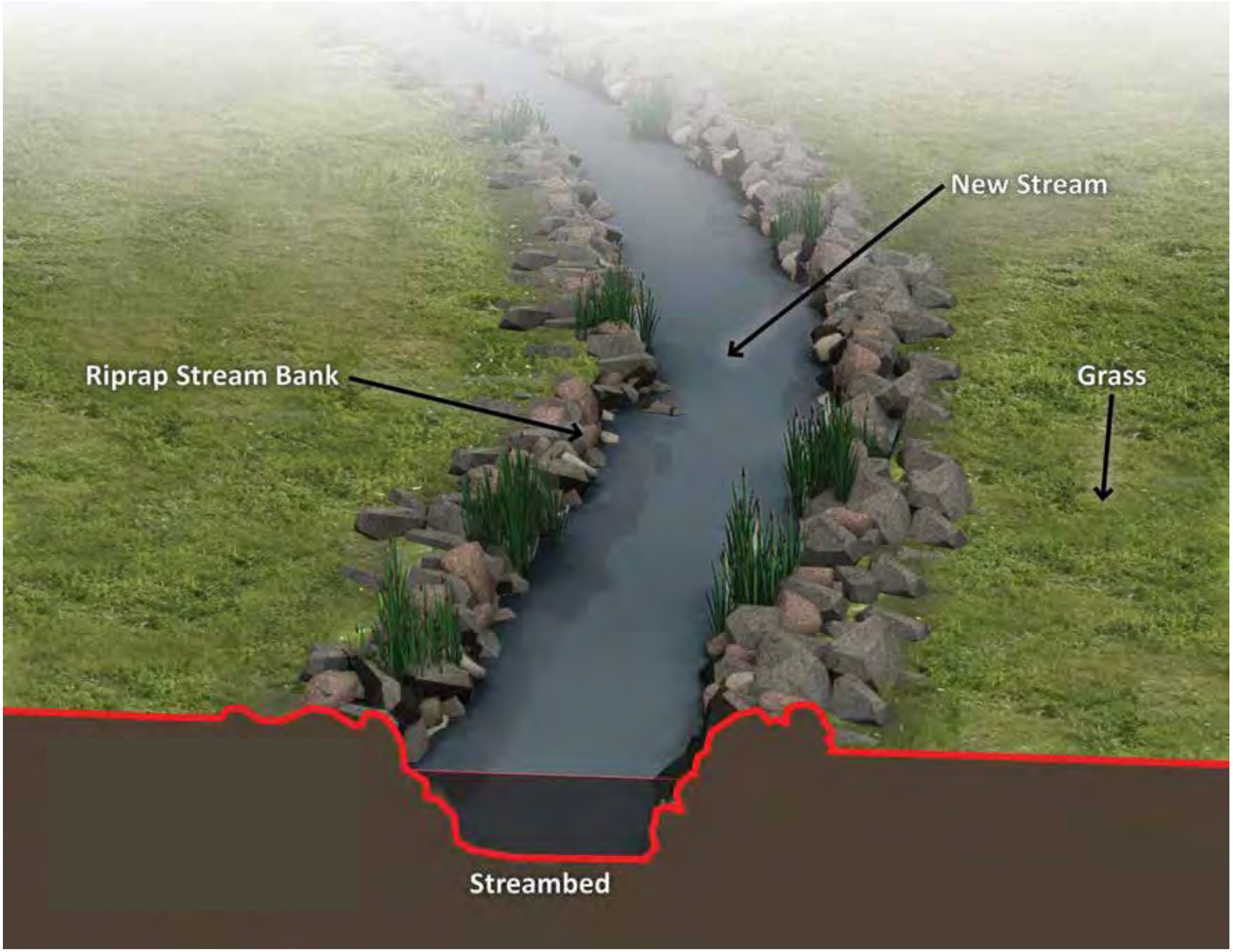
FIGURE 11-3



EHS Support
consider it done

CONCEPTUAL LOOK AT MITIGATED WETLANDS COMPLEX
DYNO NOBEL SITE
PORT EWEN, NEW YORK

FIGURE
11-4



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TYPICAL SECTION OF NEW STREAM
DYNO NOBEL SITE
PORT EWEN, NEW YORK

FIGURE 11-5