
**WESTERN WETLAND SUPPLEMENTAL SEDIMENT
INVESTIGATION REPORT FOR THE YORK OIL
SUPERFUND SITE**

Submitted to:

United States Environmental Protection Agency, Region II
New York, NY

Submitted by:

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INTRODUCTION

Additional field and laboratory work has been conducted to determine the extent of remediation to be conducted within the Western Wetland at the York Oil Superfund Site. This additional work was needed based on the remedy specified in the EPA's September 1998 Superfund Record of Decision for Operable Unit No. 2 (OU-2) at the site.

The site is located in northern New York State one mile northwest of Moira, NY in western Franklin County. OU-2 consists of the potential contamination pathways emanating from the site proper (i.e. OU-1). One of the OU-2 areas is called the Western Wetland which consists of a beaver pond and the fringes of the pond. The Western Wetland is located adjacent to and downstream (west) of the westernmost portion of OU-1. Figure 1 shows the portion of OU-2 called the Western Wetland in relation to the westernmost portion of OU-1.

The remedy for the Western Wetland includes excavating sediment from the southeastern portion of the Western Wetland (referred to in the feasibility study for OU-2 as Zone 1 - Minimum Extent) and from the stream bed downgradient of the beaver pond to North Lawrence Road (referred to as Zone 2). A 1 ppm PCB sediment cleanup goal has been established for this site within the Record of Decision for OU-2. A lead cleanup goal has not been established, however the State of New York has suggested looking at a lead concentration of 31 ppm based on a lowest effect level for lead available from Persaud et. al., 1992. The full depth of contaminated sediment in these two zones (up to approximately 18 inches below the top of sediment) will be excavated. The need for additional excavation within the remainder of the Western Wetland is, in accordance with the OU-2 September 1998 Record of Decision, subject to design-phase studies. These studies include sediment sampling to characterize the extent of PCBs and lead outside Zone 1 - Minimum Extent and, as needed, additional design-phase studies to determine whether lead and/or PCBs in the sediment pose an ecological threat. This report provides results from the design-phase sediment sampling.

Excavated OU-2 sediments will be consolidated with materials to be excavated as part of the OU-1 remedy, treated through onsite solidification/stabilization, and placed and capped in accordance with the OU-1 Consent Decree, the ongoing OU-1 remedial design, and the OU-2 Record of Decision. Wetland areas impacted through OU-2 construction activities will be restored to the extent practicable and as appropriate in

accordance with input received from the State of New York Department of Environmental Conservation and the U.S. Army Corps of Engineers.

Work summarized in this brief report was conducted in accordance with the draft Statement of Work for OU-2 (EPA, November 1998). This work also corresponds to work described in Subtask 2.1.1 from the Work Plan for Western Wetland Predesign Investigation (Parsons ES, September 1998).

OBJECTIVE AND WORK SCOPE

The objective of this sediment investigation work is to provide the additional characterization data needed to specify the need for and extent of the remedy for Zone 1 - Maximum Extent. The scope of work conducted was in accordance with the September 1998 Work Plan for Western Wetland Predesign Investigation work and was as follows:

- Sediment samples were collected from October 26 through October 29, 1998 at 35 locations and six-inch vertical intervals within Zone 1 - Maximum Extent. Locations within the beaver pond were accessed by canoe to minimize disturbance of the pond bottom. Samples were collected vertically from each location to refusal. Sediment thickness ranged from six to 26 inches below the sediment-water interface. Samples were collected based on 100-foot centers (see Figure 2) by pushing a lexane tube fitted with an egg-shell sample catcher into the sediments to refusal. A sediment core from each location was separated into the shallow (0-to 6-inch), intermediate (6- to 12-inch), and deep (12- to 18-inch) samples and placed in corresponding stainless steel bowls for homogenization. Excess water was drained from the each sample prior to the sample being homogenized. Staked sample locations were subsequently surveyed for horizontal control.
- Each of the 35 sediment samples from the top six inches of sediment was submitted for analysis. In addition, 13 of the 35 samples from the 6 to 12-inch depth (intermediate) interval, and an additional six of 35 samples from the 12 to 18-inch depth (deep) interval were analyzed. Selection of the locations for analyses of intermediate and deep samples followed random number procedures outlined in Appendix C of the OU-1 Predesign Work Plan for generating sample numbers for laboratory analyses in a random manner. Some of the intermediate and deep samples designated in the work plan for analysis had to be changed in the field based on sample availability (e.g. no deep sediment was available at locations 1, 6, 10, 13, 24, 30, and 33). All of the samples that were analyzed were analyzed for polychlorinated biphenyls (PCBs) and lead.

- In addition, 13 different sediment samples were analyzed for total organic carbon (TOC). Also, particle size was evaluated qualitatively in the field for each sample by a Parsons ES geologist as presented on Table 1.
- Samples were analyzed by Galson Laboratories (East Syracuse, NY) for PCBs and lead and by H2M Laboratories (Melville, NY) for TOC using the same standard methods and protocols for lead and PCBs used during the OU-1 Predesign Investigation. The TOC analyses were done using the Lloyd-Kahn method which is consistent with previous TOC analyses of site media. Analyses were subsequently validated by Data Validation Services (North Creek, NY) using EPA Region II standard operating procedures for data validation. The "J" qualifier was added to most of the laboratory results because of the high water content of the samples.
- PCB and lead results are presented in Table 2 and on Figures 2 through 4. The PCB and lead data were not kriged in accordance with the Government's comments on the September 1998 work plan. TOC data are also included in Table 2.

SAMPLE RESULTS

Important observations from the Western Wetland Supplemental Sediment Investigation results presented in Table 2 and Figures 2 through 4 are as follows:

- PCBs were detected in sediment at 14 of the 35 surface sediment locations sampled at concentrations greater than one part per million (ppm) on a dry weight basis. Nine of the 35 surface sediment samples analyzed showed PCB concentrations above 10 ppm with the highest detection of PCBs being 72 ppm at SED-12S. Where PCBs were detected and a deeper sediment sample was analyzed, PCB concentrations in the deeper sample(s) were lower than concentrations in the surface sample.
- Locations with PCB concentrations greater than 1 ppm in sediment are shown on Figure 2 to encompass a band approximately 200 feet wide along the flow length of the beaver pond.
- Concentrations of lead in sediment detected ranged from 3.7 ppm at SED-22D to 5,380 ppm at SED-18S on a dry weight basis. The highest lead concentrations were found at locations with PCBs above 1 ppm.
- At locations with sediment containing less than 1 ppm PCBs, the highest lead concentration detected in the sediment was 147 ppm at SED-07S. A total of seven samples at six different locations adjacent to Zone 1 - Minimum Extent showed PCB concentrations less than 1 ppm and lead concentrations greater than

31 ppm. At one of these six locations, PCBs were greater than 1 ppm in a shallower sample. The other five locations showing PCBs less than 1 ppm and lead greater than 31 ppm (i.e., SED-03 and SED-07 west of Zone 1 - Minimum Extent and SED-19, SED-24, and SED-30 north of Zone 1 - Minimum Extent) are highlighted in Figure 2 along with the area containing over 1 ppm PCBs. Lead concentrations in the deeper sample(s) were, like PCBs, lower than concentrations in the shallow sample from the same location.

- The correlation between PCB and lead concentrations in the sediment samples analyzed showed increasing lead with increasing PCB concentrations and a correlation coefficient (R squared) equal to 0.47.
- Total organic carbon concentrations in the sediment from the 13 samples analyzed for TOC ranged from 0.56 percent at SED-20I to 48.5 percent at SED-22S. Nine of the 13 TOC levels were above 10 percent.
- Results from this design-phase investigation effort do not show any evidence that the PCBs were channelized within the beaver pond. This observation is consistent with unsuccessful attempts in the Fall of 1996 during the York Oil OU-1 pre-design investigation to physically locate a submerged channel along cross sections within the beaver pond. The PCBs and lead have migrated to the beaver dam at the downstream end of the beaver pond apparently along a transport path that is approximately half the width of the pond.
- Results from previous sediment sampling efforts within the Western Wetland are generally consistent with the results presented herein. The only exception is a result from one previous sample collected as part of the original remedial investigation work done at the site in the 1980s. This one sample showed 2 ppm total PCBs outside the pond's northern end at sample location Z2-T3-3 approximately 200 feet east of the beaver dam. As sediment in the Western Wetland is remediated, this location will be checked and if PCB concentrations in sediment from that location and its vicinity are above 1 ppm, then sediment in that area would be removed.

RECOMMENDATIONS

Based on results from work described herein, additional design-phase field investigation work within the Western Wetland does not appear to be warranted. Rather, additional sediment beyond the area showing PCBs greater than 1 ppm in sediment is recommended to be removed to include sediment with a lead concentration of 31 ppm or higher. PCBs and lead are the two parameters to address in accordance with the Record of Decision for Operable Unit No. 2. All of the locations outside Zone 1 - Minimum Extent with PCBs over 1 ppm and lead over 31 ppm can be addressed by draining the pond temporarily and removing in as dry a condition as possible the sediment within the

highlighted portion of the Western Wetland shown in Figure 2. This additional removal of sediment amounts to approximately 5,000 cubic yards of sediment based on an average sediment depth of 15 inches within the portion of the Western Wetland where sediment removal is proposed. This additional 5,000 cubic yards of sediment does not include the 3,700 cubic yards estimated from Zone 1 - Minimum Extent based on an average sediment depth and area within Zone 1 - Minimum Extent of 18 inches and 1.5 acres respectively. These average sediment depths and acreage are based on output from this Supplemental Investigation.

The objective of any additional design-phase studies within the Western Wetland that have not been conducted to date would be to help determine whether the PCBs and lead in areas outside the area to be excavated pose an ecological threat. However, the toxicity literature and the State of New York have identified 31 ppm lead as a concentration goal that represents low-level impacts of lead in freshwater sediment. While the York Oil PRPs do not necessarily support use of a 31 ppm lead concentration in sediment as a cleanup goal, it is both timely and cost effective to remove some additional sediment within the Western Wetland to meet the 31 ppm lead concentration rather than conduct additional studies that could delay remediation of the Western Wetland another year.

The resulting remediation would remove over 99 percent of the PCBs and 99 percent of the lead in the Western Wetland based on available analytical sediment data.

TABLE 1
SEDIMENT FIELD OBSERVATIONS

<u>SEDIMENT SAMPLE ID</u>	<u>TOTAL SEDIMENT DEPTH (inches)</u>	<u>SEDIMENT CHARACTERIZATION</u>
SED - 01	12	Medium to coarse sand, some organic silt
SED - 02	11	Brown organic silt with some sand
SED - 03	20	Medium sand to 14 inches over brown organic silt to 20 inches
SED - 04	26	Medium sand with little gravel to 18" over brown organic silt to 26"
SED - 05	6	Brown organic silt, with little sand
SED - 06	9	Dark brown organics to 6 inches, over organic dark brown silt from 6 to 9 inches
SED - 07	12	Light organic to 6 inches over peat from 6 to 8 inches over soft organic silt with little clay from 8 to 12 inches
SED - 08	12	Organic to 6.5 inches over organic silt with little clay to 12 inches
SED - 09	9	Dark brown organic silt with little clay and trace sand to 7 inches over medium tan sand from 7 to 9 inches--
SED - 10	11	Brown organic to 5 inches over organic silt with little clay from 5 to 11 inches
SED - 11	15	Dark brown organic to 6 inches over peaty organic silt from 6 to 14 inches over a gray fine sand lense
SED - 12	14	Dark brown organics and woody to 6 inches over same as above grading to organic silt with peat
SED - 13	9	Brown organics and woody to 6 inches over same as above grading to organic silt and peaty with little clay
SED - 14	18	Dark brown organic silt to 6 inches over tan fine sane with little coarse sand and gravel to 18 inches
SED - 15	13	Brown organic over brown organic silt with little clay and peat
SED - 16	14	Brown organics, woody to 8 inches over graded to organic silt with some peat to 13 inches over fine gray sand
SED - 17	19	Woody organic material to 12 inches over organic silt with some clay and peat lenses to 18 inches over gray fine sand. Slight oily odor.

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TABLE 1 (CONTINUED)
SEDIMENT FIELD OBSERVATIONS

<u>SEDIMENT SAMPLE ID</u>	<u>TOTAL SEDIMENT DEPTH (inches)</u>	<u>SEDIMENT CHARACTERIZATION</u>
SED - 18	15	Woody organic to 12 inches over graded to organic silt with little clay to 14 inches over gray fine sand. Oily odor to 14 inches.
SED - 19	8	Woody dark brown organics
SED - 20	12	Brown organic fine sand to 9 inches over medium tan sand
SED - 21	10	Dark brown organic silt to 7 inches over organic silt with little clay to 9 inches over gray fine sand
SED - 22	14	Brown organic and woody to 11 inches over brown organic silt to 13 inches over gray fine sand with little clay
SED - 23	19	Leafy organics to 6 inches over organic silt, woody, little clay to 18 inches over gray silt with little clay
SED - 24	11	Dark brown organic silt and little woody to 8 inches over gray silt - very fine sand with little clay
SED - 25	14	Gray sand with dark brown organic silt and roots
SED - 26	15 (approx.)	Brown organic silt with little clay to 6 inches over tan silty clay
SED - 27	6	Dark brown organic silt with little coarse sand and gravel
SED - 28	8	Dark brown organic silt with trace fine sand and roots
SED - 29	9	Brown woody organics to 6 inches over brown organic silt with little wood to 8 inches over gray fine to medium sand
SED - 30	12	Brown organics to 6 inches over brown organic silt with trace roots
SED - 31	14	Brown organic silt
SED - 32	15	Brown organics to 8 inches over brown organic silt with peat and woody lenses
SED - 33	11	Dark brown organics grading to organic silt with some woody material to 10 inches over gray fine sand with some clay
SED - 34	18	Dark brown organic silt
SED - 35	12	Brown organic silt with roots to 11 inches over gray sand with little clay

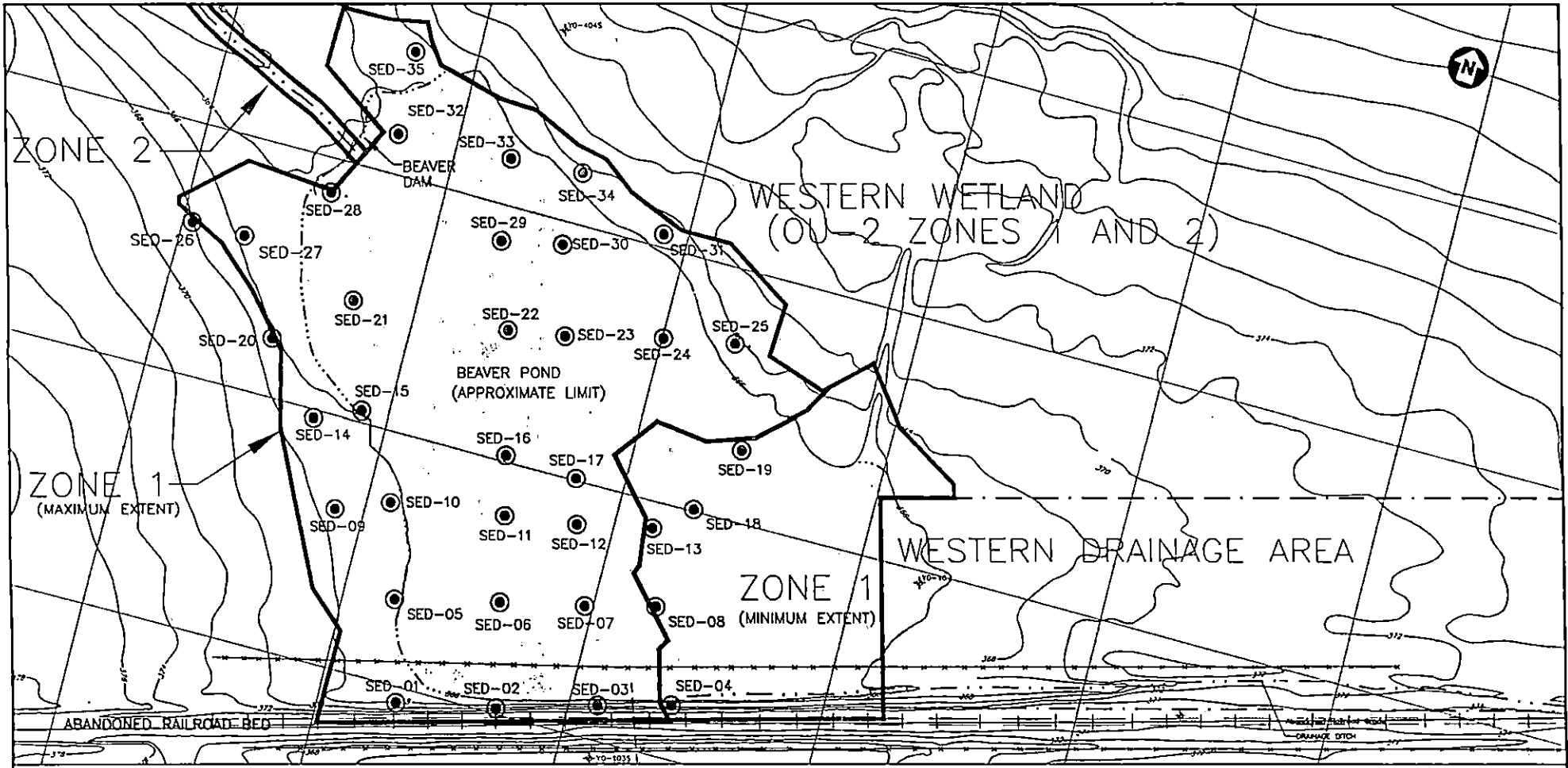
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TABLE 2
OU-2 WESTERN WETLAND SEDIMENT INVESTIGATION
ANALYTICAL SAMPLES BY LOCATION
BASED ON VALIDATED RESULTS

Sample Id	Total PCBs (mg/Kg)	Lead (mg/Kg)	TOC (%)
SED-01S	<0.043 J	19.1 J	
SED-02S	<0.034 J	14.8 J	18.9 J
SED-102S	<0.035	14.4 J	
SED-03S	<0.082 J	58.4 J	
SED-03D	<0.038 J	7.8 J	
SED-04S	<0.024	8.5	
SED-04I	<0.021	7	2.74 J
SED-05S	<0.028	17.7	
SED-06S	<0.082 J	13.1 J	
SED-07S	<0.59 J	147 J	
SED-07I	<0.071 J	9 J	32.5 J
SED-08S	1.39 J	534 J	
SED-09S	<0.039 J	16.6 J	
SED-10S	<0.051 J	24.5 J	20.5 J
SED-10I	<0.030	11.2	
SED-11S	2.2 J	271 J	
SED-11I	<0.094 J	94.7 J	
SED-11D	<0.040 J	9.4 J	
SED-12S	72 J	2730 J	
SED-13S	30 J	3080 J	
SED-13I	23.5 J	405 J	
SED-14S	<0.03	20 J	
SED-114S	<0.032	20.5 J	
SED-14D	<0.022	7 J	1.75 J
SED-15S	<0.044 J	21.5 J	
SED-16S	12.1 J	993 J	
SED-17S	17.8 J	982 J	
SED-18S	29 J	5380 J	45.4 J
SED-18I	4.2 J	940 J	

Sample Id	Total PCBs (mg/Kg)	Lead (mg/Kg)	TOC (%)
SED-19S	<0.12 J	82.2 J	
SED-20S	<0.028	12.1 J	
SED-20I	<0.02	3.8 J	0.56 J
SED-21S	<0.072 J	23.6 J	
SED-21I	<0.043 J	17.4 J	
SED-22S	28.6 J	1150 J	48.5 J
SED-22D	<0.028	3.7 J	
SED-23S	6.5 J	2040 J	
SED-23I	1.79 J	131 J	
SED-23D	<0.083 J	20 J	
SED-24S	<0.091 J	32.5 J	40.1 J
SED-25S	<0.033	11.5 J	
SED-26S	<0.026	17.3 J	7.86 J
SED-26D	<0.02	8.2 J	
SED-27S	<0.028	14.8 J	
SED-28S	<0.032	10.8	
SED-29S	15.1 J	585 J	
SED-29I	<0.042 J	4.2 J	16.9 J
SED-30S	<0.22 J	71 J	
SED-30I	<0.095 J	38.1 J	25.5 J
SED-31S	<0.031	10.3	
SED-131S	<0.03	9.8	
SED-32S	39 J	361 J	
SED-33S	<0.069 J	20.2 J	
SED-33I	<0.029	7.3	11.2 J
SED-34S	<0.038 J	13.6 J	
SED-35S	<0.04 J	15.5 J	
SED-35I	<0.034 J	6 J	

- Note:
- (1) All results are reported on a dry weight basis.
 - (2) PCB aroclors detected were Aroclors 1248 and 1260.
 - (3) SED-102-S is a duplicate of SED-02S.
SED-114S is a duplicate of SED-14S.
SED-131S is a duplicate of SED-31S.
 - (4) J - estimated value
 - (5) Numbers following less than signs (<) are the highest reporting limits for individual aroclors.
 - (6) A blank entry indicates no sample was analyzed.



LEGEND

- x—x—x—x— EXISTING FENCE
- +—+—+—+— ABANDONED RAILROAD TRACK
- · · · · · — DRAINAGE DITCH
- · · · · · — POND SHORELINE (APPROX.)
- · · · · · — OU-1 BOUNDARY
- ⊙ SINGLE MONITORING WELL
- ⊙ SED-09 1998 SEDIMENT SAMPLING LOCATIONS
- POND AREA



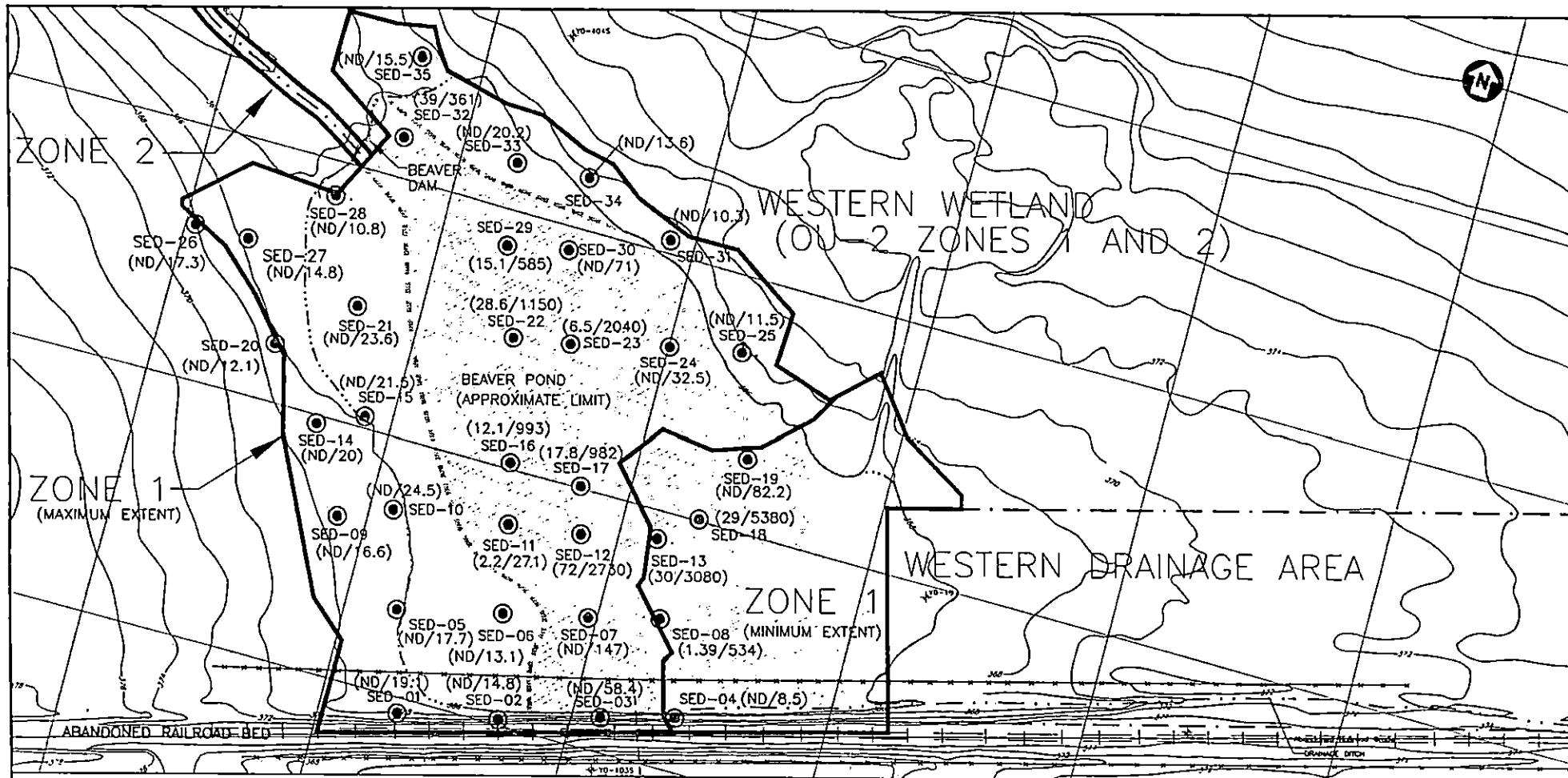
FIGURE 1

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

YORK OIL SUPERFUND SITE
OU-2 ZONES 1 AND 2

PARSONS SNODGRASS SCIENCE, INC.
DESIGN • RESEARCH • PLANNING
200 BLVD. STATE ST. SUITE 211 BOSTON, MA 02116
617-552-1000 FAX 617-552-1001

DATE: 12/14/98 (JHG)
 FILE: P:\725129\CAD\725129C11.DWG
 SCALE: PAPER SCALE, 1=100
 XREF'S: NONE



LEGEND

- x-x-x- EXISTING FENCE
- ≡≡≡≡≡≡ ABANDONED RAILROAD TRACK
- - - - - DRAINAGE DITCH
- · - · - · - POND SHORELINE (APPROX.)
- - - - - OU-1 BOUNDARY

● SINGLE MONITORING WELL

● SED-09 1998 SEDIMENT SAMPLING LOCATIONS (29/5380) (PCBs IN PPM/LEAD-Pb IN PPM)

ND NONE DETECTED

ZONE 1 AREA WITH OVER 1 PPM PCBs AND/OR OVER 31 PPM READ.



DATE: 12/14/98 (JHG)
 FILE: P:\228129\CAD\28129C11.DWG
 SCALE: PAPER SCALE, 1=100
 XREF'S NONE

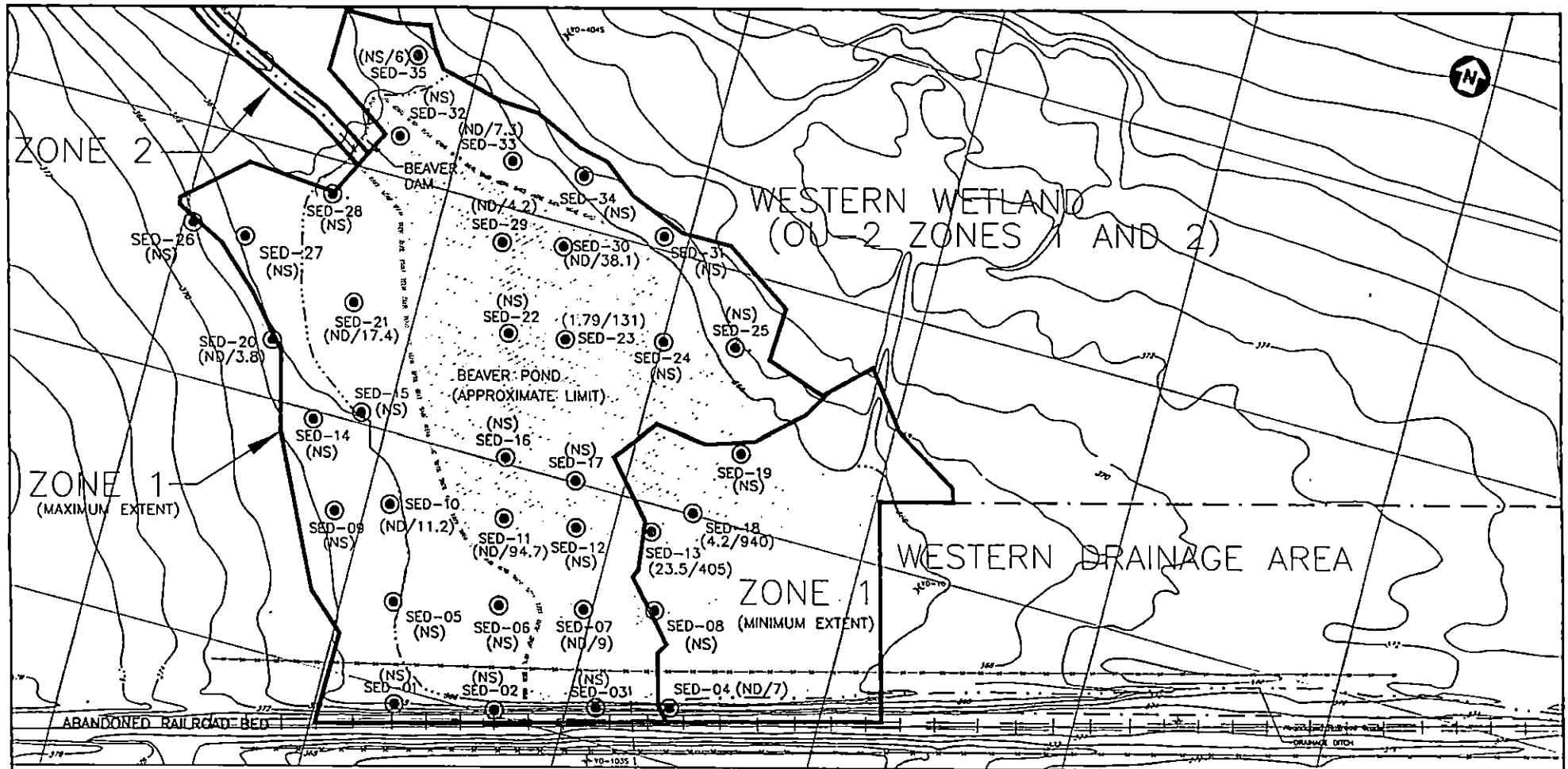
NOTE: SHALLOW SEDIMENT IS FROM 0-6 INCHES BELOW THE WATER-SEDIMENT INTERFACE.

FIGURE 2

ALUMINUM COMPANY OF AMERICA
 MASSENA OPERATIONS

1998 SHALLOW SEDIMENT
 ANALYTICAL RESULTS

PARSONS ENGINEERING AND SCIENCE, INC.
 DESIGN • RESEARCH • PLANNING
 390 ALABAMA AVE. SUITE 211 UPTOWN, N.W. ATLANTA, GA 30303-4000
 (404) 521-8000 FAX (404) 521-8001



LEGEND

- x — x — x — x — EXISTING FENCE
- + — + — + — + — ABANDONED RAILROAD TRACK
- · · · · · — DRAINAGE DITCH
- · · · · · — POND SHORELINE (APPROX.)
- · · · · · — OU-1 BOUNDARY



● SED-09 1998 SEDIMENT SAMPLING LOCATIONS
(1.79/131) (PCBs IN PPM/LEAD-Pb IN PPM)

ND NONE DETECTED
NS NO INTERMEDIATE SAMPLE

— · · · · · — ZONE 1 AREA WITH OVER 1 PPM PCBs AND/OR OVER 31 PPM READ.



SCALE

FIGURE 3

ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS

1998 INTERMEDIATE SEDIMENT
ANALYTICAL RESULTS

PARSONS ENGINEERING SCIENCE, INC.
DESIGN • RESEARCH • PLANNING
300 BROAD STREET • SUITE 201 • BOSTON, MA 02109 • TEL: 617-267-0000
FAX: 617-267-0001

DATE: 12/14/98 (LHG)
FILE: P:\728120\CAD\28129C11.DWG
SCALE: PAPER SCALE, 1=100
REF'S: NONE

NOTE: INTERMEDIATE SEDIMENT IS FROM 6 TO 12 INCHES BELOW THE WATER-SEDIMENT INTERFACE.

